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Assessing Potential Welfare Impacts on Agriculture of a Regional Free Trade Agreement in Southern Africa

Alejandro Nin-Pratt, Xinshen Diao and Yonas Bahta

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For more information, contact:
Subregional Coordinator
Regional Strategic Analysis and Knowledge Support System, Southern Africa (ReSAKSS-SA)
Private Bag X813
Silverton 0127
Pretoria, South Africa
Telephone: +27 (0)12 845 9100
Facsimile: +27 (0)12 845 9110
E-mail: resakss-sa@cgiar.org
Website: www.sa.resakss.org

The authors

Alejandro Nin-Pratt is a Research Fellow and Xinshen Diao is Senior Research Fellow of IFPRI's Development Strategy and Governance Division, Yonas Bahta is a Post Doctoral Fellow in Agricultural Economics of IWMI-Southern Africa.

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Abstract

We develop a detailed trade analysis to assess the potential welfare impacts of a free trade agreement (FTA) on the agricultural sector of southern African countries and to determine opportunities and challenges faced by the region as a consequence of the agreement. Our approach combines an in-depth look at current trading patterns of southern African countries with the application of a partial equilibrium analysis using bilateral trade data at the four-digit standard international trade classification (SITC) level for 193 agricultural industries in 14 southern African countries. Low diversification of agricultural exports in most southern African countries seems to be a major constraint for promoting regional trade. Overall welfare effects of a FTA would be positive but small in most countries. Inefficient agricultural producers with a regional comparative advantage for agriculture would benefit from trade creation with the rest of the world. Welfare results for regional importers would be negative because of increased imports from inefficient regional producers. These results suggest that the region should be looking at regional policies and interventions beyond trade arrangements, such as those targeting investment, agricultural productivity and diversification to enhance benefits of regional trade liberalization.

Assessing Potential Welfare Impacts on Agriculture of a Regional Free Trade Agreement in Southern Africa

Alejandro Nin-Pratt, Xinshen Diao and Yonas Bahta[1]

1. Introduction

The origins of regional integration within southern Africa can be traced back to the formation of the Southern African Customs Union (SACU)[1] late in the nineteenth century, but in the last two decades the region has witnessed a growing number of regional cooperation and integration initiatives. Agreements such as the SADCC (Southern Africa Development Coordination Conference) were largely focused on reducing dependence on first-world countries and apartheid South Africa. The Southern African Development Community (SADC), which superseded the SADCC, was formed in 1992 and currently consists of 14 member countries[2]. A new economic environment has emerged within SADC with the adoption of the protocol on trade in 1996 and its implementation, which started in 2000 and aims to establish a free trade area (FTA) by 2008 with full liberalisation of trade expected by 2012. According to the agreed tariff phase-down schedules, 85 per cent of all product lines should be trading at zero tariffs by 2008. The remaining 15 per cent, constituting sensitive products, will have tariff barriers removed from 2008 to 2012. The tariff phase-down was done on a step-by-step basis with each schedule taking effect every January since 2001. As of January 2008 the 85 per cent target is deemed effective. For the SADC, the FTA is a step towards higher levels of economic integration, which are to be achieved on an incremental basis leading to a customs union in 2010, a common market in 2015 and a monetary union in 2018 (SARDC 2008).

It should be noted that most of the SADC countries have undertaken substantial trade policy reforms since the mid-1980s in line with market liberalisation policies and regional integration initiatives. Before that, most of the countries, including South Africa, had adopted inward development strategies and interventionist / protectionist trade policies. In Namibia, for example, the government has privatised support services such as tractor and seed provision and agricultural boards no longer set prices or procure agricultural products. Tanzania, Zambia and Malawi have liberalised their exchange rates, decontrolled pricing systems and abolished price setting by agricultural boards. Quantitative restrictions, specific duties, import and export permits, surcharges and other regulations have since been eliminated. Many of the major government parastatals, including crop and marketing boards, have been privatised and other market reforms have been implemented. Most governments have reduced trade-restricting practices in both tariff and nontariff areas as part of comprehensive economic reform programmes. The trend has been for governments to withdraw from direct involvement in agricultural production, marketing and distribution activities.[3]

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[1]1SACU member countries are: Botswana, Lesotho, Namibia, South Africa and Swaziland.

[2]Alejandro Nin-Pratt is a Research Fellow and Xinshen Diao is Senior Research Fellow of IFPRI's Development Strategy and Governance Division, Yonas Bahta is a Post Doctoral Fellow in Agricultural Economics of IWMI-Southern Africa.

[3]Member countries are: Angola, Botswana, the Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe representing a total population of approximately 200 million people and covering an area of 9.2 million square kilometres. Angola and the DRC are currently not applying the trade protocol (SARDC 2008).

[4] For references and a discussion of some of these policy changes, see Nin-Pratt and Yu (2008).

As a result of these policy changes, trade between SADC member countries has seen a significant expansion during the 1990s and early 2000s. While total agricultural exports from the region expanded at a rate of 7.5 per cent a year, exports from southern African countries to the region grew at a rate of 13 per cent a year between 1990 and 1999 resulting in the region increasing its share as a destination for agricultural commodities from southern African countries from 7 per cent in 1990 to 12 per cent in 1999. More than 70 per cent of this export expansion is explained by increased exports from the SACU countries, while Mozambique, Zimbabwe and Zambia together accounted for the remaining 30 per cent. On the import side, SACU countries only account for 8 per cent of growth. Mozambique, Zimbabwe, Zambia and Angola account for almost 80 per cent of the increase in imports.

Current trade policies envisage transforming the economies of the SADC countries to become more competitive through export-led growth. Countries aim to harmonise their trade policies in line with the SADC protocol on trade, and other regional and international trade agreements. Regional and multilateral trade agreements have also thrown up new trade partners. The reforms that SADC member countries have accomplished to improve trade regimes have been supported by the implementation of multilateral, regional and bilateral trade agreements. The driving force behind the engagement of these countries in trade agreements has been to secure an improvement in market access for exports and attain efficiency in sourcing imports (ESRF 2003).

Since most SADC economies are predominantly agriculture-based, and food dominates agricultural trade among the SADC countries, enhanced trade in agricultural products potentially provides a tool for fighting poverty in the region, promoting integration and increasing economic growth and welfare (ESRF 2003). SADC countries differ geographically, economically and in their levels of development. Some such as Tanzania, Mozambique, the DRC, Angola, Namibia and South Africa have ports, while others like Malawi, Zambia, Zimbabwe and Botswana are landlocked. Weather and climatic conditions are not uniform in the region resulting in the production of different crops and differences in cropping patterns, which indicate the different levels of vulnerability of SADC countries to food crisis. Some countries like Namibia, Botswana, Zimbabwe and Zambia are prone to persistent drought (ESRF 2003). Countries like Botswana and Namibia have relatively limited arable land with comparative advantages for livestock production and disadvantages for crop production. Tanzania and South Africa, on the other hand, are endowed with different weather conditions and abundant arable land leading to the farming of a range of different crops, while they are also well positioned to facilitate trade (for example, having sea ports and borders with many other countries). Countries such as Malawi, Zimbabwe and Zambia, also have good climatic conditions for food production. Among other things, these differences could determine and indicate potential for trade in agriculture and food products in the region.

How could a FTA in southern Africa affect regional trade in the region and, in particular, trade in agricultural products? Would SADC members benefit from regional trade liberalisation? Which countries would gain from such policy changes? Which agricultural sub-sectors have potential to increase production and expand regional trade in a FTA? Several studies in the past have looked at the impact of a FTA in southern Africa and tried to answer some of these questions. Although a number of them have shown that trade creation dominates trade diversion and that there are economic benefits to be realised from a FTA, others have repeatedly indicated limitations in southern Africa's economies that reduce the potential gains from a FTA.

Diao and Robinson (2003) show that the elimination of agricultural tariffs among SADC countries would benefit real agricultural GDP in the region, national income and agricultural output. Studies by Lewis (2001) and by Lewis, Robinson and Thierfelder (2002) using computable general equilibrium (CGE) modelling examined the impact of a FTA on SADC economies. They concluded that the gains that can be achieved through trade expansion are limited given SADC's small size relative to the global economy and the trade imbalances among its members. In a similar vein, Holden (1996) observed that South Africa has little incentive to seek preferential treatment in the region, largely because of the economic divergence between it and other countries in the region[4] and because South Africa's share of regional exports remains small relative to its exports to the rest of the world.[5] Various studies using a gravity model (Cassim 2000; Longo and Sekkat 2001; Subramanian and Tamirisa 2001) have also shown that the implementation of a FTA in SADC would have favourable effects on bilateral trade.

The heterogeneity in economic structures is cause for concern as empirical evidence shows that usually countries with relatively similar levels of economic development have the most success in integrating (the EU is an example). Holden also finds that regional trading blocs such as SADC encourage import substitution industrialisation and he suggests that South Africa's participation in a FTA would lead to trade diversion. Studies have also argued that the limited role that a FTA could play in the region results from the fact that tariffs are not the only obstacle to increased regional trade. To explain low trade in southern Africa several studies have stressed the importance of transport and transaction costs, inadequate infrastructure, lack of diversification in sources of comparative advantage and underdeveloped production structures (see for example, Cassim 2000; Chauvin and Gaulier 2002; Davies 1996; Geda and Kibret 2002; Goldstein 2004; Holden 1996; Jenkins, Leape and Thomas 2000; Longo and Sekkat 2001; Nyirabu 2004; Radelet 1997).

A study by Chauvin and Gaulier suggests that South Africa, the largest economy in the region, has comparative advantages in primary goods and that these advantages are similar to those of other SADC countries.[6] Mafusire (2002) sought to establish the potential for increasing intra-SADC trade using revealed comparative advantage (RCA) indices and examining export shares. He concluded that supply rigidities were a major constraint to export performance after economically smaller countries, such as Angola and the DRC, achieved a low ranking in terms of export shares, though they had superior comparative advantages. The paper by Luximon (2003) presents empirical evidence on the impact of regional trade agreement (RTA) membership on Mauritian exports to SADC member countries using a gravity model. The general conclusion is that regional integration has not had a statistically significant effect on Mauritian exports to the region. The paper uses trade compatibility and export similarity indices for Mauritius's major exports to show that trade patterns of countries in the region are not mutually compatible.

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[5]For example, in the 1980s average growth rates in real GDP ranged from 10% in Botswana to -0.4% in Mozambique, whilst between 1991 and 1999 growth rates ranged from 6.4% in Mozambique to -5.9% in the DRC (Chauvin and Gaulier 2002). Also, for Jenkins et al (2002) evidence indicates that the SADC region shows a pattern of divergence between its members (with the exception of SACU) over the course of 30 years, 1960–1990.

[6]For 2000-2005 South Africa's agricultural exports to the region were on average 20 per cent of its total exports

[7]Some SADC states are concerned that South Africa will benefit the most as it is the region's economic powerhouse and exports more than it imports from other SADC countries. Indeed, South Africa accounts for about two-thirds of the region's total GDP, approximately 18% of its population, one-fourth of agricultural GDP and one-half of agricultural trade (World Bank 2008). Hence, South Africa also plays an important role in regional trade and transport. Almost all the continental SADC countries depend on South Africa's railways, airports and seaports, highway and other transport facilities.

Less information can be found on the specific issue of regional integration and agriculture in southern Africa. Although a few studies such as that by Koester (1986) found potential opportunities for intra-regional trade in agricultural products such as live animals, meat, maize, vegetables, sugar, and honey, vegetable oils and animal feed, other studies have concluded that SADC countries have limited comparative advantages and that these are usually in the same types of agricultural products. Chauvin and Gaulier (2002) established that 'SADC countries had comparative advantages in products they are well endowed in and which are quite similar.' In addition, using export diversification indices they found that exports from SADC countries concentrated on a small number of products, more so than in the case of other developing countries like Chile. A study by Maasdorp (1998), focusing on trade and food security in southern Africa, concludes that regional trade can contribute substantially to improved food security. SADC as a whole has the potential to be self-sufficient in white maize and in a wide range of other food crops, and there is also considerable scope for greater intra-regional trade in grain and other food products, and for greater cross-border investment in agriculture and agro-industry.

The limited information and analysis about integration in agriculture, and the great diversity of approaches and contrasting results between some of the studies reviewed here, justifies further exploration of the impact of a FTA on agriculture in SADC. Some of the literature reviewed for this study has used mainly CGE models or gravity models based on econometric approaches to analyse the effects of trade in relatively aggregated sectors across SADC economies. Other studies have focused on disaggregated trade data at the three- or four-digit standard international trade classification (SITC) level using indices of revealed comparative advantage and diversification. Only a few have focused on agriculture. To complement these studies we develop a detailed analysis of the impact of a FTA on the agricultural sector of SADC countries combining the use of the most disaggregated bilateral trade data available and a methodology that is at the same time simple and theoretically sound. Our goal is to assess the potential welfare impacts of a FTA on the agricultural sector of southern African countries and to determine opportunities and challenges faced by the region as a consequence of the agreement.

To do this we divide the analysis into two parts. In the first part we take an in-depth look at current trading patterns at a disaggregated level (four-digit SITC level) using the most recent detailed trade data. We ask which are the most important import and export agricultural industries, and which are the main trading partners among the 14 SADC countries? These questions are very relevant for understanding the regional dynamics in SADC, as the trade structure represented by the leading trading industries is a reflection of the economic structures of the region as well as of each individual country. This first part of the study is developed in sections 2 and 3. In section 2 we characterise agricultural trade in SADC countries, and determine the top 10 agricultural export and import industries for each country. In section 3 we present information on main trading partners and characterise the structure and dynamics of SADC countries' import and export markets.

The second part of the study focuses on the potential welfare impact of a FTA in agriculture at the regional and country level. Specifically, we analyse the contribution of different agricultural industries to changes in the welfare of producers and consumers in different countries. We proceed by determining a group of sensitive industries: these are industries with potential to be traded regionally that at the same time are protected by tariffs. We then classify sensitive industries in two groups: industries facing enhanced protection and industries with reduced protection as a result of a FTA.

With industries classified in these different groups, we can determine the welfare effects of a FTA for different regions and agents. Section 4 presents the conceptual framework and methodology used for this analysis and the classification of industries in the different groups mentioned above. This methodology is then used in section 5 to evaluate the welfare impact of a FTA on agriculture. We expect that such analysis will help regional organisations and individual countries to evaluate the potential gains of a FTA and of further regional integration (for example the creation of a customs union). Section 6 summarises the findings and discusses policy implications.

2. An Anatomy of Agricultural Trade in SADC Countries

As mentioned in the introduction, our analysis starts by identifying the most important agricultural commodities traded in the region. The UN's four-digit SITC trade data,[7] classifies agricultural products or product groups into 14 chapters, including live animals (00), meat and meat preparations (01), dairy products and eggs (02), fish (03), cereals and cereal preparations (04), vegetables and fruits (05), sugar, sugar preparations and honey (06), coffee, tea, cocoa and spices (07), feed stuff for animals (08), miscellaneous edible products and preparations (09), beverages (11), tobacco and tobacco manufactures (12), raw hides, skins and fur skins (21), oil seeds and oleaginous fruits (22). We also include agriculture-related products drawn from other chapters in the analysis. Throughout this study we will refer to the four-digit categories in the SITC as 'industries' given that at this level they correspond to groups of products that can be identified at the six-digit level or higher if we were to further disaggregate our data. A detailed list of the 193 agricultural industries traded by SADC countries can be found in the appendix.

Although SADC countries as a group exported or imported products from more than a hundred agricultural industries in 2000-2005, we are interested only in major export and import industries, those industries that encompass the majority of the agricultural trade of these countries during that period. We define major agricultural export or import industries for a SADC country based on the share of the different industries in that country's total value of agricultural exports or imports. Thus, the first step in defining the main export and import products is to rank all industries exported or imported by each country according to their share in total exports or imports. Using these shares, we then select the top10 among all import and export industries for each country and each year (2000-2005).

In contrast with more aggregated trade figures, the trade value of industries defined at the 4-digit level can change dramatically between years. For a particular country some industries that appeared in the top-10 list with high shares in a one year could well disappear from the list in other years. In order not to miss some industries that could be important for a particular country but did not appear in the top-10 list in all years, we include as top-ranking industries all those that appeared in the top-10 in at least one year. For this reason, the number of industries included in the top-10 list of the 14 SADC countries for the period 2000-2005 is greater than 10. The total number of top-10 export industries for each country is presented in Table 2.1.

2.1 Which are the most important export industries?

The first column in Table 2.1 presents the total number of agricultural industries in each SADC country that exported products from 2000-2005. While the database for the world as a whole includes more than 190 industries, only one SADC country – South Africa – exported products from all these industries in that period. Two other countries, Tanzania and Zimbabwe, exported products from about 180 agricultural industries. Of the 14 countries, Angola has the least number of exporting agricultural industries, 100 in total. On average, SADC countries exported from 158 agricultural industries in this period.

[8]UN Comtrade data, http://comtrade.un.org/db/

The second column in Table 2.1 reports the number of top-10 export industries for each SADC country. Because of changes in the ranking of export industries over time from 13 to 18 industries appeared in the top-10 ranking in different countries during this period, with an average of 15 industries.

According to our figures in the third column of Table 2.1 the average share in agricultural export value of the top-10 exporting industries for the region as a whole is 88 per cent. Top-10 ranking commodities accounted for more than 80 percent of total agricultural exports in all countries, with the exception of South Africa (59.6 per cent). In nine of these countries, the top-10 commodities accounted for more than 90 per cent of the total value of agricultural exports.

The results presented so far indicate that for most SADC countries, agricultural exports are concentrated in a few industries. Such an export structure can significantly reduce the possibility of intra-regional trade among SADC countries, reducing the likelihood of matching import demand from SADC countries with the small number of industries exported by other SADC countries.

Table 2.1 Number of top-10 agricultural export industries for SADC countries, 2000-2005

	Top-10 industries			Ranking dynamics of top-10 product items					
				No change[2]		Moving up[3]		Moving down[4]	
Exporter	Total # of agricultural export industries	# of top-10 industries[1]	Share in agricultural export value	# of industries	Share in agricultural export value	# of industries	Share in agricultural export value	# of industries	Share in agricultural export value
Angola	100	13	96.5	6	74.2	4	6.2	3	16.1
Botswana	173	17	92.2	4	66.7	6	7.0	7	18.4
DRC	118	14	95.3	6	80.9	4	4.9	4	9.6
Lesotho	124	17	82.4	3	10.4	4	1.0	10	71.0
Madagascar	155	16	91.8	12	87.5	2	1.9	2	2.5
Malawi	144	15	97.7	6	91.9	4	2.7	5	3.1
Mauritius	166	15	95.3	11	93.4	2	0.7	2	1.2
Mozambique	155	16	91.3	5	60.3	5	14.9	6	16.1
Namibia	174	16	91.3	3	69.2	8	8.9	5	13.3
South Africa	193	13	59.6	8	42.4	3	11.5	2	5.7
Zimbabwe	182	18	87.3	11	80.5	3	3.0	4	3.8
Swaziland	177	16	90.0	8	80.0	4	4.2	4	5.8
Tanzania	187	13	79.4	5	53.5	4	9.0	4	16.8
Zambia	161	12	84.4	5	24.7	4	38.0	3	21.8
Average	158	15	88.2	7	65.4	4	8.1	4	14.7

Notes: 1. The number of top-10 industries is greater than 10 if industries that appeared in the top-10 list differed across years in 2000-2005.

2. The number of industries that appeared in the top-10 list for the entire period 2000–2005 and their ranking is stable, namely, there is no correlation between their ranking and a time trend.

3. The number of industries that appeared in the top-10 list and that moved up to higher ranks during the period, namely, their ranking shows a negative coefficient against a time trend (the highest rank marks as 1 and the lowest rank as 10).

4. The number of industries that appeared in the top-10 list and moved down to lower ranks during the period, namely, their ranking shows a positive coefficient against a time trend.

Source: Authors' calculation based on UN Comtrade data.

While a six-year period may not be long enough for a dynamic analysis of structural changes in agricultural exports, we can still observe certain changes during this period. We analyse the dynamics of the importance of different export and import industries for SADC countries by looking at changes in the rankings of the top-10 industries. The fourth column of Table 2.1 reports the number of industries among the top 10 that did not show a significant change of position in their ranking between 2000 and 2005[8]. The number of such industries ranges from 3 to 12 for the different countries, with an average of 7 for the region as a whole. It can be seen that industries with a stable ranking play a dominant role as they account, on average, for 65 per cent of agricultural exports in SADC countries. However, for some countries, such as Zambia, Mozambique, Tanzania, Lesotho and South Africa, the share of stable-ranking industries in total agricultural exports is below 50 per cent. The most significant change in the ranking of agricultural industries occurred in Lesotho and Zambia. In the case of Lesotho, there are only three industries with a stable ranking and together they accounted for only 10 per cent of the country's total agricultural exports in this period, while in Zambia, there are five such industries accounting for 25 per cent of total exports.

We also report the number of industries moving in the ranking of top-10 industries in columns six and eight of Table 2.1. Among the 14 SADC countries, there are two to eight industries moving up and two to 10 industries moving down in the ranking in 2000–2005. While for most countries the share of products in total agricultural exports moving up in the ranking is not large, there are countries in which significant change occurred. Again, Zambia is the country that shows the most significant changes in the industry ranking, as four industries moving up in the ranking account for 38 per cent of the country's total agricultural exports in 2000–2005. Significant change also occurred in Mozambique, where five industries moving up in the ranking account for 15 per cent of that country's total agricultural exports.

Structural change in exports is also reflected in those industries whose importance among major agricultural exports declined over time. Obviously, for the countries where we observe a relatively large share of industries moving up in the ranking, we expect to see a similar share of industries moving down in the ranking. For example in the case of Zambia, there are three industries moving down in the ranking in 2000–2005 that account for 22 per cent of total exports.

Looking at the list of top-10 exporting agricultural industries for the 14 SADC countries we found a total of 92 different agricultural export industries. Table 2.2 shows the 40 most important industries with the remaining 52 aggregated at the bottom of the table. These 92 industries account, on average, for $8 billion in exports annually, and for 73.4 per cent of total SADC agricultural exports in 2000–2005.

[9]This is measured by regressing the ranking of each industry in each country and year against a trend. A significant coefficient of the trend line is assumed to show that a particular industry is moving up or down in the ranking, depending on the sign of the coefficient.

Table 2.2 Top-10 agricultural export industries of SADC countries, 2000-2005

SITC	Description	Value (000$) (a)	Share in total (b)	Average ranking (c)	SD (d)	# of SADC countries (e)
1210	Tobacco	982,447	9.1	3	0.97	6
0311	Fish, fresh, chilled or frozen	851,416	7.8	6	1.30	8
0611	Raw sugar, beet & cane	816,640	7.5	4	0.93	9
1121	Wine of fresh grapes & grape juice	481,098	4.4	1	0.75	1
0313	Crustacea & molluscs, fresh, chilled	462,908	4.3	7	1.30	8
0511	Oranges, tangerines & clementines	454,252	4.2	5	1.01	3
0515	Grapes	414,267	3.8	5	1.69	2
0519	Fresh fruit	359,751	3.3	4	0.42	2
6318	Wood, simply shaped or worked	353,954	3.3	5	1.21	1
2631	Raw cotton	309,862	2.9	6	1.53	8
0752	Spices, exc. pepper & pimento	231,634	2.1	6	1.67	2
0514	Apples, fresh	219,008	2.0	8	0.90	1
0440	Maize	193,206	1.8	8	2.28	6
0539	Fruit & nuts, prepared or preserved	189,114	1.7	7	0.99	2
0512	Other citrus fruit	180,109	1.7	7	1.36	2
0320	Fish, in airtight containers	129,113	1.2	6	1.02	5
0111	Meat of bovine animals	123,719	1.1	5	0.93	5
0535	Fruit & vegetable juices	117,137	1.1	11	1.36	2
0711	Coffee, green or roasted	113,875	1.0	7	1.74	7
0741	Tea	100,445	0.9	6	1.14	3
2927	Cut flowers & foliage	98,369	0.9	7	1.26	4
0517	Edible nuts, fresh or dried	88,067	0.8	5	1.31	3
0990	Food preparations	78,249	0.7	7	1.76	4
2423	Saw & veneer logs non conifer	68,347	0.6	6	1.19	5
6513	Cotton yarn & thread, grey	44,158	0.4	9	1.62	3
0612	Refined sugar & other products	34,411	0.3	9	2.18	6
1123	Beer including ale, stout, porter	33,866	0.3	7	2.05	3
1110	Non alcoholic beverages	32,905	0.3	7	4.43	3
0545	Other fresh vegetables	31,877	0.3	7	1.16	2
0542	Beans, peas, lentils, dried	29,219	0.3	9	1.59	3
2433	Lumber, sawn, planed	26,704	0.2	7	1.53	4
2218	Oil seeds, oil nuts & oil kernels	24,245	0.2	10	2.19	2
2634	Cotton, carded or combed	21,221	0.2	9	3.39	2
1223	Tobacco, manufactured	18,398	0.2	7	3.49	1
6114	Leather of other bovine cattle	16,356	0.2	9	2.55	3
0814	Meat & fish meal	15,106	0.1	7	2.66	3
0012	Sheep, lambs and goats	14,926	0.1	6	1.50	1
0620	Sugar confectionery & other sugar	13,276	0.1	5	2.69	2
2929	Materials of vegetable origin	12,966	0.1	6	1.34	2
0460	Meal and flour of wheat	11,386	0.1	9	2.08	4
	Rest 52 items	168,681	2.2	9	2.56	1
	92 items total	7,966,689	73.4	-	-	-

Notes: (a) Average of all countries for the period 2000-2005; (b) Share in SADC total exports; (c) Average ranking across countries; (d) standard deviation from the average ranking; (e) Countries for which the industry is in the top-10 list.

Source: Authors' calculation based on UN Comtrade data.

2.2 Which are the most important import industries?

Table 2.3 presents the total number of agricultural import industries and the number of top-10 major import industries for SADC countries between 2000 and 2005. Unlike exports, SADC countries import products from almost all of the industries included in the data (193 industries) with only two countries, the DRC and Madagascar, in which the number of import industries is less than 180. The average number of import industries for a SADC country is 188. The number of top-10 ranking import industries is usually greater than that of top-10 export industries, averaging 18 compared to 15 in the case of exports. On the other hand, the share of the value of imports from the top-10 import industries in total agricultural imports is usually smaller than the share of the value of exports from top-10 exporting industries. There are seven countries for which the share of top-10 importing industries is less than 60 per cent of these countries' total imports, while in the case of exports, only South Africa's share of top-10 industries accounted for less than 60 per cent of agricultural exports. On average, the top-10 import industries account for 60 per cent of SADC's total agricultural imports. These results indicate that compared with exports, and with few exceptions, the import structure of SADC countries is much more diverse than their export structure.

As can be seen in Table 2.3, the structure of imports at the individual country level changed more in 2000–2005 than the structure of exports. There are only five import industries, on average, which did not change their ranking position in the six year period considered here. The products with stable ranking account for only 25 per cent of SADC total agricultural imports and in eight of the 14 countries this share accounts for less than, or close to, 20 per cent. Surprisingly, a country such as Tanzania, which shows a dynamic export structure, does not show a similar situation in its import structure. For example, the top-10 export industries with stable ranking accounted for 54 per cent of Tanzanian agricultural exports, below the average for the 14 countries. In the case of the top-10 import industries, 69 per cent of Tanzanian imports are of products in industries with stable ranking, compared to an average of 25 per cent for the 14 SADC countries.

Table 2.3 Number of top-10 agricultural import industries for SADC countries, 2000-2005

	Top-10 industries			Ranking dynamics of top-10 product items					
				No change[2]		Moving up[3]		Moving down[4]	
Exporter	Total # of agricultural import industries	# of top-10 industries[1]	Share in agricultural import value	# of industries	Share in agricultural import value	# of industries	Share in agricultural import value	# of industries	Share in agricultural import value
Angola	182	14	59.3	4	19.2	5	18.8	5	21.4
Botswana	193	19	47.1	1	0.5	7	6.2	11	40.3
DRC	177	15	69.7	5	28.4	4	19.3	6	22.0
Lesotho	189	19	47.8	2	3.2	10	13.2	7	31.4
Madagascar	174	16	80.7	8	47.1	3	9.9	5	23.7
Malawi	187	17	49.5	7	14.3	5	22.7	5	12.5
Mauritius	190	15	61.6	9	53.2	3	5.1	3	3.3
Mozambique	187	21	68.6	7	38.5	9	24.8	5	5.3
Namibia	190	21	54.3	2	6.0	8	10.5	11	37.9
South Africa	193	15	47.6	5	17.5	6	19.3	4	10.7
Zimbabwe	185	21	69.5	6	14.1	8	46.9	7	8.5
Swaziland	190	22	50.2	2	6.9	9	9.2	11	34.1
Tanzania	191	17	80.0	7	68.6	5	7.0	5	4.5
Zambia	189	15	61.6	5	34.5	6	18.9	4	8.2
Average	187	18	60.5	5	25.1	6	16.6	6	18.8

Notes: 1. The number of top-10 industries is greater than 10 if the industries that appeared in the top-10 list differed across years between 2000 and 2005.

2. The number of industries that appeared in the top-10 list for the entire period of 2000-2005 and their ranking is stable, namely, there is no correlation between their ranking and a time trend.

3. The number of industries that appeared in the top-10 list and moved up to higher ranks during the period, namely, their ranking shows a negative coefficient against a time trend (the highest rank marks as 1 and the lowest rank as 10).

4. The number of industries that appeared in the top-10 list and moved down to lower ranks during the period, namely, their ranking shows a positive coefficient against time trend.

Source: Authors' calculation based UN Comtrade data.

For the SADC region as a whole, and with only two exceptions, the number of top-10 import industries whose ranking changed in 2000–2005 is more than the number of industries with stable ranking. On average, six top-10 import industries moved up and six moved down in the ranking. The top-10 industries moving up in the ranking account for 17 per cent and the ones moving-down account for 19 per cent of the region's total agricultural imports. These results indicate that compared with exports, the structure of SADC imports is relatively more dynamic than the structure of exports. This dynamism provides an opportunity to promote intra-regional trade from the demand side.

As in the case of exports, Table 2.4 presents a list of top-10 major import industries. Although imports are relatively diverse across SADC countries, the total number of different top-10 import industries is 71, smaller than the number of top-10 export industries (92). The share of these 71 industries in total agricultural imports of SADC countries is also smaller, 56.6 per cent compared to 73.4 per cent in the case of exports. Another difference with exports is that almost all SADC countries (11–12) are major importers of cereals (rice, wheat and maize), which account for 14 per cent of SADC's total agricultural imports. Following cereals in their share of imports there are 19 industries included in the list of top-10 import industries in at least five countries. Imports of these 19 industries together account for 34 per cent of the region's total agricultural imports. Together with cereals they represent almost 50 per cent of agricultural imports in most countries.

Table 2.4 Top-10 agricultural import industries of SADC countries, 2000-2005

SITC	Description	Value (000$)	Share in total	Average ranking	SD	# of SADC countries
0422	Rice	348,310	5.5	5	1.9	12.0
0410	Wheat	316,882	5.0	5	2.7	12.0
0990	Food preparations	244,028	3.9	7	2.0	14.0
0440	Maize	219,953	3.5	6	3.2	11.0
4222	Palm oil	189,525	3.0	6	1.8	8.0
0114	Poultry	165,872	2.6	6	1.8	7.0
4212	Soya bean oil	159,151	2.5	7	2.2	9.0
6513	Cotton yarn & thread, grey, not mercerized	118,734	1.9	6	2.5	5.0
1124	Distilled alcoholic beverages	118,442	1.9	8	3.0	5.0
0460	Meal and flour of wheat	115,417	1.8	6	1.6	7.0
0813	Oil seed cake & meal	112,801	1.8	4	1.1	1.0
1210	Tobacco	105,724	1.7	7	2.6	5.0
0222	Milk & cream in solid form, blocks or powder	101,262	1.6	9	1.8	10.0
0311	Fish, fresh, chilled or frozen	98,381	1.6	6	2.9	4.0
2631	Raw cotton, other than linters	91,862	1.5	7	1.9	6.0
0611	Raw sugar, beet & cane	88,924	1.4	8	2.8	9.0
2433	Lumber, sawn, planed, etc. Non conifer	88,630	1.4	10	2.3	2.0
0612	Refined sugar & other products	88,176	1.4	7	2.7	6.0
1123	Beer including ale, stout, porter	80,660	1.3	8	2.6	3.0
0470	Meal & flour of cereals exc. wheat	75,848	1.2	7	2.4	7.0
5995	Starches, insulin, gluten	73,729	1.2	11	2.4	3.0
1110	Non alcoholic beverages	69,054	1.1	6	1.4	5.0
6512	Yarn of wool and animal hair	54,343	0.9	5	0.6	2.0
6114	Leather of other bovine cattle & equine leather	52,802	0.8	12	2.0	1.0
1121	Wine of fresh grapes including grape must	43,689	0.7	9	2.1	4.0
0111	Meat of bovine animals	40,969	0.6	6	1.2	2.0
0819	Food wastes & prepared animal feed	32,171	0.5	5	1.7	4.0
1222	Cigarettes	32,041	0.5	9	3.1	7.0
0482	Malt including malt flour	26,887	0.4	10	2.9	7.0
4216	Sunflower seed oil	21,200	0.3	9	3.6	6.0
0542	Beans, peas, lentils	21,099	0.3	8	1.9	7.0
0535	Fruit & vegetable juices	18,354	0.3	9	1.9	3.0
0134	Sausages, whether or not in airtight containers	15,224	0.2	13	2.5	1.0
0620	Sugar confectionery & other sugar preparations	14,597	0.2	10	2.7	3.0
0223	Milk & cream fresh	13,861	0.2	8	2.0	2.0
0240	Cheese and curd	11,185	0.2	11	1.7	1.0
0112	Meat of sheep & goats, fresh, chilled or frozen	10,049	0.2	12	2.0	1.0
0619	Sugars & syrups incl. art. honey & caramel	8,272	0.1	4	0.9	1.0
4313	Acid oils, fatty acids and solid residues	8,080	0.1	10	1.5	2.0
2219	Flour & meal of oil seeds, nuts, kernels, fat	7,700	0.1	9	3.1	2.0
0312	Fish, salted, dried or smoked	7,456	0.1	10	1.6	1.0
0320	Fish, in airtight containers	6,538	0.1	8	2.1	2.0
	Rest 29 items	62,170	1.0	9	3.0	1.0
	71 item total	3,580,051	56.6			

Source: Authors' calculation based on UN Comtrade data.

In summary, SADC agricultural exports are more concentrated than imports. There are ten countries for which the top-10 industries represent more than, or close to, 90 per cent of total agricultural exports. In contrast, there are only two countries, for which the top-10 industries represent 80 per cent of their agricultural imports. There is also some preliminary evidence of structural change in both exports and imports, while the import structure seems to be more dynamic than the export structure. The top-10 import industries with stable ranking account for only 27 per cent of regional agricultural imports, while in the case of exports, industries with stable ranking account for 71 per cent of regional agricultural exports. For some countries, such as Lesotho, Mozambique, Tanzania and Zambia, a significant share of agricultural exports is in industries whose ranking position in the top-10 list moved either up or down. The largest structural change in exports occurred in Zambia, where industries moving up in the top-10 ranking account for more than 50 per cent of Zambia's agricultural exports. On the import side, industries whose ranking position changed over time accounted for more than 50 per cent of imports in eight countries. Tanzania is a special case, showing high dynamism in its export structure, with a relatively stable import structure.

3. Major Agricultural Markets for SADC Countries

In this section we analyse destination and source markets for SADC's agricultural exports and imports and define the group of major partners for the region according to the share of these markets in the exports and imports of SADC countries. The importance of each market is defined as in section 2, using the share of a particular market in the total agricultural exports or imports of SADC countries. We proceed by first identifying the top-10 markets for all SADC countries. We then focus on the dynamics of these major export and import markets by identifying markets that show a significant coefficient in a regression of ranking against a trend during 2000–2005, and those with stable rankings over the same period. The results of these calculations are reported in Table 3.1.

3.1 Who are the most important markets for SADC agricultural exports?

The first column of Table 3.1 shows the number of destination markets for agricultural exports from each SADC country between 2000 and 2005. On average SADC countries have 83 trade partners who imported their agricultural products. For individual SADC countries, the number of trade partners ranks from as low as 20 for Lesotho to as high as 150 for South Africa. The second column of Table 3.1 reports for each SADC country the number of trading partners whose share of imports ranked in the top-10 list, while column three reports the aggregate share of these top-10 markets for agricultural exports from SADC countries. With two exceptions, Lesotho and Tanzania, the top-10 markets capture more than or close to 90 per cent of agricultural exports from SADC countries. Combined with findings from Table 2.1, Table 3.1 seems to indicate that SADC's agricultural exports are not only concentrated in terms of products but also in terms of markets.

We go on to look at changes in the importance of different markets for agricultural exports from SADC countries. Column four of Table 3.1 shows the number of markets whose ranking is stable over time, while column five shows their share in each country's total exports. While less than half of the importers show stable rankings during 2000–2005, most of these stable markets are the most important markets for SADC exports, as their share of agricultural exports from each SADC country is quite high. However, some countries show changes in the ranking of their export markets. For example, stable markets account for only 45 per cent of Zambian agricultural exports and 56–62 per cent for Mozambique, Swaziland and Tanzania. The six markets that move up the ranking account for 49 per cent of Zambian exports, while five similar markets account for 36 per cent of Mozambique's agricultural exports. As the export markets in Zambia and Mozambique show a significant structural change, these results seem to indicate that there is a relationship between dynamics in export markets (trading partners) and dynamics in export structure (trading commodities).

Table 3.2 presents a list of the major markets (importing countries or regions) for agricultural exports from SADC countries. The table gives details of the 13 largest markets while figures for the remaining 11 markets are aggregated in a single row. By adding the number of destination markets of all 14 countries we get a total of 210 major export destinations for the 14 SADC countries. Given that several markets repeat across the top-10 list of most countries, counting only the number of different markets, the number of top-10 markets for the region as a whole reduces to 24, 13 of them being the most important. These 13 markets account for 88.4 per cent of SADC's agricultural exports. These results indicate a high concentration of agricultural exports in a few markets. Column 5 of Table 3.2

shows similar market concentration, as the top seven trading partners are the same for exports from almost all SADC countries. As expected, the EU+EFTA is the most important market for SADC exports, accounting for 45.7 per cent of the region's agricultural exports. Encouragingly, with 18 per cent of market share, intra-regional trade is the second most important market for SADC countries. Japan, China, the United States, Canada, and the rest of SSA are also important export markets for SADC. Together they account for 18.4 per cent of total agricultural exports, a similar share to intra-regional trade.

Table 3.1 Number of top-10 agricultural export markets for SADC countries, 2000-2005

	Top-10 markets			Ranking dynamics of top-10 markets					
				No change[2]		Moving up[3]		Moving down[4]	
Exporter	Total # of agricultural export markets	# of top-10 markets[1]	Share in agricultural export value	# of markets	Share in agricultural export value	# of markets	Share in agricultural export value	# of markets	Share in agricultural export value
Angola	40	17	98.2	6	95.4	6	2.5	5	0.4
Botswana	41	15	99.8	6	99.2	2	0.6	7	0.0
DRC	54	19	99.1	7	93.1	6	5.4	6	0.6
Lesotho	20	11	78.2	3	78.1	2	0.0	6	0.1
Madagascar	105	15	97.2	9	93.2	4	3.7	2	0.3
Malawi	104	13	89.2	7	65.7	4	15.2	2	8.3
Mauritius	90	14	96.2	8	93.4	3	1.9	3	0.9
Mozambique	82	14	95.1	5	55.9	5	35.7	4	3.5
Namibia	91	14	97.9	6	90.7	5	7.0	3	0.1
South Africa	150	14	87.6	11	85.5	2	2.2	1	0.0
Zimbabwe	101	15	92.7	10	84.8	2	5.4	3	2.5
Swaziland	81	18	96.4	5	60.6	7	29.4	6	6.5
Tanzania	121	15	82.5	6	62.1	4	15.2	5	5.2
Zambia	78	16	96.0	4	45.0	6	49.1	6	1.9
Average	83	15	93.3	7	78.8	4	12.4	4	2.2

Notes: 1. The number of top-10 markets is greater than 10 if the markets that appeared in the top-10 list differed across years during 2000-2005.

2. The number of markets that appeared in the top-10 list for the entire 2000-2005 period and their ranking is stable, namely, there is no correlation between their ranking and a time trend.

3. The number of markets that appeared in the top-10 list and moved up to higher rankings during the period, namely, their ranking shows a negative coefficient against a time trend (the highest rank marks as 1 and the lowest rank as 10).

4. The number of markets that appeared in the top-10 list and moved down to lower rankings during the period, namely, their ranking shows a positive coefficient against time trend.

Source: Authors' calculation based on UN Comtrade data.

Table 3.2 Top-10 agricultural export markets of SADC countries, 2000-2005

Description	Value (000$)	Share in SADC exports	Average ranking	Standard deviation	# of SADC countries
EU15+EFTA	4,957,828	45.7	1	0.2	14
SADC	1,967,395	18.1	3	1.3	14
Japan	787,838	7.3	5	1.3	12
China	487,881	4.5	5	1.3	13
USA-Canada	384,024	3.5	6	1.4	13
Rest of SSA	339,305	3.1	6	1.8	14
South & SE Asia	146,245	1.3	9	1.8	14
Middle East	139,258	1.3	8	2.2	9
Russia	120,148	1.1	9	2.1	8
India	115,085	1.1	7	1.0	5
Australia-New Zealand	85,965	0.8	9	1.2	5
North Africa	31,930	0.3	10	2.8	6
Eastern Europe	29,700	0.3	11	2.0	9
Other 11 countries	31,492	0.3	10	1.5	1
Total 24 countries	9,624,093	88.7			

Source: Authors' calculation based on UN Comtrade data.

Table 3.3 shows the dynamics of export markets for each individual SADC country. While the countries listed in Table 3.3 are not the most important import partners for the region as a whole, their importance in SADC's agricultural exports is growing. For example, in 2000 China ranked 11th as a destination market for agricultural exports from the DRC, Namibia, Tanzania and Zambia. In 2005, China moved to fourth or fifth place in the ranking of major markets, significantly increasing its importance for these four SADC countries. A similar change is observed in the rank of the Middle East region as an import partner for Malawi, Mozambique and Tanzania. In 2000 this region ranked as the 11th most important export destination for these three SADC countries, moving to sixth or seventh place in 2005.

Table 3.3 Dynamics of selected import partners for SADC countries: Markets' rank in 2000 and 2005

Import country/region	Export country	Initial 2000	Final 2005
Russia	South Africa, Zambia	+15	11
India	Madagascar	+15	7
China	DRC, Namibia, Tanzania, Zambia	11	4-5
Australia-New Zealand	Swaziland	5-6	3
Eastern Europe	Angola, Mauritius, Namibia, Swaziland	13-14	8-9
Middle East	Malawi, Mozambique, Tanzania	11	6-7
North Africa	DRC	+15	4
South & SE Asia	Lesotho, Mozambique, Namibia, Swaziland, Zambia	5-6	4-5
USA-Canada	Madagascar	7	5

Source: Authors' calculation based on UN Comtrade data

3.2 Who are the most important exporters to SADC countries?

Table 3.4 presents a summary of the number of trade partners exporting agricultural commodities to SADC countries during 2000–2005. The table also shows the most important suppliers in the top-10 list of individual SADC countries, and presents information on the dynamic behaviour of these supply markets. The first column of Table 3.4 shows that SADC countries turn to more markets for their imports than for their exports, which is consistent with the relatively more diverse import structure presented in Table 2.3 above. An average SADC country imports from 109 countries to meet its demand for agricultural products and exports to 88 countries as shown in Table 3.1. The number of countries in the top-10 list of exporting countries to SADC is also, in general, larger than the number of top-10 countries importing from SADC. In the case of imports, 16–18 countries appear in the top-10 list as the most important sources of imports for nine SADC countries. For the remaining five SADC countries, the number of top-10 exporting countries is 12–14. For most countries, agricultural imports are concentrated in a few trading partners. In 12 SADC countries the top-10 exporting partners supplied more than, or close to, 90 per cent of total agricultural imports. The exceptions are Botswana and Tanzania. For these two countries the top-10 exporting partners supplied 77 and 81 per cent respectively of the total value of imported agricultural products.

Table 3.4 Number of top-10 markets as sources of SADC countries' agricultural imports, 2000-2005

	Top-10 markets			Ranking dynamics of top-10 markets					
				No change[2]		Moving up[3]		Moving down[4]	
Exporter	Total # of agricultural supply markets	# of top-10 markets[1]	Share in agricultural import value	# of markets	Share in agricultural import value	# of markets	Share in agricultural import value	# of markets	Share in agricultural import value
Angola	99	14	95.9	8	84.1	4	11.8	2	0.0
Botswana	70	18	76.8	2	61.6	7	13.9	9	1.3
DRC	83	14	97.0	9	90.6	2	6.4	3	0.0
Lesotho	46	16	100.0	4	7.3	8	91.6	4	1.1
Madagascar	122	14	92.8	8	75.0	3	13.6	3	4.2
Malawi	108	16	93.5	9	82.8	3	9.3	4	1.4
Mauritius	161	14	90.6	12	85.2	2	5.4	-	-
Mozambique	114	17	90.1	6	39.8	5	25.2	6	25.1
Namibia	106	17	97.6	2	39.1	9	56.0	6	2.5
South Africa	198	12	87.8	8	59.4	1	11.1	3	17.2
Zimbabwe	87	16	99.6	9	98.2	4	1.3	3	0.1
Swaziland	86	17	93.7	4	26.9	9	66.8	4	0.0
Tanzania	133	16	81.1	9	66.3	3	11.9	4	2.9
Zambia	113	16	98.8	5	82.9	7	15.3	4	0.6
Average	109	16	92.5	7	78.8	4	12.4	4	2.2

Notes: 1. The number of top-10 markets is greater than 10 if the markets that appeared in the top-10 list differed across years during 2000-2005.

2. The number of markets that appeared in the top-10 list for the period 2000-2005 and their ranking is stable, namely, there is no correlation between their ranking and the time trend.

3. The number of markets that appeared in the top-10 list and moved up to higher ranks during the period, namely, their ranking shows a negative coefficient against the time trend (the highest rank is 1 and the lowest rank is 10).

4. The number of markets that appeared in the top-10 list and moved down to lower ranks during the period, namely, their ranking shows a positive coefficient against the time trend.

Source: Authors' calculation based UN Comtrade data.

Column four of Table 3.4 shows the number of markets with a stable ranking over time. In eight countries (Angola, the DRC, Madagascar, Malawi, Mauritius, South Africa, Zimbabwe and Tanzania) more than a half of their trade partners show stable rankings over time. In the cases of Botswana and Namibia, there are only two trading partners with stable rankings. Particular market dynamics can also be observed in the export partners of Lesotho, Mozambique, Swaziland and Zambia. In the cases of Zambia and Mozambique there are only 5–6 partners with stable rankings in the top-10 list, while for Lesotho and Swaziland, there are 8–9 partners whose rankings have moved up during 2000–2005. The significant change in trading partners for these two countries has a close relationship with changes in their import structures. As shown in Table 2.3, total imports of products from industries that have moved up in the ranking over time accounted for 95 and 58 per cent of agricultural imports in Lesotho and Swaziland respectively.

As in the case of export markets, a list of imports to SADC markets from major partners is presented in Table 3.5. Of the 22 countries included in the list of major partners exporting to the region, 12 countries/regions provide 82 per cent of SADC's agricultural imports, indicating a concentration in import markets. In contrast with export markets, intra-SADC trade is the major source of agricultural imports for the region, accounting for 31 per cent of these imports into SADC countries. The EU+EFTA still plays a major role as a source of imports for the region accounting for 21 percent of SADC's agricultural imports. As in the case of export markets, most SADC countries import from a similar group of regions or countries that have the highest rankings for regional agricultural imports, another indicator of import market concentration.

Table 3.6 presents a similar analysis of the dynamics of import markets to that presented for exports in Table 3.1. Twelve countries including Brazil, Australia, New Zealand, Argentina, the United States and Canada, have risen in rank as important agricultural suppliers to SADC countries over time. The increased importance of these countries as suppliers of agricultural imports to SADC indicates that countries in the region will face strong competition from extra-regional suppliers in the event of a regional trade agreement. Some other developing countries including China and India also show growing importance as sources of agricultural imports in a few SADC countries.

Table 3.5 Top-10 agricultural import markets of SADC countries, 2000-2005

Description	Value (000$)	Share in SADC imports	Average ranking	Standard deviation	# of SADC countries
SADC	1,958,410	30.9	2	0.7	14
EU15+EFTA	1,298,874	20.5	2	0.7	14
Argentina	407,591	6.4	6	2.1	13
Brazil	320,236	5.1	8	2.2	11
India	291,840	4.6	7	2.3	13
USA-Canada	227,622	3.6	7	1.6	13
South & SE Asia	199,105	3.1	9	2.0	14
Australia-New Zealand	195,225	3.1	8	2.0	10
China	177,047	2.8	9	2.1	14
Rest of SSA	78,838	1.2	6	2.0	10
Middle East	22,706	0.4	11	2.1	8
North Africa	14,366	0.2	8	1.7	3
Other 10 countries	27,793	0.4	9	2.8	1
Total 22 countries	5,219,653	82.5	-	-	-

Source: Authors' calculation based on UN Comtrade data.

Table 3.6 Dynamics of selected export partners to SADC countries

		Rank	
Export country/region	Import country	Initial 2000	Final 2005
Brazil	Botswana, DRC, Mauritius, Mozambique, Namibia, South Africa, Swaziland	14	8
Australia-New Zealand	Mauritius	7	6
Argentina	DRC, Namibia, Swaziland, Tanzania	15	7
USA-Canada	DRC, Malawi, Swaziland, Tanzania, Zambia	7	6
China	Angola, Botswana, Zimbabwe	13	7
Seychelles	Malawi, Mauritius	16	10
South & SE Asia	Angola, Botswana , Mozambique, Namibia, Zimbabwe	7	8
Rest of SSA	Lesotho, Namibia, Zambia, Zimbabwe	12	8
Middle-East	Botswana, Malawi, Mozambique, Zambia	16	9
Japan	Namibia	16	3
India	Botswana, Lesotho, Madagascar, Namibia, Zimbabwe, Swaziland, Tanzania, Zambia	10	7
North Africa	Zambia	16	9

Source: Authors' calculation based on UN Comtrade data.

4. Assessing the Potential Impact of a Regional Integration Agreement - Conceptual Framework

4.1 Background and previous studies

The term 'regional integration agreement' (RIA) is used by Schiff and Winters (2003) 'to avoid any unsubstantiated pejorative implications and to convey that arrangements can extend well beyond international trade into areas such as investment, domestic regulation, domestic policies, standards, infrastructure and politics.' For Evans et al. (2004) RIA is a general term that refers to a whole spectrum of levels of economic integration, from the lowest level of integration represented by trade preferences, or partial scope agreements, that liberalise trade in specific commodities or sectors to the common market. For Baldwin and Venables (1995), discriminatory policy is a defining characteristic of a regional integration agreement. They distinguish three types of RIAs: a free trade agreement (FTA) is a RIA that removes tariffs among members but leaves them with autonomy to set their tariffs with non-member countries. A customs union (CU) applies a common tariff structure to trade with non-members, while a common market (CM) allows free movement of factors of production as well as goods and services between member states. Panagariya (1999) prefers to include FTAs, CUs and partial trade preferences under the denomination of preferential trade agreements (PTAs) to make explicit the discriminatory nature of these arrangements.

Baldwin and Venables (1995) classify the economic effects of a RIA in three main groups: allocation, accumulation and location effects. The analysis of allocation effects deals with changes in the static allocation of resources and the welfare changes resulting from these allocations as a consequence of RIAs. The standard analysis of potential allocation gains from RIAs derives from the Heckscher-Ohlin-Samuelson (HOS) framework of comparative advantage that explains gains from trade arising as a result of differences in factor endowments. Within this framework, the core theoretical analysis is the theory of customs unions with contributions from the theory of second best concerning what happens when one or more optimal conditions are not satisfied given that RIAs, as mentioned above, are essentially discriminatory policies (Viner 1950; Meade 1955; Kemp and Wan 1976). Under this approach, the welfare impacts of an RIA (trade creation, trade diversion and terms of trade effects) are determined by a few crucial variables: changes in commodity trade in the countries within the RIA; changes in trade between the RIA and the rest of the world; and changes in international prices facing the countries (Burfisher et al., 2003; Panagariya, 2000). When a country applies the same tariff to all nations, it will always import from the most efficient producer (lower price): trade diversion occurs when discriminatory tariff liberalisation leads a country to import from a supplier that is not the lowest cost source, thereby reducing domestic welfare. When increased trade is associated with a switch from higher-cost suppliers to lower-cost suppliers, that is, the supplier in the RIA is more efficient than the supply source before the establishment of the RIA, then the RIA is said to be 'trade creating' (Panagariya, 2000).[9]

[10]If RIAs include large countries, then the welfare results depend not only on trade flows and the creation or diversion of trade but also on changes in terms of trade. With imperfect competition, the welfare effects of a RIA maybe many times larger than in the case of perfect competition, due to production shifting, with the RIA attracting more production as a result of the increased varieties of a differentiated good being produced (Baldwin and Venables, 1995) Welfare also increases due to pro-competitive effects of the RIA when scale and cost effects are significant.

Accumulation effects refer to the growth effects of RIAs, given that they affect the return on investment (physical and human capital). Baldwin and Venables (1995) relate the accumulation effects of a RIA to 'investment diversion' and 'investment creation'. As RIAs affect factor prices in member and non-member countries, the production shifts that result from RIAs under imperfect competition will increase demand for capital in member nations and lower it in non-member nations, with additional capital generating permanent changes in output and income (Baldwin, 1989). Mechanisms for long-run growth effects arise from technological spillovers given that a RIA might promote the volume of spillovers between members - either as a consequence of increased trade volumes or because of policies designed to encourage scientific interchange. Another mechanism that could result in increased long-run growth is when RIAs affect the efficiency of sectors that produce factors like knowledge or capital goods (Baldwin and Venables, 1995).

The location effect of RIAs refers to the agglomeration and location of firms and to labour migration, which could result in increased inequality between regions. According to Baldwin and Venables (1995), under perfect competition integration is expected to equalise factor prices if the prices of goods are equalised in the integrated space. If on the other hand, firms operate under increasing returns to scale, firms will not have incentives to locate production in every country and this may widen, not reduce, factor price differences.

As a response to the wave of regionalism of the past 20 years, a solid body of work analysing the effects of RIAs has been created (Panagariya, 2000). This work has mainly focused on the analysis of static welfare effects (Panagariya, 1999) and, as a result, there is a vast literature and well developed methods to analyse these issues. Three main distinctive methodological approaches can be found in the HOS framework: revealed comparative advantage indicators (RCA); econometric evaluations; and computable general equilibrium (CGE) evaluations.

Since first being proposed by Balassa (1965) indicators of revealed comparative advantage (RCA) derived from current production and trading patterns have been used frequently to predict the sectoral effects of trade liberalisation (Barry and Hannan, 2001). The measure proposed by Balassa implies that a country's pattern of comparative advantage could be observed from post-trade data, assuming that actual trade 'reflects relative costs as well as differences in non-price factors' and is grounded in conventional trade theory. An RCA index measures a country's trade in a commodity relative to its total trade and to the corresponding export performance of a set of countries. The original index developed by Balassa referred only to exports, but several alternative options were developed to the original index. Vollrath (1991) surveys and compares alternative RCA indices discussing their main advantages and disadvantages. RCA indices and RCA-related indices have been used by the European Commission to assess the sectoral effects of the development of the single market, which in turn influenced their assessment of how the gains and losses would be distributed across member states. For example, this approach was used to assess the consequences of an expansion of EU trade with Central and Eastern Europe (CEE) (European Commission 1994). Several studies have used this approach directly or indirectly with other approaches.

The second approach is the use of ex-post econometric studies of RIAs to measure the extent of trade creation and trade diversion. Typically, this approach econometrically estimates the so-called 'gravity equation' which represents bilateral trade flows as a function of incomes and populations of trading

partners, distance between them and membership in common regional arrangements (Panagariya, 2000). As the determinants of trade between countries are clearly more complicated, gravity models generally also control for other potential influences on trade flows, such as common borders, past colonial relations, common languages, and other measures of cultural proximity and the presence of any form of preferential economic arrangements. If, when trade is regressed against a collection of such variables, the presence of a trade deal has a statistically significant effect the presumption is that the deal has in fact altered trade flows (see for example Frankel 1997)

Finally, a third approach used in the literature is to conduct ex-ante counterfactual analyses, based on partial or general equilibrium models, assuming a certain model structure, specific parameters and functional forms to represent the participating economies explicitly in the base year. The model is then shocked to simulate the preferential removal of tariffs, and welfare effects are calculated (Panagariya, 2000). According to Baldwin and Venables (1995), these models have made two contributions to the evaluation of RIAs. First, they have been used to provide estimates of the effects of actual or proposed RIAs. Second, they have also helped to understand theoretical interactions in models that are too complicated to study analytically. Baldwin and Venables also discuss the contribution of different generations of these models, mainly the ones by Deardorff and Stern (1986), Harris and Cox (1984) and Harrison, Rutherford and Tarr (1994). The study of NAFTA and the EC92 has also shown the range of possible effects that can be captured and predictions that can be generated in such models (see for example Francois and Shields 1994).

Other methods and approaches have been used to analyse the accumulation and allocation effects of RIAs. Growth regressions have been used to analyse growth models including dummies or proxies for regional integration and results tentatively suggest that some RIAs have had positive impacts on growth. For Baldwin and Venables (1995) this literature is not mature yet and new conclusions may emerge.

A new literature grouped under the term ‘new regionalism’ is putting emphasis on incorporating the impact of forces that go beyond the stimulation of efficiency gains. It observes that efficiency gains are small in relation to national product and do not suffice to explain economic growth from trade. As discussed in Burfisher et al. (2003), this body of work is more eclectic than work in the Viner-Meade frameworks and uses partial and CGE models incorporating a variety of new elements, including for example rent seeking, political economy, game theory, industrial organisation, geography, open-economy macroeconomics, and new growth theory. There is also an active literature seeking to understand the links between productivity and trade (see Burfisher et al. 2003 and Lawrence, 1996).

This study employs an ex-ante counterfactual analysis of regional trade liberalisation in SADC using a partial equilibrium approach based on the HOS conceptual framework. We found this approach to be best suited to dealing with highly disaggregated trade data as used in our study. In the rest of this section we develop the conceptual framework and the specific methodology used in our analysis.

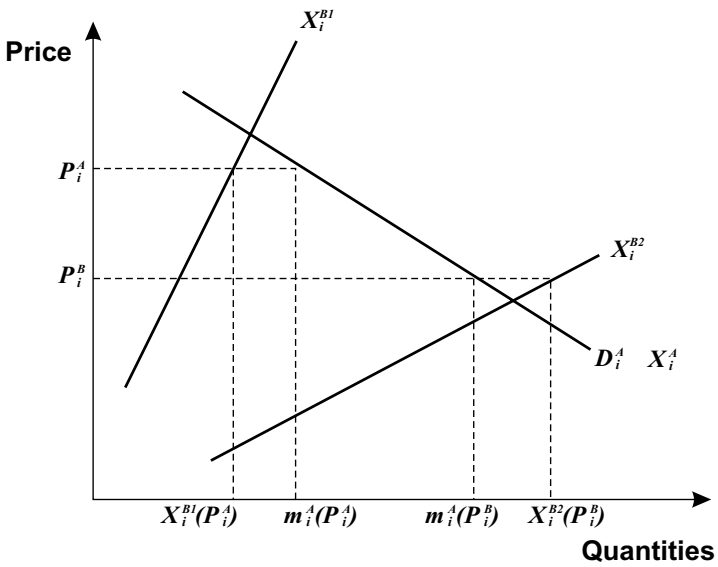
4.2 Conceptual framework

We adopt Grossman and Helpman's (1995) framework and in particular the adaptation of their framework by Vaillant and Ons (2003). We present this framework for two small economies (A and B), which could represent respectively regional import and export markets. We assume that all goods are produced with constant returns to scale, using labor and a sector specific factor; consumers within each economy have identical preferences which are represented by a quasi-linear utility function. The economy is small and therefore world prices are given exogenously. Without loss of generality, all international prices (P_i) are normalised to one, while domestic prices in country Z, with Z={A,B} are equal to $P_i^z = P_i\,(1+t_i^z)$, the international price increased by an ad valorem tariff. Initially, the most favoured nation (MNF) principle holds.

To analyse the impact of opening trade of commodity ***i*** as part of an FTA between importing country A and exporting country B, the key variables are: the value of imports to A; supply and exports from B; and the import tariffs applied to trade of ***i*** in both countries. We assume that country B is an efficient producer of commodity ***i*** or at least is a more efficient producer than A, which means that domestic prices of good ***i*** in A and B are $P_i^A > P_i^B \geq 1$, with $P_i^B = 1$ if B is an efficient exporter of good ***i***.

Figure 4.1 shows the demand for imports by country A and two different total supply curves for country B.[10] The location of B's supply depends on the endowment of the specific factor used by B to produce ***i***. If the production capacity of B is small, then total supply of ***i*** from country B is represented by $X_i^{B_1}$. In this case, total supply from B at price $P_i^A(X_i^B(P_i^A))$ is not enough to satisfy A's import demand at that price ($m_i^A(P_i^A)$). The opposite extreme case is that the specific endowment in B is so large that country B's supply of ***i*** ($X_i^B(P_i^B)$)can satisfy A's import demand at the lower price P_i^B and still export to the rest of the world. In this case B's supply response is represented by the curve $X_i^{B_2}$; the price in importer A's market is know reduced to the price in B (P_i^B), total imports in A are ($m_i^A(P_i^B)$), and total exports in B are ($X_i^{B_2}(P_i^B)$).

Figure 4.1 Effects of a regional trade agreement



[11]Notice that this is not export supply but total supply of industry ***i*** of country B.

It is worth noticing that if both countries export good ***i*** in the initial equilibrium, or if country A imposes no tariff on imports of good ***i*** while B is an efficient exporter, then domestic prices are similar to the international price in both countries and the trade agreement would have no effect on production, consumption or bilateral trade. The relevant cases are then given by those products which are initially imported by at least one of the countries, subject to a most favoured nation (MFN) tariff rate different from zero (sensitive commodities). If this is the case, and as stressed by Grossman and Helpman (1995), depending on the size of B's potential output, the marginal product produced in B might be sold in A's protected market, in B's less protected market or on the world market, with prices for producers and consumers in A and B varying accordingly.

Three different outcomes from integration could result in this market depending on the relative size of aggregate supply of ***i*** in country B and of import demand of ***i*** in country A. Grossman and Helpman (1995) refer to these results as:

- enhanced protection;
- reduced protection; and
- the intermediate case.

We briefly discuss the first two cases and its implications for each country/region (Figure 4.1). The intermediate case results are a combination of the effects of the two extreme cases and will not be discussed here (see Vaillant and Ons, 2003).

Reduced protection

Supply in country B ($X_i^{B_2}$ in figure 4.1) at the lowest initial price $P_i^{B_2}$ can satisfy all of country A's import demand, $X_i^B(P_i^B) > m_i^A(P_i^B)$. Under a trade agreement A stops importing from the rest of the world (ROW) and its domestic price falls to P_i^B. The producers in A enjoy less protection under the trade agreement than in the initial equilibrium. Producers in B are the only foreign suppliers in A's market, and they also satisfy at least a part of their domestic market. The price paid by consumers in B for good i and the price obtained by producers in B remains unchanged at the level P_i^B.

Enhanced protection

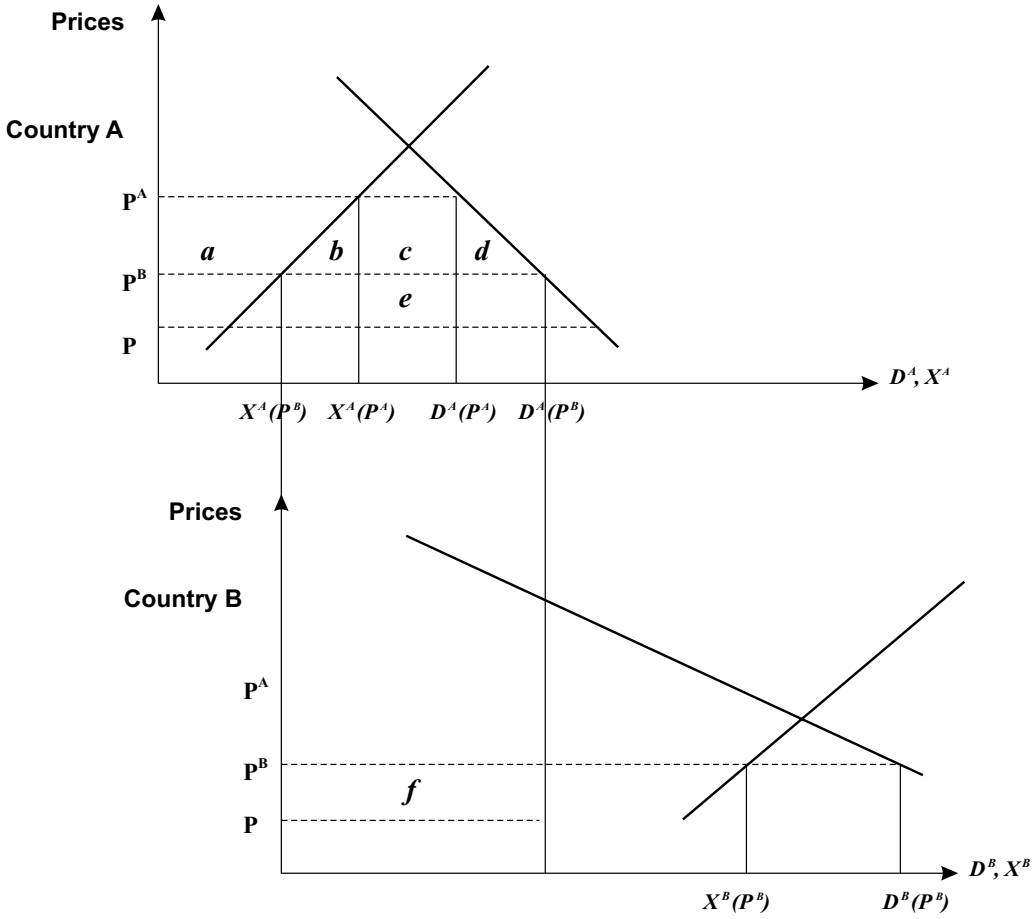
A FTA results in enhanced protection for the exporter when supply of country B is small with respect to demand in country A as a result of a relatively small endowment of the specific factor in B (supply $X_i^{B_1}$ in figure 4.1). At the initial price in A (P_i^A), the aggregate supply from country B is not enough to satisfy all the import demand of country A; $X_i^B(P_i^A)$-<$m_i^A(P_i^A)$. Therefore, under an eventual FTA, A has to continue importing from the ROW and its domestic price remains unchanged. Given that $P_i^A > P_i^B$ producers in B divert all their production to A's market, while consumers in B have to satisfy all their demand by purchasing from the ROW at the initial price. The only effect of the FTA in this case is an increase in those prices paid to producers in the more efficient country. This is what Grossman and Helpman call "enhanced protection" for producers in country B.

Trade diversion and trade creation

The classification of those industries that show reduced or enhanced protection is directly related to the welfare results of the FTA according to the definitions of trade creation and trade diversion discussed above. These effects are graphically presented in Figures 4.2 and 4.3.

Figure 4.2 shows the welfare changes in an importing country (A) and an exporting country (B) in the case of reduced protection and an inefficient exporter. When A eliminates tariffs imposed on regional exporter B, consumers in A import from B instead of from the ROW because now they pay P_i^B for product ***i*** instead of P_i^A (with $P_i^A > P_i^B$). With lower domestic prices, producers in A lose area ***a***; consumers' surplus increases by area ***a+b+c+d*** but area ***e*** corresponds to a loss for consumers in tariff revenue given that all imports come from B. As production from B is now being exported to A, country B imports from the rest of the world at price P^B to meet its domestic demand.

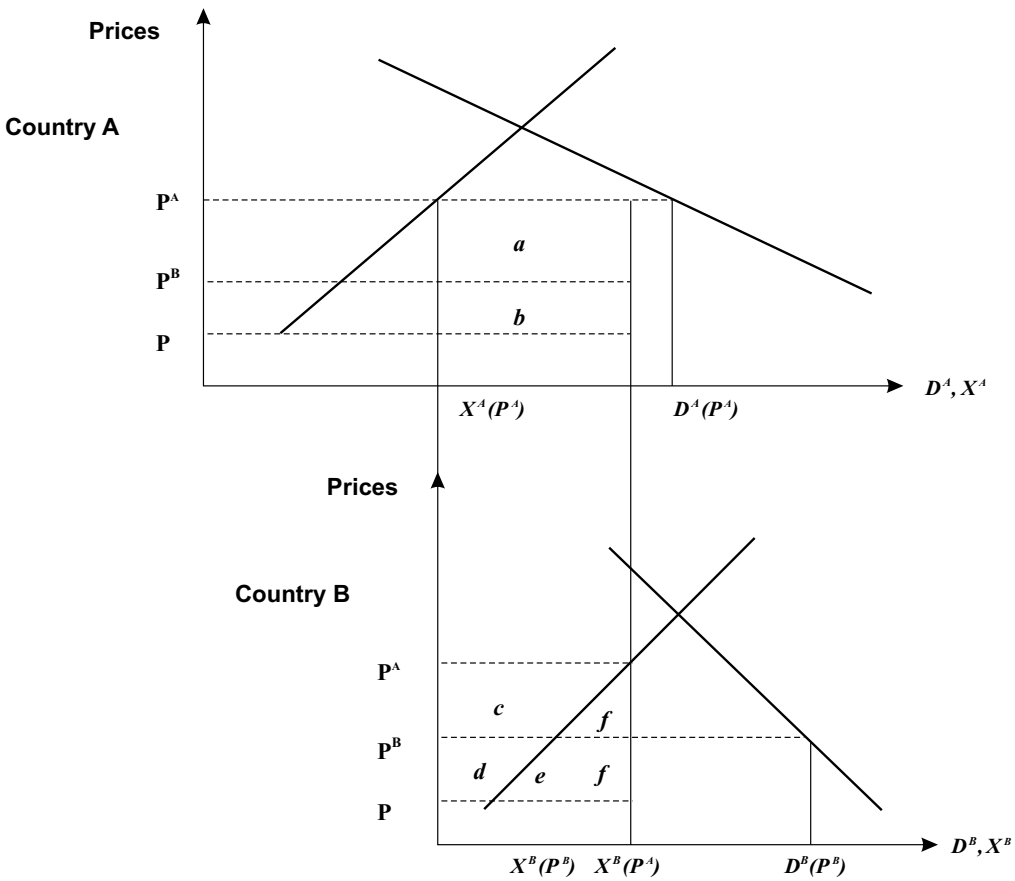
Figure 4.2 Supply and demand curves in importing and exporting countries in the case of an FTA resulting in reduced protection



Source: Adapted from Vaillant and Ons (2003).

Consumers in country B gain tariff revenue ***f*** as a result of these imports. Given that ***f*>*e*** (***e*** is only a fraction of ***f***), the region as a whole gains unambiguously. Exporters in B also gain, while results in the importing country depend on the relative size of areas ***e*** (trade diversion) and **b+d** (trade creation), which means that if regional exporters in industry ***i*** are inefficient the results for the importing country are ambiguous. If trade creation is bigger than trade diversion (***e*<*b*+*d***), then consumers in A benefit from the FTA. Figure 4.2 can be used also to show the case of an efficient regional exporter. In this case, $P_i^B = P_i$ resulting in ***f = e = 0*** and areas ***b, c*** and ***d*** being bigger than in the previous case. Now, consumers in importing country A unambiguously gain, while exporting country B is not affected by the FTA.

Figure 4.3 Supply and demand curves in importing and exporting countries in the case of an FTA resulting in enhanced protection



Source: Adapted from Vaillant and Ons (2003).

If the FTA results in enhanced protection for industry ***i***, then the region as a whole and consumers in the importing country unambiguously lose, while producers in exporting countries unambiguously benefit. Producers in the importing country are not affected while consumers in exporting countries could gain. Figure 4.3 presents the case of enhanced protection with an inefficient regional producer. This is the case where import demand is larger than total supply in the exporting region. Elimination of tariffs imposed by A result in increased imports from B, although, in this case production in B cannot supply total import demand in A. As a consequence A still imports from the ROW imposing a tariff and because of this, domestic price in A after trade liberalisation is still P_i^A. Consumers in country A lose tariff revenue ***a+b*** as no tariff is collected from the FTA partner. Exporters in B increase surplus by area c, while consumers gain from tariff revenue ***d*** from increased imports from the ROW, as domestic production goes now to country A. Total gains in country B result from adding gains in consumer and producer surplus ***c+d+e***. As ***a+b = c+d+e+f***, net loss for the region is equal to area ***f***. In the case of an efficient producer ($P^B = P$), the loss in country A is the same as before, not depending on the level of protection in B but only on the level of its own tariff. All gains in country B go now to producers (***c+d***) given that there is no tariff revenue for consumers. The loss for the region as a whole is bigger than in the case of the inefficient exporter, corresponding to area ***e+f***.

In sum, depending on the relative size of import demand in the importing country and total supply in the exporting country, and assuming that the exporter is an efficient producer and that the importer is inefficient and imposes a tariff on imports of product ***i*** before the agreement, we can have the three situations that are summarised in Table 4.1. The total effect on the region of the different cases shows that enhanced protection results in unambiguously negative impacts for the region as a whole. On the other hand, reduced protection unambiguously results in trade creation with positive effects on the region as a whole.[11]

As results in the next section show, most import markets in the region appear to be small compared to supply from the region. This means that sensitive industries are a peril for most countries and with reduced protection under regional trade liberalisation, importing countries would reduce domestic production of these industries.

This framework allows us to determine the welfare effects of the trade agreement on consumers and producers in different countries, on importing and exporting countries, and on the region as a whole.

Table 4.1 Summary of regional welfare effects of a trade agreement

Country	Consumers	Producers	Total country	Region
Enhanced protection				Negative
A (importer)	Negative	Nil	Negative	
B (exporter)	Positive	Positive	Positive	
Reduced protection				Positive
A (importer)	Positive	Negative	Positive	
B (exporter)	Nil	Nil	Nil	
Intermediate				Ambiguous
A (importer)	Ambiguous	Negative	Ambiguous	
B (exporter)	Nil	Positive	Positive	

Source: Adapted from Vaillant and Ons (2003).

[12]As discussed in Vaillant and Ons (2003) in each of the three cases presented above we can have two different situations depending on exporter B being an efficient exporter or a less inefficient producer than importer A. In both situations, the general conclusions for the three cases are almost the same. Some differences result from the application of a tariff by the relatively more efficient country B.

4.3. Methodology

The methodology mainly follows Vaillant and Ons (2003) and it is used in this study to define a list of sensitive agricultural industries for SADC countries. These are industries that could be affected by regional trade liberalisation. We also present elements to identify within this list, two different groups of industries, one defensive and one expansive, and the measure of welfare effects of an FTA in SADC.

The methodology involves three steps: the first step is to identify the industries where the greatest contractive or expansive adjustments are expected due to the FTA. This means identifying two groups of industries: industries with high trade complementarity using measures of revealed comparative advantage (RCA) and revealed comparative disadvantage (RCD), and within this latter group the sensitive industries, using information on tariffs for industries in the different countries. The final step classifies industries according to the impact resulting from the elimination of tariffs on domestic prices in importing countries and on export prices in exporting countries (reduced protection, enhanced protection and intermediate), based on the protection regimes discussed in the conceptual framework.

In the first step, we estimate indices of RCA and RCD for each industry in each country and determine the set of industries showing high complementarity. The RCA measure proposed by Balassa (1965) implies that a country's pattern of comparative advantage could be observed from post-trade data, assuming that actual trade 'reflects relative costs as well as differences in non-price factors', and is grounded in conventional trade theory. As the focus is on trade between SADC countries, the reference (R) used to determine comparative advantage and disadvantage is the group of SADC countries, so our measure refers to advantages and disadvantages relative to the region (see the appendix for more details on the estimation of the RCA and RCD indexes).

Trade complementarity between agricultural industries in SADC is defined as the set including those industries for which one or more countries in SADC show a comparative advantage (RCA>1) and at the same time, at least one country shows a comparative disadvantage (RCD>1) for those industries. As discussed in Vaillant and Ons (2003), industries with high complementarity have a better chance of exploiting the eventual improvement in access to the new partner's market, and we expect that industries within this group will experience the greatest adjustments.

In the second step we identify the group of sensitive industries. We consider sensitive industries to be those industries showing trade complementarity for which the exporting country faces an ad valorem tariff different from zero in regional markets. Thus, sensitive products are those that show trade complementarity between SADC countries and that would gain improved conditions of access to the new partner market as a result of setting up a free trade area. On the other hand, complementary industries are not sensitive if suppliers currently face a zero tariff.

In the last step we determine which of the sensitive products constitute trade opportunities and perils for the different SADC countries. We focus in particular on the opportunities and threats that low-income countries face in contrast with those faced by middle-income countries. To do this we refer to our conceptual framework where industries with reduced or enhanced protection and intermediate industries are defined based on the relative size of import demand ($m_i^A(P_i)$) and supply of exporting

countries $(P_i X_i^B(P_i))$. We also use the information on initial value of imports and estimated value of imports at exporter's price together with information on tariffs and import elasticities to estimate the welfare results of the FTA. We assume that P, the world price for imports of products from industry ***i*** is $P_i = 1$, and that prices in exporting region A and importing region B are respectively $P_i^A = 1 + t_i^A$ and $P_i^B = 1 + t_i^B$, where t_i is an ad valorem tariff. Value of imports after FTA is then calculated using these prices and import elasticities. With prices, trade data to represent current trade value, and information on current supply, the areas under the demand and supply curves in figure 4.2 for all reduced protection industries in all countries can be quantitatively measured. The appendix includes a detailed explanation of how the different groups of industries are defined.

The same UN Comtrade dataset used in the previous two sections is used here, while data on tariffs is from Bouët et al. (2004). Broda and Weinstein (2006) describe the import demand elasticities (ϵ_i^A) used to calculate imports at exporter price in detail. They report three-digit elasticities for 73 countries in the world using six-digit harmonised system (HS) import data (1992 classification system) from the UN Comtrade database from 1994–2003 to estimate these elasticities. Information was available for three SADC countries: Madagascar, Malawi and Mauritius. The information from Madagascar and Malawi was used to define elasticity values for low-income countries and the information from Mauritius was used to define elasticities for middle income countries.

5. Intra-SADC Agricultural Trade Potential and Welfare Impact of a FTA

In sections 2 and 3 we analysed the structure of SADC agricultural exports and imports in terms of major commodities and markets. The analysis focuses on individual SADC countries and on the region as a whole. In this section we focus on the other important questions that this paper tries to address: what potential is there to expand intra-SADC agricultural trade and what welfare gains or losses will the RTA distribute among countries and industries? The assessment of these questions will be helpful to regional organisations and individual countries in gaining a better understanding of the potential gains of further regional integration through a customs union.

As explained in section 4, we first need to estimate the revealed comparative advantage (RCA) and disadvantage (RCD) for all countries and industries. We then match the lists of industries with RCA and RCD >1 and create a new list of industries that includes the intersection of these two sets, that is, commodities that simultaneously appear in the list of industries with RCA and industries with RCD. This is the set of industries with trade complementarity in SADC. From this group of industries we separate those with import tariffs greater than zero (($t_i^A > \mathbf{0}$)), which we call sensitive industries. Using import values, import elasticities and import prices (see section 4) we determine the group of sensitive industries facing reduced protection, the group of industries with enhanced protection and intermediate cases. We then use this classification of agricultural industries to analyse the potential of the region to expand agricultural trade and the opportunities and challenges faced by consumers and producers.

5.1. Regional and country level impacts of a FTA on agriculture

We summarise the general results of the analysis in Tables 5.1 (imports) and 5.2 (exports). For each group of industries in these tables, we present the share of that group in total agricultural imports or exports, the number of import or export industries in each country, and the average tariff imposed by countries on imports or average tariffs faced by exporters.

The first group includes total agricultural imports (Table 5.1) and total agricultural exports (Table 5.2) for each SADC country. Total imports account for $6.5 billion and exports for $10 billion. SADC countries trade products from a total of 193 SITC 4-digit industries. From the total set of importing and exporting industries we identify the number of industries showing strong trade complementarity in the region, those industries for which at least one SADC country has a RCA and at least one shows a RCD. We found trade complementarity in a total of 106 industries, representing 40 per cent of total imports and 29 per cent of exports. The average tariff on imports of complementary industries for the region is 10.7 per cent, while countries exporting these products face an average tariff in regional markets of 16.2 per cent.

The most important group for the analysis of the impact of a FTA among SADC countries is the group of sensitive industries. The share of imports and exports of these industries in total regional imports and exports is below 30 per cent, with imports showing an average tariff of 14.5 per cent. Most of the sensitive industries will see reduced protection while opportunities for enhanced protection for exporting countries are small and are related to 12 industries with total imports of $143 million and exports of only $43 million. Aggregated results for the region indicate that the welfare impact of a

FTA in the agricultural sector is positive (Figure 5.1). However, this benefit is small. We estimate the total value of trade creation to be $157 million or 0.92 per cent of total agricultural trade of SADC countries, and the net effect between trade creation and trade diversion to be $129 million or 0.75 per cent of total agricultural trade. These results say that a FTA would not have a significant welfare effect on SADC's agriculture. At country level Figure 5.1 shows that two-thirds of the gains from agricultural trade liberalisation would go to low-income countries, which is bigger than their contribution to regional agricultural GDP and their share in agricultural trade. Almost one-third of the gains from trade would go to SACU, slightly above its share in regional agricultural GDP and almost half of its share in total agricultural trade. The largest gains would go to Zimbabwe, SACU, Malawi, Mauritius and Tanzania, while the welfare of Angola and the DRC would be negatively affected by the agreement.

Table 5.1. Value of agricultural imports and classification of agricultural industries of SADC countries in industries with trade complementarity, sensitive industries and protection regimes resulting from an FTA

		Angola	DRC	Madagas.	Malawi	Mauritius	Mozambique	Tanzania	Zambia	Zimbabwe	SACU	Total
Total imports	Value (million $)	884	223	216	144	600	309	320	162	263	3,333	6,454
	Share Ag imports (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	N of industries	182	177	174	187	190	187	191	189	185	193	193
	Tariff (%)	10.1	7.0	1.8	3.7	6.5	6.5	8.8	5.5	5.5	9.2	8.5
Trade complement -arity	Value (million $)	511	88	142	52	276	149	79	60	122	1,087	2,567
	Share Ag imports (%)	57.9	39.8	66.8	36.5	45.9	48.2	24.8	37.3	46.8	33.9	40.6
	N of industries	30	28	33	28	26	36	19	27	27	99	106
	Tariff (%)	16.9	15.1	2.1	6.8	9.6	10.1	22.1	8.5	22.0	7.2	10.7
Sensitive industries	Value (million $)	511	88	50	32	84	149	79	58	121	543	1,713
	Share Ag imports (%)	57.9	39.5	23.3	22.6	14.0	48.2	24.5	35.8	46.2	16.9	27.1
	N of industries	30	27	12	24	18	36	13	25	26	55	85
	Tariff (%)	16.9	15.1	6.1	11.0	31.4	10.1	22.3	8.9	22.3	9.4	14.5
Reduced protection[1]	Value (million $)	462	78	48	28	82	142	119	67	52	491	1,570
	Share Ag imports (%)	52.3	35.3	22.6	19.7	13.6	46.2	37.2	41.8	19.7	15.3	24.8
	N of industries	25	23	11	21	17	31	11	23	25	49	73
	Tariff (%)	17.7	15.1	6.2	11.0	31.8	10.3	24.3	9.4	22.4	9.6	12.0
Enhanced & intermediate protection[1]	Value (million $)	49	9	1	4	2	6	2	11	6	52	143
	Share Ag imports (%)	5.6	4.2	0.7	2.8	0.4	2.0	0.5	6.9	2.4	1.6	2.3
	N of industries	5	4	1	3	1	5	2	2	1	6	12
	Tariff (%)	8.8	15.3	4.7	11.2	15.5	5.0	10.0	5.6	13.6	11.8	10.5

Note: 1. Industries with reduced protection are those threatened by the FTA, with domestic production in importing countries displaced by imports while not affecting production in exporting countries. Industries with enhanced protection are those industries in exporting countries that find opportunities to increase production as a result of an increase in prices paid for their exports to regional markets.

Source: Authors' calculation based on UN Comtrade data.

Table 5.2. Value of agricultural exports and classification of agricultural industries of SADC countries in industries with trade complementarity, sensitive industries and protection regimes resulting from an FTA

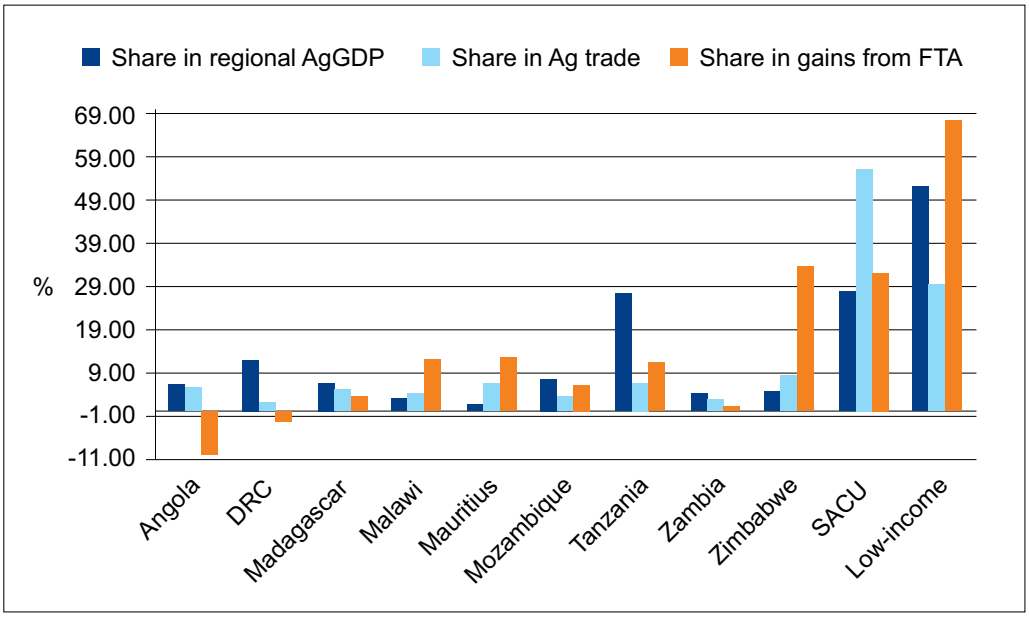
		Angola	DRC	Madagas.	Malawi	Mauritius	Mozambique	Tanzania	Zambia	Zimbabwe	SACU	Total
Total exports	Value (million $)	40	79	573	488	498	312	717	271	1,081	6,069	10,128
	Share Ag exports (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	N of industries	100	118	155	144	166	155	187	161	182	193	193
	Tariff (%)(a)	1.1	2.1	4.4	4.7	13.1	3.0	4.3	9.5	6.1	8.0	7.2
Trade complement -arity	Value (million $)	1	20	280	130	349	48	314	170	453	1,440	3,205
	Share Ag exports (%)	2.3	27.1	49.1	26.8	70.3	15.7	43.8	63.8	42.1	21.1	31.3
	N of industries	3	5	27	28	22	15	57	20	48	78	106
	Tariff (%)(a)	5.1	1.6	16.5	16.7	13.5	9.5	8.6	8.3	11.9	21.1	16.2
Sensitive industries	Value (million $)	0	19	259	130	331	46	286	140	437	1,417	3,067
	Share Ag exports (%)	1.0	25.8	45.6	26.8	66.7	15.1	40.0	52.7	40.6	20.8	28.3
	N of industries	2	4	20	27	19	12	44	17	42	67	85
	Tariff (%)(a)	11.9	2.5	17.9	17.1	14.3	12.2	10.5	12.0	13.6	22.1	17.7
Reduced protection[1]	Value (million $)	0	14	251	130	330	46	281	140	424	1,407	3,024
	Share Ag exports (%)	0.9	19.2	44.1	26.8	66.5	15.1	39.2	52.7	39.3	20.6	27.9
	N of industries	1	3	15	24	15	11	39	17	38	58	73
	Tariff (%)(a)	12.0	2.5	18.0	16.9	13.3	12.8	10.5	11.8	13.6	22.1	17.6
Enhanced & intermediate protection[1]	Value (million $)	0	5	9	0	1	0	5	-	13	9	43
	Share Ag exports (%)	0.1	6.5	1.5	0.0	0.2	0.0	0.7	0.0	1.2	0.1	0.4
	N of industries	1	1	5	3	4	1	5	0	4	9	12
	Tariff (%)2	1.2	4.4	4.4	3.9	9.7	1.2	4.2	0.0	12.0	13.7	8.9

Notes: 1. Industries with reduced protection are those threatened by the FTA, with domestic production in importing countries displaced by imports while not affecting production in exporting countries. Industries with enhanced protection are those industries in exporting countries that find opportunities to increase production as a result of an increase in prices paid for their exports to regional markets.

2. Average tariffs faced by exporters.

Source: Authors' calculation based on UN Comtrade data.

Figure 5.1. Distribution of welfare gains in agriculture between groups of countries[1] resulting from an FTA in SADC compared to countries' share in regional agricultural GDP (2005) and agricultural trade (2000-2005)



Note: 1. Low-income countries include Madagascar, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe; SACU includes Botswana, Lesotho, Namibia, South Africa and Swaziland; trade is the sum of imports and exports.

Source: Authors' calculation based on UN Comtrade data.

Country level results in Tables 5.1 and 5.2 show that Angola, the DRC and Mozambique appear at present to have comparative disadvantages for agricultural production in the region. Angola imports $511.00 million (58 per cent of total agricultural imports) of products from 30 industries with high trade complementarity, while only exporting $1.0 million (2.3 per cent of agricultural exports) from three industries. The DRC also imports more products from industries with trade complementarity than it exports: $88.0 million of imports from 20 industries compared to $20.0 million of exports from five industries. The value of Mozambique's exports from industries with trade complementarity is only one third of the value of imports in this group of industries. SACU is the major exporter and importer of products from industries with high complementarity in the region, with $1,087 million imports and $1,440 million exports. Other net exporters are Zimbabwe, Mauritius, Tanzania and Madagascar.

As shown in Table 5.1, producers facing the most significant challenges from SADC's trade agreement are those in the group of industries with reduced protection in countries showing high tariffs like Mauritius, Tanzania and Zimbabwe (average tariffs greater than 22 per cent), and to a lesser degree Angola and the DRC (average tariffs of 18 and 15 per cent respectively). The agreement will negatively affect producers in 17, 11 and 25 industries in Mauritius, Tanzania and Zimbabwe respectively. Angola and the DRC will see protection reduced in more than 20 industries representing 52 and 35 per cent of total agricultural imports in those countries. The effect of reduced protection on production will likely be smaller in countries like Madagascar, Malawi, Zambia and SACU where average import tariffs are low (below11 per cent).

The scope for producers to benefit from industries with enhanced protection as a result of the FTA appears to be very limited according to our results, as would also be the negative effect of trade diversion from these industries. Producers who could benefit from enhanced protection are those in exporting industries in Zimbabwe, SACU, Madagascar, Tanzania and the DRC. These benefits could be significant for producers in four industries in Zimbabwe, nine in SACU, and five in Madagascar and Tanzania (Table 5.2), but the overall effect on agriculture would be small given that these industries represent 1.2 per cent or less of total exports of these countries.

5.2. Trade complementarity

We now focus on the group of industries with high trade complementarity. As seen in Tables 5.1 and 5.2, the number of these industries and their trade specialisation varies significantly between countries. The interior cells in Table 5.3 show the number of matches of importing and exporting industries between countries. Row totals represent the total number of matches that exports from countries in the first column find among industries imported by countries in the first row of the table. Column totals show the number of matches that imports to countries in the first row find among industries exported by countries in the first column of the table. SACU, Zimbabwe and Tanzania appear as the exporters with the highest potential in the region. SACU's exports find complementary industries in all countries, with more than 40 matches in Angola, the DRC, Mauritius and Mozambique and close to 30 in other countries (a total of 350 matches). Zimbabwe and Tanzania also have export opportunities in several countries, but most exporting industries in these countries have trade complementarity with SACU's import industries. The same is true for other countries exporting in the region. SACU is also the major importer, actually showing more matches for industries specialised in imports than in exports (524 matches compared to 349 respectively). Other importers with high comparative disadvantages and high number of matches for importing industries are Angola and the DRC.

Table 5.3 Number of matches between importing and exporting industries with high complementarity in SADC

	Importers										Total matches exporting industries
Exporters	Ang.	DRC	Mad.	Mwi	Mau	Moz	Zim	Tnz	Zmb	SACU	
Angola		1	1	1	2	2	1	1	1	9	19
DRC	0		1	0	1	0	1	0	1	11	15
Madagascar	4	5		3	11	9	5	5	7	53	102
Malawi	5	8	10		7	11	8	8	9	71	137
Mauritius	6	6	13	7		7	6	5	7	45	102
Mozambique	3	5	4	7	3		6	2	8	29	67
Zimbabwe	20	17	12	14	17	16		9	15	118	238
Tanzania	10	13	16	16	18	20	20		17	137	267
Zambia	5	3	5	3	8	3	8	1		51	87
SACU	54	46	33	35	43	47	31	29	31		349
Total matches importing industries	107	104	95	86	110	115	86	60	96	524	

Source: Authors' calculation based on UN Comtrade data

Table 5.4. presents industries with regional trade complementarity . The table shows the total value of imports and exports of main industries adding up to the totals presented in Tables 5.1 and 5.2 ($2,567 million in imports and $3,205 million in exports). The most important complementary industries are sugar, beverages (wine, distilled alcoholic beverages), cotton (raw, yarn), cereals (maize, rice), meat of bovine cattle, tea, coffee, cereal and milling products (meal and flour of cereals), and feed (oilseed cakes and food waste). The table also shows the share of imports and exports of each industry respectively coming from and going to the region. The share of imports coming from the region is twice as large as the share of exports going to the region (41 compared to 19 per cent), which in part is related to the relatively small size of the regional market for agricultural products, although this varies by industry. Exports of maize, non-alcoholic beverages, rice, meal and flour of cereals, oil seed cakes, beer, milk, yarn of wool and sugar confectionary have the region as their major destination, with more than 60 per cent of total exports of those industries going to SADC countries. On the other hand, raw sugar, raw cotton, tea and flowers are exported mainly to international markets and at the same time, they supply most of the regional import market of products from these industries. Products from industries like maize, non-alcoholic beverages, cigarettes and milk are mainly traded in the regional market, as both regional imports and exports have high shares in total trade.

Trade specialisation and the importance of different industries vary by group of countries. Figure 5.2 presents the value of imports and exports and the cumulative distribution of industries with regional trade complementarity across chapters of the SITC classification for low-income countries and SACU. Figure 5.2a shows that imports of low-income countries are concentrated in cereals, milling, and bakery products (chapter 04) and sugar (chapter 06 of the SITC classification). These products account for almost 80 per cent of total imports of these countries. In contrast with low-income countries, SACU's imports are more diversified and distributed across the whole range of agricultural products from animal products to textile fibres and yarn. Distribution of exports across products also varies by group of countries (Figure 5.2b). Low-income countries show high concentration of exports in chapter 07 of SITC: coffee, tea, cocoa, and spices, but also beans, flowers, vegetables, maize and tobacco. SACU countries export meat, cereals, sugar, cotton, tea, and wine.

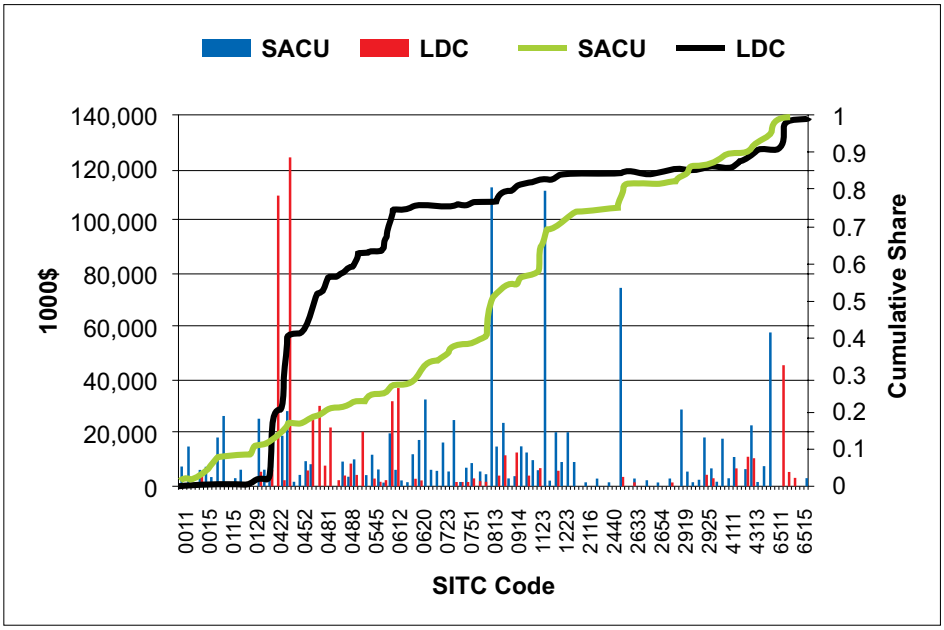
Table 5.4 Set of industries showing trade complementarity between SADC countries

		Exports			Imports		
SITC code	Industry	Value (1000 $)	Share in Ag exports (%)	To SADC importers (%)	Value (1000 $) (%)	Share in Ag imports (%)	From SADC exporters
0611	Raw sugar, beet & cane	511,305	5.0	3.0	67,842	1.1	83.1
1121	Wine of fresh grapes including grape must	470,765	4.6	1.9	58,180	0.9	13.2
2631	Raw cotton, other than linters	304,359	3.0	24.0	99,275	1.6	73.4
0440	Maize (corn),unmilled	168,453	1.6	62.4	152,705	2.4	76.4
0752	Spices, exc. pepper & pimento ground or not	231,638	2.3	0.3	13,075	0.2	39.4
0612	Refined sugar & other products of refining, no syrup	122,078	1.2	33.8	95,919	1.5	40.3
1124	Distilled alcoholic beverages	36,735	0.4	40.7	129,463	2.0	7.4
0111	Meat of bovine animals, fresh, chilled or frozen	114,139	1.1	2.1	50,757	0.8	4.6
1110	Non alcoholic beverages, nes	72,448	0.7	70.4	73,426	1.2	72.8
6513	Cotton yarn & thread, grey, not mercerized	50,594	0.5	40.8	114,295	1.8	9.5
0422	Rice, glazed or polished, not further prepared	10,448	0.1	65.8	135,204	2.1	0.5
0711	Coffee, green or roasted	114,439	1.1	2.3	32,573	0.5	8.8
0460	Meal and flour of wheat or of meslin	20,507	0.2	69.9	113,869	1.8	20.8
0741	Tea	100,445	1.0	16.4	26,786	0.4	79.4
0470	Meal & flour of cereals exc.wheat or meslin	35,385	0.3	84.6	75,022	1.2	47.4
1222	Cigarettes	57,485	0.6	45.3	48,739	0.8	74.6
0813	Oil seed cake & meal & other veg. Oil residues	7,779	0.1	69.8	112,801	1.8	3.7
1123	Beer including ale, stout, porter	21,368	0.2	90.0	84,996	1.3	50.5
2927	Cut flowers & foliage	98,369	1.0	0.7	1,515	0.0	78.6
0819	Food wastes & prepared animal feed, nes	20,745	0.2	31.7	35,346	0.6	25.4
0542	Beans, peas, lentils & leguminous veg., dried	35,013	0.3	9.9	41,448	0.7	27.0
6114	Leather of other bovine cattle & equine leather	15,913	0.2	6.5	58,313	0.9	2.2
0484	Bakery products	23,387	0.2	44.1	40,269	0.6	25.0
0223	Milk & cream fresh	8,855	0.1	91.1	41,209	0.7	45.2
6512	Yarn of wool and animal hair	8,448	0.1	65.5	57,431	0.9	9.1
0545	Other fresh vegetables	39,076	0.4	2.5	23,713	0.4	48.4
0482	Malt including malt flour	9,725	0.1	95.4	44,059	0.7	32.1
0620	Sugar confectionery & other sugar preparations	6,788	0.1	87.5	34,349	0.5	37.5
0488	Preparations of cereals, flour & starch for food	11,713	0.1	42.5	34,748	0.5	12.0
0118	Other fresh, chilled, frozen meat & edible offals	37,522	0.4	0.8	5,939	0.1	5.8
	Other	438,846	4.3	20.0	664,355	10.5	23.4
	Total	3,204,768	31.3	18.7	2,567,622	40.6	31.0

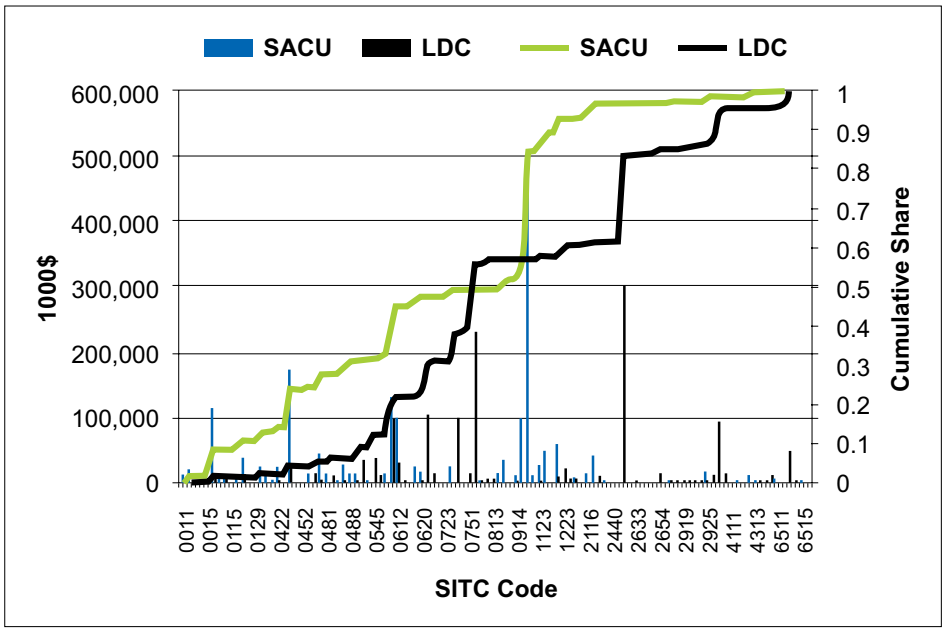
Source: Authors' calculation based on UN Comtrade data.

Figure 5.2. Value of imports and exports at the SITC four-digit level[1] and cumulative distribution across chapters of the SITC classification

a) Imports



b) Exports



Note: 1. Chapters of SITC with agricultural industries are: (00) live animals; (01) meat; (02) dairy; (03) fish; (04) cereals, milling and cereal preparations; (05) vegetables; (06) sugar; (07) coffee, tea, cocoa & spices; (08) feed; (11) beverages; (12) tobacco; (21) hides & skins; (26) veg. fibers; (29) veg. materials; (43) fats, oils & waxes; and some industries in (61) leather and (65) yarns.

Source: Authors' calculation based on UN Comtrade data.

5.3. Sensitive industries

We found a total of 85 industries in SADC that are part of the group of industries with trade complementarity and, at the same time, have tariffs greater than zero. These sensitive industries represent 27 and 28 per cent of total agricultural imports and exports of SADC countries respectively.

Table 5.5 presents sensitive four-digit SITC industries for the SADC region sorted by tariff. The most sensitive industries are mostly food processing, or industries with relatively high value added like: cereal grains, flaked, pearled; bakery products; tomatoes, fresh; wine; beer; tobacco, manufactured; pig meat, bacon, ham; meal and flour of cereals; cigarettes; vegetables, frozen or in temporary preservative; other fresh vegetables; cigars and cheroots; refined sugar; and spices. Average tariffs for these industries are all above 20 per cent.

A step below in the scale of protection (average tariffs between 15 and 20 per cent) we find dairy and oil industries like milk and cream fresh; margarine; animal and vegetable oils; vegetable products for human food not elsewhere specified (nes); hydrogenated oils and fats. Also in this category we find beans, peas, lentils and leguminous dried; cotton yarn; and maize, unmilled.

Given that most of the sensitive industries face reduced protection, as shown in Tables 5.1 and 5.2, we have not presented sensitive industries for different SADC countries and regions here. Instead, we present the group of industries facing reduced protection by country in the next section. Because of the very small incidence of industries with enhanced protection in our results, these industries will not be discussed but information on them can be found in the appendix.

Table 5.5 Sensitive agricultural industries sorted by tariff

SITC	Industry	Tariff (%)	Import value (1000 $)	Import share (%)	Export value (1000 $)	Export share (%)
0112	Meat of sheep & goats, fresh, chilled or frozen	40.0	13,568	0.29	871	0.01
1121	Wine of fresh grapes including grape must	35.4	46,852	1.01	470,765	4.60
1222	Cigarettes	34.8	30,421	0.66	57,485	0.56
0730	Chocolate & other food prep. of cocoa	30.3	11,524	0.25	17,212	0.17
1110	Non alcoholic beverages, nes	30.2	58,665	1.27	72,448	0.71
1123	Beer including ale, stout, porter	29.4	79,880	1.73	21,368	0.21
1122	Cider & fermented beverages, nes	29.0	1,507	0.03	3,608	0.04
0616	Natural honey	28.8	1,069	0.02	1,524	0.01
1223	Tobacco, manufactured for smoking, chewing snuff	28.8	2,928	0.06	20,837	0.20
0481	Cereal grains, flaked, pearled	25.0	9,714	0.21	10,100	0.10
0544	Tomatoes, fresh	24.6	292	0.01	1,216	0.01
0742	Mate	24.0	799	0.02	894	0.01
0741	Tea	22.7	22,190	0.48	100,445	0.98
0546	Vegetables, frozen or in temporary preservative	21.4	4,615	0.10	11,873	0.12
0752	Spices, exc. Pepper & pimento ground or not	20.2	5,252	0.11	231,638	2.26
1221	Cigars & cheroots	20.2	514	0.01	594	0.01
0484	Bakery products	18.8	30,367	0.66	23,387	0.23
0612	Refined sugar & other prod. of refining, no syrup	18.2	95,814	2.08	122,078	1.19
4312	Hydrogenated oils and fats	17.1	13,350	0.29	6,039	0.06
0470	Meal & flour of cereals exc. wheat or meslin	16.2	65,945	1.43	35,385	0.35
0440	Maize (corn),unmilled	15.6	105,756	2.29	168,453	1.65
0611	Raw sugar, beet & cane	14.6	56,112	1.22	511,305	4.99
0223	Milk & cream fresh	13.8	16,237	0.35	8,855	0.09
0914	Margarine, imitn lard & preprd edible fats nes	13.2	28,543	0.62	9,936	0.10
0488	Preparations of cereals, flour & starch for food	12.9	31,477	0.68	11,713	0.11
2631	Raw cotton, other than linters	12.1	80,494	1.74	304,359	2.97
0620	Sugar confectionery & other sugar preparations	11.9	19,987	0.43	6,788	0.07
0422	Rice, glazed or polished, not further prepared	11.1	104,327	2.26	10,448	0.10
0542	Beans, peas, lentils & leguminous vegetab., dried	10.9	41,448	0.90	35,013	0.34
0113	Meat of swine, fresh, chilled or frozen	10.7	31,523	0.68	2,561	0.03
0111	Meat of bovine animals, fresh, chilled or frozen	10.0	38,146	0.83	114,139	1.11
1124	Distilled alcoholic beverages	10.0	122,749	2.66	36,735	0.36
4313	Acid oils, fatty acids and solid residues	9.9	29,742	0.64	3,050	0.03
0483	Macaroni, spaghetti, noodles, vermicelli etc.	9.6	20,364	0.44	2,175	0.02
0460	Meal and flour of wheat or of meslin	9.3	106,013	2.30	20,507	0.20
	Sub-total	16.7	1,328,185	29	2,455,802	24
	Other	6.6	385,198	8	610,825	6
	Total	14.5	1,713,384	37	3,066,628	30

Source: Authors' calculation based on UN Comtrade data.

5.4 Challenges and opportunities of a FTA in agriculture

We now look in detail at the sensitive industries to determine which ones might contract their production levels and which industries will find expansion opportunities as a result of eliminating trade barriers between SADC countries. As discussed in section 4, if supply from the region can satisfy all import demand of regional import markets, and regional exporters are more efficient producers than regional importers, importers would stop importing from the rest of the world under a trade agreement and import from the region. Under these circumstances, producers in importing countries would enjoy less protection under the trade agreement than in the initial equilibrium, and their domestic price would fall to the level of prices in regional exporters' markets. Producers in exporting countries would be the only suppliers of regional markets, and they would also satisfy at least a part of their domestic market. The price paid by consumers and the price obtained by producers in exporting countries would remain unchanged at the initial level. This is the case of reduced protection. On the other hand, when regional import demand is large compared to regional supply, more efficient producers from the region would export to regional import markets, but importers would still need to rely on imports from the rest of the world. Because of this, the price at the importing country would not change with the trade agreement and would be equal to the international price, plus the tariff the importing region imposes on the rest of the world. In this case, the FTA would enhance protection for regional exporters who would benefit from the higher price they obtain in the protected regional market.

As Table 5.1 shows, the elimination of trade barriers between SADC countries results in reduced protection for a large majority of sensitive industries. Here we are interested in looking in detail at the industries in different countries that would be affected by the trade agreement. Table 5.6 shows industries facing reduced protection in low-income countries if tariffs between SADC countries are eliminated. The table shows the tariff each country imposes on imports of products of those industries to give a sense of the potential impact that the elimination of those tariffs could have in each industry and country. The higher the tariff, the higher is the expected negative impact on domestic production of that industry. The table also shows total imports of the countries facing reduced protection in each industry and the share of these imports in total agricultural imports of low-income countries. Tariffs shown for industries and countries are only those tariffs above 10 per cent. Industries affected represent 19 per cent of all agricultural imports of these countries. On average, high tariffs in low-income countries are imposed on meat (01), beverages and tobacco (11-12), cereal and cereal preparations (04), oils, fats and waxes (43), coffee, tea, cocoa and spices (07), and vegetables (05). For these groups of industries, average tariffs are above 20 per cent. Level of tariffs in other SITC chapters are between 18 (sugar, 06) and 14 per cent (textile fibres, 26).

Looking at individual low-income countries in Table 5.6, Mozambique and Zimbabwe are the countries with the highest number of industries with high tariffs facing reduced protection (15 and 14 respectively); Malawi, Tanzania and Zambia have ten industries and Madagascar only three. The structure of protection across sectors, and thus the industries facing output contraction and increased regional imports, varies by country. In the case of Mozambique, Tanzania and Zimbabwe, industries facing reduced protection in an FTA are spread across most of the SITC chapters, but are specially concentrated in cereals, cereal preparations, live animals and meat, and vegetables. Other industries at risk in these countries are mostly those industries that incorporate higher value added. Mozambique shows relatively high protection on beverage and tobacco (wine, beer, cigarettes and manufactured tobacco) and in spices. In Tanzania, domestic production of raw and refined sugar is expected to shrink as a consequence of the FTA, while in Zimbabwe, industries in the group facing reduced protection are animal and vegetable oils, hydrogenated oils and fats and cotton yarn and thread.

Table 5.6. Low-income countries: industries facing reduced protection as a result of eliminating tariffs between SADC countries

STIC	Industries	MAD	MWI	MOZ	TZA	ZBA	ZBW	Share in Ag imports
0013	Swine			15.8	16.6		18.1	0.0
0014	Poultry, live				15.1			0.0
0121	Bacon, ham & other dried, salted, smoked pig meat				25.0			0.0
0223	Milk & cream fresh		10.2	22.8				0.4
0421	Rice in the husk or not, not further prepared				19.5			0.1
0422	Rice, glazed or polished, not further prepared				25.0			1.9
0440	Maize (corn),unmilled						23.2	4.6
0459	Cereals, unmilled, nes			16.1			14.8	0.2
0460	Meal and flour of wheat or of meslin			23.2				0.4
0470	Meal & flour of cereals exc. wheat or meslin		14.2				25.4	2.1
0481	Cereal grains, flaked, pearled		22.0	19.0		21.0	37.4	0.5
0484	Bakery products			25.0				0.2
0488	Preparations of cereals, flour & starch for food		21.9		23.3			0.3
0541	Potatoes, fresh, not including sweet potatoes						16.5	0.2
0542	Beans, peas, lentils & leguminous vegetab., dried		16.4	17.1		11.7	20.1	1.4
0544	Tomatoes, fresh			25.0				0.0
0545	Other fresh vegetables			22.9		23.7		0.2
0546	Vegetables, frozen or in temporary preservative					23.6		0.0
0548	Vegetable products, chiefly for human food nes				19.3	15.2	26.0	0.1
0611	Raw sugar, beet & cane	10.4			25.0			1.1
0612	Refined sugar & other prod. of refining, no syrup	12.1			25.0			2.3
0752	Spices, exc. Pepper & pimento ground or not	15.6		25.0		22.1		0.2
0812	Bran, pollard, sharps & other by products						15.0	0.0
0814	Meat & fish meal, unfit for human consumption						14.8	0.1
0914	Margarine, imitn lard & preprd edible fats nes		20.0	25.0	24.9	17.1		0.7
1121	Wine of fresh grapes including grape must			25.0				0.3
1123	Beer including ale, stout, porter			25.0				0.4
1221	Cigars & cheroots		21.2					0.0
1222	Cigarettes		21.0	25.0				0.4
1223	Tobacco, manufactured for smoking, chewing snuff			25.0				0.1
2119	Hides & skins, nes						13.0	0.0
2640	Jute & waste					14.3		0.0
4311	Anim./veg. oils, boiled, oxidized, dehydrated		23.6			23.1	12.4	0.0
4312	Hydrogenated oils and fats		23.6			23.5	27.2	0.5
6514	Cotton yarn & thread, bleached, dyed, mercerd.						16.0	0.0
	Sub-total							18.9
	Other							13.6
	Total							32.5

Source: Authors' calculation based on UN Comtrade data.

The protection structures, and thus the industries in the group of reduced protection, are quite different in Malawi and Zambia from those in the previous three countries. In Zambia, the highest tariffs are imposed in other fresh and frozen vegetables; animal or vegetable oils; hydrogenated oils and fats; and cereal grains, flaked, pearled. Similarly, Malawi imposes high tariffs in oils, fats and margarine; cigars and cigarettes; and preparation of cereals. Madagascar is the country with the lowest agricultural protection in the region. Only three industries could be affected by reduced protection: raw and refined sugar, and spices, all with tariffs below 15 per cent.

Table 5.7 shows industries facing reduced protection in SACU, Mauritius, Angola and the DRC. These regions show higher average tariffs on agriculture than low-income countries. SACU imposes tariffs on 25 industries while protected industries in the other three countries go from 16 to 18, higher than in all low-income countries. In general, protection covers most SITC chapters in these four countries. SACU, the most important market in the region, shows relatively high average tariffs and highly protected industries. The industries that would be the most affected by a regional trade agreement are: non-alcoholic beverages and cheese and curd with peak tariffs above 90 per cent; cigarettes, and meat of sheep and goats with tariffs above 40 per cent; milk and cream fresh, and tobacco manufactured (tariffs greater than 30 per cent); and bakery products; natural honey; coffee, tea, cocoa and spices; wine; and cider and fermented beverages all with tariffs above 20 per cent.

Mauritius imposes high tariffs on various industries: cigarettes (79.6 per cent), refined sugar (78 per cent), wine (69.8 per cent), honey (64.1 per cent), chocolate and other food preparations of cocoa (51.5 per cent), and bakery products (40.1 per cent). Protection in the DRC also extends across several industries but tariffs are all between 10 and 20 per cent. Angola protects beverages and tobacco with tariffs of 30 per cent in most industries, while tariffs applied to other industries like meat and cereal preparations are low (10 per cent).

Table 5.7. Other countries: industries facing reduced protection as a result of eliminating tariffs between SADC countries

SITC	Industries	Angola	DRC	Mauritius	SACU	Share in total Ag imports
0015	Horses, asses, mules and hinnies			12.6		0.0
0111	Meat of bovine animals, fresh, chilled or frozen	10.0			39.8	0.8
0112	Meat of sheep & goats, fresh, chilled or frozen				40.0	0.3
0113	Meat of swine, fresh, chilled or frozen	10.0	10.0		10.9	0.6
0121	Bacon, ham & other dried, salted, smoked pig meat	10.0			14.9	0.1
0223	Milk & cream fresh			25.0	34.1	0.1
0240	Cheese and curd		20.0		94.7	0.0
0460	Meal and flour of wheat or of meslin	10.0	10.0			1.6
0470	Meal & flour of cereals exc. wheat or meslin	10.0	10.0			0.7
0481	Cereal grains, flaked, pearled		14.5	20.0	15.6	0.1
0484	Bakery products	10.0	20.0	40.1	21.8	0.6
0488	Preparations of cereals, flour & starch for food	10.0	18.3	11.6	17.7	0.5
0544	Tomatoes, fresh				15.0	0.0
0545	Other fresh vegetables		10.0	14.4	18.2	0.1
0546	Vegetables, frozen or in temporary preservative		10.2	33.9	17.6	0.0
0611	Raw sugar, beet & cane		20.0		16.9	0.5
0612	Refined sugar & other prod. of refining, no syrup		20.0	78.0	16.4	0.3
0616	Natural honey			61.4	22.0	0.0
0730	Chocolate & other food prep. of cocoa	10.0	20.0	51.5	18.2	0.2
0741	Tea		20.0		23.5	0.4
0752	Spices, exc. pepper & pimento ground or not			20.7		0.0
0914	Margarine, imitn lard & preprd edible fats nes		20.0	15.0		0.1
1110	Non alcoholic beverages, nes	30.0			505.6	1.2
1121	Wine of fresh grapes including grape must	30.0		69.8	24.6	0.9
1122	Cider & fermented beverages, nes	30.0			21.6	0.0
1123	Beer including ale, stout, porter	30.0				1.5
1124	Distilled alcoholic beverages	35.0				0.3
1221	Cigars & cheroots		20.0			0.0
1222	Cigarettes	30.0	20.0	79.6	44.5	0.5
1223	Tobacco, manufactured for smoking, chewing snuff	30.0			31.3	0.0
2631	Raw cotton, other than linters				12.5	1.6
2927	Cut flowers & foliage	10.0			19.6	0.0
4311	Anim./veget. oils, boiled, oxidised, dehydrated			15.0		0.0
4312	Hydrogenated oils and fats		19.6			0.0
6514	Cotton yarn & thread, bleached, dyed, mercerd.				13.5	0.0
	Sub-total					13.2
	Other					9.4
	Total					22.6

Source: Authors' calculation based on UN Comtrade data.

5.5 Welfare impact of a FTA at the industry level

As discussed previously, the overall effect of a FTA on agriculture will result in positive welfare gains for the region as a whole and in particular for low-income countries. Here we focus on low-income countries and look at the impact of different industries on the total welfare effects at the country level dividing these effects on welfare gains into two main components:

- gains for importers as a result of reduced industry protection;
- gains for exporters to markets with reduced protection.

We look first at the gains for importers as the result of reduced protection in different markets (Table 5.8).

Results in Table 5.8 show that except for Zimbabwe, elimination of tariffs in a regional FTA results in negative welfare impacts for importers in all countries, although the absolute values of these losses are small. This means that in industries facing reduced protection, trade diversion dominates trade creation in agriculture when low-income countries open their agricultural markets to the region because the loss in tariff revenue that results from exports from the region is not compensated by the new trade created within the region. As discussed in section 4, trade diversion in the importing country is a result of the importer shifting from an efficient exporter to an inefficient one as a consequence of the FTA. Almost in all industries and countries, the welfare effect of a FTA is negative, which is evidence of the importance of inefficient regional exporters. The bottom line is that even though production in several agricultural industries in countries with relative high tariffs would reduce as a result of a FTA, the resulting producer's welfare losses would not be compensated by consumer's welfare gains. This means that there is no direct gain for low-income importing countries in SADC from opening their agricultural markets to regional imports.

Table 5.8 Low-income countries: welfare gains of countries importing products of industries facing reduced protection as a result of eliminating tariffs between SADC countries

SITC	Industry	Madagascar	Malawi	Mozambique	Tanzania	Zambia	Zimbabwe	Total	Share %
4312	Hydrogenated oils and fats	0	65	0	0	114	186	364	-3.9
0470	Meal & flour of cereals exc. wheat or meslin	0	-66	0	0	0	281	216	-2.3
0440	Maize (corn),unmilled	0	0	0	0	-394	531	137	-1.5
0814	Meat & fish meal, unfit for human consumption	0	0	8	0	11	93	112	-1.2
0482	Malt including malt flour	0	4	0	68	15	0	88	-0.9
1123	Beer including ale, stout, porter	0	0	-69	0	0	0	-69	0.7
0459	Cereals, unmilled, nes	0	-11	-3	0	-49	-14	-76	0.8
0541	Potatoes, fresh, not including sweet potatoes	0	0	0	0	-33	-58	-91	1.0
0545	Other fresh vegetables	0	0	-100	0	7	0	-94	1.0
0752	Spices, exc. pepper & pimento ground or not	85	0	-99	0	-93	0	-106	1.1
0460	Meal and flour of wheat or of meslin	-364	0	209	0	0	0	-155	1.7
0620	Sugar confectionery & other sugar preparations	0	-175	0	0	0	0	-175	1.9
0914	Margarine, imitn lard & preprd edible fats nes	-152	-22	47	46	-140	0	-222	2.4
0484	Bakery products	0	0	-452	0	0	0	-452	4.9
4313	Acid oils, fatty acids and solid residues	0	-59	0	-412	0	0	-471	5.1
0542	Beans, peas, lentils & leguminous veg., dried	0	-25	-73	0	-226	-239	-563	6.1
0488	Preparations of cereals, flour & starch for food	0	-238	0	-386	0	0	-623	6.7
0422	Rice, glazed or polished, not further prepared	0	0	-1,943	1,121	0	0	-822	8.8
0481	Cereal grains, flaked, pearled	0	-144	-250	0	-212	-321	-927	10.0
0611	Raw sugar, beet & cane	-327	0	-588	-107	0	0	-1,021	11.0
1121	Wine of fresh grapes including grape must	0	0	-1,093	0	0	0	-1,093	11.8
0612	Refined sugar & other prod. of refining, no syrup	0	0	0	-3,332	0	0	-3,332	35.8
	Other	2	2	-23	4	40	47	73	-0.8
	Total	-756	-668	-4,428	-2,995	-961	506	-9,302	100.0

Source: Authors' calculation based on UN Comtrade data.

A different picture arises when we look at welfare results for countries exporting to markets with reduced protection as a consequence of an FTA in SADC. As discussed in section 4, producers in these exporting countries don't benefit from trade given that the price they receive is the same as the one they received before the FTA. However, if the exporter is inefficient with respect to the rest of the world, consumers in exporting countries benefit from the fact that these countries need to import from the rest of the world to compensate for the supply that is now being directed to importing countries in the region. As the exporting country has a tariff on imports from the rest of the world, imports generate additional tariff revenue that benefits consumers. This means that the same inefficiency of exporters that results in negative welfare effects for regional importers is the factor explaining welfare gains in exporting countries, with these benefits going to consumers. If the exporter is efficient (no tariffs imposed) there is no welfare effect (positive or negative) for the exporting country as a result of the FTA. Table 5.9 summarises welfare results for countries exporting to markets with reduced protection in the region.

The positive welfare effects for low-income exporters in SADC shown in Table 5.9 are ten times bigger than the negative effects of opening their markets to agricultural trade as importers. Gains result from exports of cotton, beer, maize, rice, oilseed cakes and tea. Exports from industries like meat of swine; cigarettes; leather of other bovine; malt; meal and flour of wheat; refined sugar and other products; bakery products; tobacco, manufactured; and margarine, also contribute with significant welfare gains. Zimbabwe receives almost half of total welfare gains of low-income countries. The other half is shared by Tanzania, Malawi and Mozambique.

|Table 5.10 presents total net welfare gains for low-income countries. This table is obtained by adding welfare results for each industry and country in Tables 5.8 and 5.9. Zimbabwe, as a relatively inefficient exporter of agricultural products to the region, obtains the largest welfare gain among low-income countries through its exports of beer, cotton, oilseed cakes, leather, cigarettes, and malt, among others. Malawi and Tanzania follow Zimbabwe, with Malawi benefiting mainly from regional exports of rice and tea, and Tanzania from exports of tea, oilseed cake and meal and flour of wheat. Major benefits in other countries come from exports of maize and meat of swine in the case of Mozambique; refined sugar in Madagascar and meal and flour of wheat in Zambia.

Table 5.9 Low-income countries: welfare gains of countries exporting products of industries facing reduced protection in importing countries as a result of eliminating tariffs between SADC countries (1000 $)

SITC	Industry	Madagascar	Malawi	Mozambique	Tanzania	Zambia	Zimbabwe	Total	Share %
2631	Raw cotton, other than linters	0	61	409	7,380	223	5,206	13,280	13.7
1123	Beer including ale, stout, porter	0	0	0	0	0	12,462	12,462	12.9
0440	Maize (corn),unmilled	0	992	7,618	773	410	0	9,794	10.1
0422	Rice, glazed or polished, not further prepared	0	9,427	0	0	0	0	9,427	9.7
0813	Oil seed cake & meal & other veg. oil residues	1,953	382	354	1,697	0	4,680	9,066	9.4
0741	Tea	0	3,782	0	2,432	0	2,023	8,237	8.5
0113	Meat of swine, fresh, chilled or frozen	0	0	3,741	0	0	98	3,839	4.0
1222	Cigarettes	0	0	0	906	0	2,842	3,748	3.9
6114	Leather of other bovine cattle & equine leather	0	0	0	0	0	3,638	3,638	3.8
0482	Malt including malt flour	0	0	0	0	0	2,677	2,677	2.8
0460	Meal and flour of wheat or of meslin	0	0	0	1,340	740	142	2,221	2.3
0612	Refined sugar & other prod. of refining, no syrup	1,572	163	0	0	0	307	2,043	2.1
0484	Bakery products	0	0	0	0	0	1,866	1,866	1.9
1223	Tobacco, manufactured for smoking, chewing snuff	0	32	0	0	0	1,748	1,780	1.8
0914	Margarine, imitn lard & preprd edible fats nes	0	0	0	0	0	1,711	1,711	1.8
0611	Raw sugar, beet & cane	0	760	0	0	0	951	1,711	1.8
0542	Beans, peas, lentils & leguminous vegetab., dried	291	0	0	984	0	0	1,275	1.3
0488	Preparations of cereals, flour & starch for food	0	0	0	0	0	822	822	0.8
0545	Other fresh vegetables	0	0	0	153	0	523	676	0.7
0470	Meal & flour of cereals exc. wheat or meslin	0	0	0	674	0	0	674	0.7
2929	Materials of vegetable origin, nes	413	0	0	235	0	0	648	0.7
6113	Calf leather	0	0	0	0	523	32	555	0.6
0620	Sugar confectionery & other sugar preparations	0	0	0	0	0	507	507	0.5
	Other	963	582	13	1,463	182	928	4,129	4.3
	Total	5,191	16,182	12,135	18,036	2,078	43,162	96,784	100.0

Source: Authors' calculation based on UN Comtrade data.

Table 5.10 Low-income countries: net welfare gains[1] of a FTA in industries facing reduced protection as a result of eliminating tariffs between SADC countries

SITC	Industry	Madagascar	Malawi	Mozambique	Tanzania	Zambia	Zimbabwe	Total	Share
2631	Raw cotton, other than linters	0	61	409	7,380	246	5,206	13,303	15.2
1123	Beer including ale, stout, porter	0	0	-69	0	0	12,462	12,394	14.2
0440	Maize (corn),unmilled	0	992	7,618	773	16	531	9,931	11.4
0813	Oil seed cake & meal & other veg. Oil residues	1,953	382	354	1,697	0	4,680	9,066	10.4
0422	Rice, glazed or polished, not further prepared	0	9,427	-1,943	1,121	0	0	8,605	9.8
0741	Tea	0	3,782	0	2,432	46	2,023	8,283	9.5
0113	Meat of swine, fresh, chilled or frozen	0	0	3,741	0	0	98	3,839	4.4
1222	Cigarettes	0	0	0	906	0	2,842	3,748	4.3
6114	Leather of other bovine cattle & equine leather	0	0	0	0	0	3,638	3,638	4.2
0482	Malt including malt flour	0	4	0	68	15	2,677	2,765	3.2
0460	Meal and flour of wheat or of meslin	-364	0	209	1,340	740	142	2,066	2.4
1223	Tobacco, manufactured for smoking, chewing snuff	0	32	28	0	0	1,748	1,808	2.1
0914	Margarine, imitn lard & preprd edible fats nes	-152	-22	47	46	-140	1,711	1,489	1.7
0484	Bakery products	0	0	-452	0	0	1,866	1,414	1.6
0470	Meal & flour of cereals exc. wheat or meslin	0	-66	0	674	0	281	889	1.0
0481	Cereal grains, flaked, pearled	0	-144	-250	100	-212	-321	-827	-0.9
1121	Wine of fresh grapes including grape must	0	0	-1,093	0	0	0	-1,093	-1.2
0612	Refined sugar & other prod.of refining,no syrup	1,572	163	0	-3,332	0	307	-1,289	-1.5
0752	Spices, exc. pepper & pimento ground or not	412	0	-99	107	-93	0	327	0.4
4313	Acid oils, fatty acids and solid residues	188	-59	0	-412	0	0	-283	-0.3
2929	Materials of vegetable origin, nes	413	0	0	235	0	0	648	0.7
	Other	415	961	-795	1905	500	3777	6762	7.7
	Total	4,436	15,514	7,706	15,041	1,117	43,668	87,482	100.0

Note: 1. Calculated as the sum of welfare gains of each country as an importer and an exporter of each industry from the previous tables.

Source: Authors' calculation based on UN Comtrade data.

Finally, Table 5.11 shows net welfare gains for other countries (Angola, the DRC, Mauritius, SACU). Similarly to Zimbabwe, SACU benefits from protection from the rest of the world and its comparative advantage as an agricultural producer in the region. Meal and flour of cereals; wine; beer; and maize are the industries explaining most of the welfare gains of SACU countries. Mauritius, a country with comparative disadvantage in agriculture with respect to global markets, is able to benefit from a regional FTA with exports of manufactured products from industries like beer, and meal and flour of wheat. Angola and the DRC, the two countries with the highest comparative disadvantage for agriculture in the region, lose from the agreement as they import products from protected industries like wine, beer, meal and flour of wheat; preparation of cereals, sugar and bakery products.

We conclude that given the pre-FTA level of protection in agriculture, inefficient agricultural producers with a regional comparative advantage for agriculture are the countries to benefit the most from the agreement. Exports from these countries generate trade diversion in importing markets that in most cases cannot be compensated for by trade creation from eliminating tariffs. Countries with regional comparative disadvantage for agriculture like Angola and the DRC are not able to compensate with their own exports for the negative effects of opening their markets to inefficient exporters and therefore the impact of a FTA on welfare is negative. The decision of these countries not to participate in a FTA in SADC is justified by these results, at least in the case of agriculture. These results highlight the importance of reducing tariffs that regional exporters impose on the rest of the world to reduce trade diversion and increase benefits for consumers in countries that face output contraction as a consequence of the agreement. The results also draw attention to the planned customs union for SADC and how the determination of the common tariffs could affect the outcome of this agreement in terms of agriculture's efficiency and the welfare of different countries.

Table 5.11. Other countries: net welfare gains in industries facing reduced protection as a result of eliminating tariffs between SADC countries

SITC	Industries	Angola	DRC	Mauritius	SACU	Total	Share %
0470	Meal & flour of cereals exc. wheat or meslin	-304	-193	0	11,341	10,845	26.2
1123	Beer including ale, stout, porter	-1,397	0	7,260	4,955	10,818	26.1
0460	Meal and flour of wheat or of meslin	-1,106	-660	9,261	-6	7,490	18.1
0611	Raw sugar, beet & cane	0	-406	4,881	101	4,576	11.0
0440	Maize (corn),unmilled	0	0	0	4,298	4,298	10.4
0483	Macaroni, spaghetti, noodles, vermicelli etc.	0	0	739	1,374	2,113	5.1
4312	Hydrogenated oils and fats	0	27	0	2,081	2,107	5.1
0741	Tea	0	138	0	1,395	1,532	3.7
2631	Raw cotton, other than linters	0	0	0	1,082	1,082	2.6
0813	Oil seed cake & meal & other veg. oil residues	0	0	0	885	885	2.1
0481	Cereal grains, flaked, pearled	0	0	-320	1,048	727	1.8
0730	Chocolate & other food prep. of cocoa	0	-224	-385	1,227	617	1.5
4313	Acid oils, fatty acids and solid residues	0	0	525	0	525	1.3
0459	Cereals, unmilled, nes	0	0	0	503	503	1.2
0814	Meat & fish meal, unfit for human consumption	0	0	0	502	502	1.2
0541	Potatoes, fresh, not including sweet potatoes	-228	0	0	702	474	1.1
1223	Tobacco, manuf. for smoking, chewing snuff	450	0	0	5	454	1.1
0620	Sugar confectionery & other sugar preparations	0	-486	0	58	-428	-1.0
0545	Other fresh vegetables	0	-107	-353	-27	-487	-1.2
0422	Rice, glazed or polished, not further prepared	0	0	-974	318	-656	-1.6
0542	Beans, peas, lentils & leguminous veg., dried	-686	-107	0	0	-793	-1.9
0488	Preparations of cereals, flour & starch for food	3	-979	0	0	-977	-2.4
0612	Refined sugar & other prod. of refining, no syrup	0	-346	-675	-137	-1,158	-2.8
0484	Bakery products	0	-445	-1,029	77	-1,397	-3.4
1121	Wine of fresh grapes including grape must	-8,493	0	-1,615	5,187	-4,920	-11.9
	Other	-1,324	294	-1,106	4,820	2,684	6.5
	Total	-13,085	-3,494	16,208	41,787	41,417	100.0

Source: Authors' calculation based on UN Comtrade data.

6. Conclusions and Policy Implications

In this study we assess the potential welfare impacts of a FTA on the agricultural sector of southern African countries and determine opportunities and challenges faced by the region as a consequence of the agreement. We first analyse the characteristics of the current agricultural trade of SADC countries identifying the 10 leading agricultural industries with the largest export or import values for each SADC country between 2000 and 2005. With a few exceptions, agricultural exports are concentrated in a small group of industries; imports on the other hand, are more diversified than exports. There are ten countries for which the top-10 industries represent more than, or close to, 90 per cent of total agricultural exports. In contrast, there are only two countries, for which the top-10 industries represent 80 per cent of their agricultural imports. There is also some preliminary evidence of structural change in both exports and imports, while the import structure seems to be more dynamic than the export structure.

Looking at the list of top-10 exporting agricultural industries for the 14 SADC countries we find a total of 92 different agricultural export industries. The 10 major export industries in the region are tobacco; fish, fresh, chilled or frozen; raw sugar, beet & cane; wine of fresh grapes and grape juice; crustacean and molluscs, fresh, chilled; oranges, tangerines and clementines; grapes; fresh fruit; wood, simply shaped or worked; and raw cotton. These industries account, on average, for $5.5 billion in exports annually, and for 51 per cent of total SADC agricultural exports in 2000–2005.

Although imports are relatively diverse across SADC countries, the total number of different top-10 import industries is 71, smaller than the number of top-10 export industries (92). The 10 major import industries in the region are rice; wheat; food preparations; maize; palm oil; poultry; soya bean oil; cotton yarn and thread; distilled alcoholic beverages; and meal and flour of wheat. Annual value of imports of these 10 industries in 2000-2005 was $2 billion, equivalent to 32 per cent of total agricultural imports. Almost all SADC countries (12 of 14) are major importers of cereals (rice, wheat and maize), which account for 14 per cent of SADC's total agricultural imports.

We also analyse the characteristics of markets that are the final destination of agricultural exports from SADC countries. As in the case of export industries, export markets are also very concentrated. The top-10 partners importing from SADC absorbed more than 90 per cent of SADC agricultural exports from the region as whole, as well as exports from most individual countries. Moreover, we find that market concentration is related to the low diversification of exports. Countries with more diversified exports (for example, Zambia), also have more diversified import markets. While the share of intra-regional trade has significantly increased in recent years, SADC countries' exports are dominated by extra-regional trade. The EU+EFTA is the most important market for SADC exports, accounting for 45.7 per cent of the region's agricultural exports. Intra-regional trade, with 18 per cent of market share, is the second most important destination for SADC exports and is the major source of agricultural imports for the region, accounting for 31 per cent of these imports. The EU+EFTA still plays a major role as a source of imports for the region accounting for 21 percent of SADC's agricultural imports.

Given the main characteristics and structure of agricultural trade in SADC, what are the implications of an FTA in the region? Which agricultural industries in which countries would face challenges?

Which countries could benefit from the agreement? To answer these questions we employ an ex-ante counterfactual analysis of regional trade liberalisation in SADC using a partial equilibrium approach using bilateral trade data at the SITC 4-digit level. We found this approach to be best suited to dealing with highly disaggregated trade data as used in our study.

Our analysis indicates that while the FTA will have a positive welfare impact for the region as a whole, such benefit is small. We estimate a total value of trade creation of $157 million or 0.92 per cent of current annual agricultural trade of SADC countries, and a net effect between trade creation and trade diversion of $129 million or 0.75 per cent of total agricultural trade. Main factors explaining the relatively small impact of a FTA are the relatively small share of sensitive industries in total trade (below 30 per cent) and the low level of tariffs on agricultural products in most countries (an average of 14.5 percent). These two factors are in part explained by the policies followed by SADC countries in reducing regulation and opening agricultural markets that preceded the launching of a FTA, with part of the benefits of trade liberalisation being realised before a FTA was in place. Also, structural characteristics of SADC countries, like the concentration of agricultural exports among a few commodities and markets, as well as the fact that most SADC countries export a similar group of commodities seems to be a major constraint to the expansion of regional trade and for opportunities of trade creation under a FTA.

At the country level, two-thirds of region-wide welfare gains from agricultural trade liberalisation would go to low-income countries while almost one-third would go to SACU. The largest share of the gains would go to Zimbabwe, SACU, Malawi, Mauritius and Tanzania, while Angola and the DRC would be negatively affected by the agreement. We find that countries that benefit the most are those, like Zimbabwe, with a comparative advantage for agriculture in the region, while still being inefficient producers of regionally traded commodities. The inefficiency of the main regional exporters also explains the negative welfare impacts of the agreement on countries with comparative disadvantage in the region (net importers), like Angola and the DRC. This is because the elimination of tariffs on regional imports in these countries would increase imports of wine, beer, meal and flour of wheat; preparation of cereals, sugar and bakery products from inefficient regional producers, with trade diversion dominating trade creation.

The two main factors explaining the impact of a FTA agreement on producers and consumers in different countries are the inefficiency of exporting countries and that most of the sensitive industries face reduced protection. In most cases, consumers and producers in importing countries lose as a result of trade diversion from regional imports. Producers in exporting countries are not affected, while consumers in exporting countries only benefit when production of exporting industries is protected by tariffs on products from the rest of the world. Consumers in these countries are the ones receiving these benefits, and they result from increased imports from the rest of the world to compensate for production now being exported to the region, instead of being consumed domestically. Most benefits to exporting countries come from exports of: beer, cotton, oilseed cakes, leather, cigarettes, malt, rice, tea, oilseed cake, meal and flour of wheat, and refined sugar. The fact that estimated welfare gains in exporting countries are positive, while they are negative in importing countries shows the importance of regional exports from protected industries in explaining these results.

From a political economy perspective and based only on our comparative static results, it could be inferred that agricultural producers in the region have no direct incentives to join the FTA given that no gains are expected for producers in regionally competitive industries, while producers in protected domestic industries are threatened by output reductions and welfare losses. On the other hand, impacts on the winners of the FTA, consumers in countries with protected industries with a comparative advantage for agriculture in the region, appear to be small.

Industries facing output contraction and increased regional imports as a result of the FTA vary by country but are mostly concentrated in cereals, cereal preparations, live animals and meat, and industries incorporating higher value added, like beverage and tobacco (wine, beer, cigarettes and manufactured tobacco); spices; fresh and frozen vegetables; raw and refined sugar; animal and vegetable oils, hydrogenated oils and fats, and cotton yarn and thread. In SACU, the industries that would be the most affected by a regional trade agreement are: non-alcoholic beverages and fermented beverages; dairy (cheese and curd, milk and cream fresh); tobacco industries (cigarettes, tobacco manufactured); bakery products; natural honey; coffee, tea, cocoa and spices.

In sum, given policy priorities of accelerating growth, increasing income, reducing poverty, and promoting food security in low-income countries, our results suggest that trade policy does not appear to be the most effective means to achieve these goals. This is mainly because of:

- concentration of agricultural exports among a small number of agricultural industries, which greatly reduces the possibilities of increasing welfare from trade liberalisation (just above half of agricultural industries find trade complementarity in the region, representing only one-third of the total value of exports of SADC countries);
- the fact that a FTA could result in a significant amount of trade diversion, opening regional markets to inefficient producers, with no benefits for producers in exporting countries while reducing the welfare of producers in importing countries;
- no major gains are expected for consumers who could instead see their welfare negatively affected by increased imports from inefficient regional producers;
- the small size of regional import markets, which leaves very limited scope for enhanced protection for regional producers. This means that a FTA offers little incentives to agricultural producers in the region.

These results suggest that the region should be looking at regional policies and interventions beyond trade arrangements, such as those targeting investment, agricultural productivity and diversification. With growing productivity and enhanced diversification in agricultural production, regional trade liberalisation could play a much more significant role in achieving main policy goals.

With respect to the future customs union in SADC, results stress the importance of common external tariffs in agriculture. These tariffs should be determined to complement and reinforce regional policies promoting investment and productivity. Our analysis suggests that high common external tariffs resulting from a compromise to protect inefficient industries in some SADC countries could have negative impacts on consumers and would not benefit producers.

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APPENDIX: LIST OF AGRICULTURAL INDUSTRIES

Table A.1 Agricultural industries included in COMTRADE.

Ind.code	Industry description	Ind code	Industry_description
0011	Bovine cattle including buffaloes	0532	Fruit, fruit peel, preserved by sugar
0012	Sheep, lambs and goats	0533	Jams, marmalades, fruit jellies
0013	Swine	0535	Fruit juices and vegetable juices, unfermented
0014	Poultry, live	0536	Fruit, temporarily preserved
0015	Horses, asses, mules and hinnies	0539	Fruit and nuts, prepared or preserved
0019	Live animals chiefly for food	0541	Potato, fresh, not including sweet potato
0111	Meat of bovine animals, fresh, chilled or frozen	0542	Bean, peas, lentils and leguminous vegetables,dried
0112	Meat of sheep and goats, fresh, chilled or frozen	0544	Tomato, fresh
0113	Meat of swine, fresh, chilled or frozen	0545	Other fresh vegetable
0114	Poultry including offals.liver fresh, chilled, frozen	0546	Vegetables, frozen or in temporary preservative
0115	Meat of horses, and hinnies.	0548	Vegetable products, chiefly for human food
0116	Edible offal of animals, fresh, chilled, frozen	0551	Vegetables, dehydrated.
0118	Other fresh, chilled, frozen meat and edible	0554	Flour and flakes of potato, fruits, vegetables
0121	Bacon, ham and other dried, salted,	0555	Vegetables preserved or prepared,
0129	meat and edible offal, dried, salted, smoked	0611	Raw sugar, beet and cane
0133	Meat extracts and meat juices	0612	Refined sugar and other products
0134	Sausages, whether or not in airtight containers	0615	Molasses
0138	Other prepared or preserved meat	0616	Natural honey
0221	Milk and cream evaporated or condensed	0619	Sugars and syrups including artificial honey and caramel
0222	Milk and cream in solid form, blocks or powder	0620	Sugar confectionery and other sugar preparations
0223	Milk and cream fresh	0711	Coffee, green or roasted
0230	Butter	0713	Coffee extracts, essences, concentrates
0240	Cheese and curd	0721	Cocoa bean, raw or roasted
0250	Eggs	0722	Cocoa powder, unsweetened
0311	Fish, fresh, chilled or frozen	0723	Cocoa butter and cocoa paste
0312	Fish, salted, dried or smoked	0730	Chocolate and other food preparations of cocoa
0313	Crustaceans and molluscs, fresh, chilled,	0741	Tea
0320	Fish in airtight containers	0742	Mate
0410	Wheat, unmilled	0751	Pepper and pimento, whether or not ground
0421	Milled or unmilled rice, not further prepared	0752	Spices, excluding pepper and pimento, ground or not
0422	Rice, glazed or polished, not further prepared	0811	Hay and fodder, green or dry
0430	Unmilled barley	0812	Bran, pollard, sharps and other by products
0440	Unmilled maize (corn)	0813	Oil seed cake and meal and other vegetable oil residues
0451	Unmilled rye	0814	Meat and fish meal
0452	Unmilled oat	0819	Food waste and prepared animal feed,
0459	Unmilled cereals,	0913	Lard and other rendered pig and poultry fat
0460	Meal and flour of wheat	0914	Margarine, lard and prepared edible fats
0470	Meal and flour of cereals except wheat	0990	Food preparations,
0481	Cereal grains, flaked, pearled	1110	Nonalcoholic beverages,
0482	Malt including malt flour	1121	Wine of fresh grapes including grape
0483	Macaroni, spaghetti, noodles, vermicelli, etc.	1122	Cider and fermented beverages,
0484	Bakery products	1123	Beer including ale, stout, porter
0488	Preparations of cereals, flour and starch for food	1124	Distilled alcoholic beverages
0511	Oranges, tangerines and clementines	1210	Tobacco, unmanufactured and scrap
0512	Other citrus fruit	1221	Cigars and cheroots
0513	Bananas including plantains, fresh	1222	Cigarettes
0514	Apples, fresh	1223	Tobacco, manufactured
0515	Grapes, fresh	2111	Bovine and equine hides excluding calf and kips
0517	Edible nuts, fresh or dried	2112	Calf skins and kips
0519	Fresh fruit	2114	Goat skins and kid skins

0520	Dried fruit, dehydrated artificially	2116	Sheep and lamb skins, with the wool on
2117	Sheep and lamb skins, without wool	2924	Plants, seeds, flowers
2118	Waste and used leather	2925	Seeds, fruit and spores for planting
2119	Hides and skins	2926	Bulbs, tubers, rhizomes and flowering plants
2120	Fur skins, undressed	2927	Cut flowers and foliage
2211	Groundnuts, peanuts green, flour and meal	2929	Materials of vegetable origin
2212	Copra, flour and meal	4111	Oils of fish and marine mammals
2213	Palm nuts and kernels	4113	Animal oils, fats and greases, excluding lard
2214	Soybean	4212	Soybean oil
2215	Linseed	4213	Cotton seed oil
2216	Cotton seed	4214	Groundnut, peanut oil
2217	Castor oil seed	4215	Olive oil
2218	Oil seeds, oil nuts and oil kernels	4216	Sunflower seed oil
2219	Flour and meal of oil seeds, nuts, kernels, fat	4217	Rape, colza and mustard oils
2311	Natural rubber and similar natural gums	4221	Linseed oil
2411	Fuelwood and wood waste	4222	Palm oil
2412	Wood charcoal	4223	Copra oil
2421	Pulpwood, including broad-leaved	4224	Palm kernel oil
2422	Sawlogs and veneer logs (conifer)	4225	Castor oil
2423	Sawlogs and veneer logs (non-conifer)	4229	Fixed vegetable oils
2431	Railway sleepers	4311	Animal, vegetable oils, boiled, oxidized, dehydrated
2432	Lumber, sawn, planed, etc. (conifer)	4312	Hydrogenated oils and fats
2433	Lumber, sawn, planed, etc. (non-conifer)	4313	Acid oils, fatty acids and solid residues
2440	Cork, raw and waste	4314	Waxes of animal or vegetable origin
2611	Silkworm cocoons suitable for reeling	5129	Other organic chemicals
2612	Unreelable cocoons and cocoon wastes	5511	Essential oils and resinoids
2613	Raw silk, not thrown	5995	Starches, inulin, gluten, albuminous substances, glues
2621	Wool of sheep and lambs, greasy	6113	Calf leather
2622	Wool of sheep and lamb (wool, degreased)	6114	Leather of other bovine cattle and equines leather
2623	Fine animal hair, wool	6119	Leather
2625	Horsehair and other coarse hair, not carded/combed	6311	Veneer sheets
2626	Wool shoddy	6312	Plywood, including veneered panels
2627	Wool or animal hair, carded	6314	Improved or reconstituted wood
2628	Wool tops	6318	Wood simply shaped or worked
2629	Waste wool and of other animal hair	6511	Thrown silk and silk yarn and thread
2631	Raw cotton, other than linters	6512	Yarn of wool and animal hair
2632	Cotton linters	6513	Cotton yarn and thread, gray, not mercerized
2633	Cotton waste, not carded or combed	6514	Cotton yarn and thread, bleached, dyed, mercerized.
2634	Cotton, carded or combed	6515	Yarn and thread of flax, ramie and true hemp
2640	Jute and waste	6519	Yarn of textile fibers, including paper yarn
2651	Flax and flax tow and waste		
2652	True hemp and true hemp tow and waste		
2653	Ramie and ramie noils and waste		
2654	Sisal and other fibers of the agave family		
2655	Manila fiber and manila tow and waste		
2658	Vegetable textile fiber, and waste		
2711	Natural fertilizers of animal/vegetable origin		
2911	Bones, ivory, horns, hooves, claws and similar prod.		
2919	Materials of animal origin		
2921	Plants used in dyeing and tanning		
2922	Natural gums, resins, balsam and lacs		
2923	Vegetable materials used for plaiting		

Ind.= Industry.

Source: UN-COMTRADE.

APPENDIX: METHODOLOGY

A.1 Indexes of Revealed Comparative Advantage and Disadvantage

An RCA index for commodity ***i*** in country k is defined as the ratio of the share of this commodity in total exports from k (x_i^k) and the share of exports of ***i*** in total exports of a reference group of countries (x_i^R).

$$RCA_{ik} = \frac{x_i^k}{x_i^R}$$

Similarly, an RCD index for commodity ***i*** in country k is the ratio of the share of k's imports of this commodity in total imports to k (m_i^k) and the share of ***i***'s imports in total imports of a reference group of countries (m_i^R):

$$RCA_{ik} = \frac{m_i^k}{m_i^R}$$

A.2 Trade Complementarity, sensitive industries and protection regimes

Formally, the set of industries showing complementarity in SADC (TCI) is defined as:

$$TCI^{AB} = \left\{ i \in \frac{C}{RCA_i^B} > 1 \text{ and } RCD_i^A > 1 \right\} \text{ with } \mathbf{A} \neq \mathbf{B}$$

where A and B are importing and exporting SADC countries respectively.

The group of sensitive industries is a subset of the set of industries showing trade complementarity. This is the set of industries with regional trade complementarity and protected by tariffs. We use ad valorem equivalent measure of tariff duties and tariff rate quotas at the six-digit level of the harmonised system (5,111 products) from Bouët et al. (2004) to determine industries in SADC countries protected by tariffs. As in Vaillant and Ons (2003), we consider that an industry ***i*** is sensitive when:

- The industry belongs to the group of industries with regional trade complementarity;
- Country B in SADC exports products of industry ***i***
- Country A in SADC imports products of industry ***i***
- A's imports of products of industry ***i*** coming from country B face an ad valorem tariff different from zero.

Industries are not sensitive if the exporting country faces a zero tariff before the FTA comes into force. Sensitive industries are then defined as:

$$SI^{AB} = \left\{ i \in S \in \frac{C}{X_i^B} > 0, \text{ and } M_i^A > 0, \text{ and } t_i^{AB} > 0 \right\} \text{ with } \mathbf{A} \neq \mathbf{B}$$

The group of industries facing reduced protection is a subset of the set of sensitive industries with the following characteristics:

- The industry in country A (importer) is threaten by the FTA. This means that as a consequence of the FTA, domestic production of i in A is displaced by imports:

  $$THI^{AB} = \left\{ i \in \frac{K}{\square}\ i \in S \text{ and } X_i^{A\text{-}FTA} < X_i^A \right\}$$

- Industry ***i*** does not offer a trade opportunity to exporter B, meaning that production in B would not be affected by the FTA.

As the set of industries offering trade opportunities to B is defined as:

$$OP^{AB} = \left\{ i \in \frac{U}{i} \in S \text{ and } X_i^{B\text{-}FTA} > X_i^B \right\}$$

then, industries facing reduced protection (RPI) are those that:

$$RPI^{AB} = \left\{ i \in \frac{RP}{i} \in \text{K and } i \notin U \right\}$$

Industries with enhanced protection on the other hand are those industries ***i*** that:

$$EPI^{AB} = \left\{ i \in \frac{EP}{i} \notin \text{K and } i \in U \right\}$$

A.3 Trade regimes

Given the the previous definitions, industries expected to face reduced protection in importing SADC markets (A) are those for which import demand at exporter's prices is smaller than exporter's supply at the same prices:

$$1 > \frac{P_i^B m_i^A(P_i^B)}{P_i^B X_i^B(P_i^B)}$$

Industries expected to face increased protection as a result of regional trade liberalisation are those for which the ratio of import demand at importer's price and the value of exporter's supply at importers price is bigger than 1:

$$1 < \frac{P_i^A m_i^A(P_i^A)}{P_i^A X_i^B(P_i^A)}$$

Finally, intermediate industries are those where:

$$1 > \frac{P_i^B m_i^A(P_i^B)}{P_i^B X_i^B(P_i^B)} \quad \text{and} \quad 1 < \frac{P_i^A m_i^A(P_i^A)}{P_i^A X_i^B(P_i^A)}$$

Because of limited information on supply and supply elasticities of industries at this level of disaggregation we were able to classify sensitive industries in two groups: one group of those industries facing reduced protection and a second group with all other industries (enhanced protection and intermediate). We did this by estimating the ratio between import demand of a particular industry ***i*** in SADC importing markets (A) and the aggregate value of supply in the group of SADC countries exporting products from that industry (B) both at exporter's price. As in Vaillant and Ons (2003), the value of import demand at exporter's price is calculated using observed values as:

$$P_i^B m_i^A(P_i^B) = \frac{P_i^A m_i^A(P_i^A)}{\Theta^{AB}}\left(1 + \left(\frac{1}{\Theta^{AB}} - 1\right)\epsilon_i^A\right)$$

where $\Theta^{AB} = P_i^A / P_i^B$ is a measure of relative efficiency between the importer A and the exporter B and ϵ_i^A is the import elasticity in A[12].

For those industries for which the value of import demand at exporter's price was smaller

[13]Derived from a simple calculation using import demand elasticity:

$$P_i^B m_i^A(P_i^B) = P_i^A m_i^A(P_i^A) \text{ x } \left[(P_i^A - P_i^B)/P_i^A\right] \text{ x } \epsilon_i^A$$

than exports from the region there was no need to determine supply in exporting countries. In those cases where the value of imports is bigger than exports, we used data of supply from different sources depending upon the industry. For basic agricultural products, information was collected from the FAOSTAT (FAO 2008) database. For processed manufactured products, we used production data from similar industries from the GTAP database (Dimaranan et al. 2006). Because of the lack of information on production for some of the industries we relied on information on production of similar industries as a proxy for the missing values.[13]

[14]To check how this constraint might have affected the allocation of sensitive industries among industries with reduced protection and other industries we estimated the ratio of import demand at export prices and supply at current prices using exports as a proxy for supply. Allocation of industries using exports as a proxy for supply results in 52 of the 85 sensitive industries showing an import/export ratio lower than one (61 per cent of all sensitive industries). Of the 33 industries with import/export ratio greater than one, there are 16 industries with ratios bigger than 2 and tariffs bigger than 10 per cent, and for only 13 of these industries we used data from similar or more aggregated industries to estimate supply. We conclude that inaccuracies in supply estimates for lack of data should not have a significant effect on our results.

APPENDIX: INDUSTRIES SHOWING ENHANCED PROTECTION IN A FTA

The last group of industries included in tables 5.1 and 5.2 is that of industries that would enhance protection or would be the intermediate case where prices in import markets after regional trade liberalisation would fall below prices in less efficient importers and above prices of the most efficient exporters. Exporters to these markets could benefit from higher prices given that regional exports would be lower than imports. This implies that importers would continue to buy from the ROW imposing tariffs, with regional exporters benefiting from higher prices in these markets. The table below presents industries in this group. Exporters can expect to benefit from the trade agreement through enhanced protection in only nine of a total of 193 agriculture-related industries,. Most tariffs in these industries are low, so big gains for exporters of these industries are not expected. Only Zimbabwe with no tariff in sugar confectionery could benefit from a 24 per cent tariff in SACU and a 20 per cent tariff in other import markets (Malawi).

Table A.2 Industries facing enhanced protection in other countries as a result of eliminating tariffs between SADC countries

STIC code	Industry	Imports			Tariffs		Exports			Exporters
		Total	Share SACU	Share Other	Average SACU	Average Other	Total	Share SACU	Share Other	
0113	Meat of swine, fresh, chilled or frozen	31,523	72.6	27.4	10.9	10.0	2,561	3.1	96.9	MOZ, ZBW , SACU
0116	Edible offals of animals, fresh, chilled, frozen	10,177	0.0	100.0	5.1	11.8	835	100.0	0.0	SACU
0121	Bacon, ham & other dried, salted, smoked pig meat	2,864	1.9	98.1	14.9	17.5	616	39.5	60.5	ZBW, SACU
0129	Meat & edible offals, nes. Dried, salted, smoked	5,202	0.0	100.0	0.0	10.0	62	27.0	73.0	ZBW, SACU
0240	Cheese and curd	6,385	9.4	90.6	94.7	12.5	6,095	95.1	4.9	MAU, SACU
0421	Rice in the husk or not, not further prepared	3,196	0.0	100.0	0.0	10.2	677	27.6	72.4	MWI, TZA, SACU
0422	Rice, glazed or polished, not further prepared	104,327	0.0	100.0	0.0	12.2	10,448	81.6	18.4	MWI, TZA, SACU
0430	Barley, unmilled	1,593	0.0	100.0	0.0	13.6	200	0.0	100.0	TZA, ZBW
0460	Meal and flour of wheat or of meslin	106,013	0.3	99.7	5.1	10.1	20,507	0.1	99.9	MAU, MOZ, TZA, ZBA, ZBW, SACU
0470	Meal & flour of cereals exc. wheat or meslin	65,945	1.8	98.2	3.0	14.9	35,385	94.4	5.6	TZA, SACU
0483	Macaroni, spaghetti, noodles, vermicelli etc.	20,364	0.0	100.0	0.0	7.3	2,175	54.0	46.0	MWI, MAU, SACU
0914	Margarine, imitn lard & preprd edible fats nes	28,543	1.0	99.0	10.0	16.9	9,936	68.3	31.7	ZBW, SACU
1123	Beer including ale, stout, porter	79,880	0.8	99.2	4.2	27.5	21,368	71.0	29.0	MAU, ZBW, SACU
4312	Hydrogenated oils and fats	13,350	2.5	97.5	5.2	16.8	6,039	96.6	3.4	TZA, SACU
4313	Acid oils, fatty acids and solid residues	29,742	77.7	22.3	10.0	9.2	3,050	91.3	8.7	MDA, MWI, MAU
6114	Leather of other bovine cattle & equine leather	58,127	100.0	0.0	8.1	-	15,913	44.6	55.4	ZBW, SACU
	Other	175,380	79.5	20.5	-	-	26,177	17.9	82.1	-
	Total	742,611	33.3	66.7	-	-	162,043	57.2	42.8	-

Source: Authors' calculation based on UN Comtrade data.

The Regional Strategic Analysis and Knowledge Support System (ReSAKSS) is an Africa-wide network that provides analysis, data, and tools to promote evidence-based decision making, improve awareness of the role of agriculture for development in Africa, fill knowledge gaps, promote dialogue and facilitate the benchmarking and review processes associated with the AU/NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP) and other regional agricultural development initiatives in Africa.

ReSAKSS SA Southern Africa

Regional Strategic Analysis and Knowledge Support System

For more information, contact

Subregional Coordinator
Regional Strategic Analysis and Knowledge Support System in Southern Africa (ReSAKSS-SA)
Private Bag X813
Silverton 0127
Pretoria, South Africa
Telephone: +27 (0)12 845 9100
Facsimile: +27 (0)12 845 9110
E-mail: resakss-sa@cgiar.org
Website: www.sa.resakss.org