Chapter 13

Regional Integration and Employment Effects in SADC

Mina Mashayekhi, Ralf Peters and David Vanzetti*

UNCTAD

The African Union (AU) is pursuing an integration agenda for the African continent. Trade is seen as an important element to create productive employment and to reduce poverty. The Southern African Development Community (SADC) is one of the regional economic communities recognised by the AU as building blocs and comprises 15 countries with the common objective of regional integration. Trade between the member countries is relatively high compared to other regions in Africa and is disproportionately high in processed and more sophisticated products. Employment effects of further regional integration are assessed using a global general equilibrium model. Using data on skilled and unskilled labour use by sector, an assessment is made of the likely employment impacts within the region. The results vary considerably across countries and sectors, particularly in the sugar, textiles, motor vehicles, electronics and manufacturing sectors. Further regional integration is expected to increase real wages and/or employment, although once again to varying degrees across countries. Some countries have high tariffs on textiles, some manufactured goods and wood and paper products and would face substantial structural adjustment if these tariffs were eliminated. Workers in these industries would be obliged to seek work in the service sector. The results emphasise the essentially positive effect of regional integration in SADC and the importance of labour market policies to complement trade policies in order to address employment concerns.

* The views expressed are those of the authors and do not necessarily reflect those of the UNCTAD or partners of the ICITE initiative. David Vanzetti is also affiliated to Australian National University. Contact: Ralf.Peters@unctad.org

13.1. Introduction

The African Union (AU) Summit of Heads of State and Government in January 2012 focused on the theme of "Boosting Intra-Africa Trade". Africa is pursuing an integration agenda as a collective development and transformation strategy leading to the eventual creation of a continental market. In 2012, Heads of State agreed to establish a Continental Free Trade Area by 2017 with the option to review to target date according to progress made. Trade is seen as an important element to create productive employment and to reduce poverty.[1] Currently, intra-Africa trade is only 10% of the continent's total trade. To facilitate convergence towards achievement of a continental common market AU Heads of State recognised eight regional economic communities as building blocks. The Southern African Development Community (SADC) is one of these eight regional communities.

SADC comprises 15 countries with the common objective of regional integration. The 15 countries are Angola, Botswana, Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe. Some members have eliminated or reduced their tariff barriers between the member countries as early as 2000. Compared with other regional economic communities in Africa, the share of intra-SADC trade at 11% of the region's total trade is relatively high.

Not so obvious are the associated employment effects. One of the challenges for policy makers is to increase productivity without increasing unemployment. At a sectoral level it is clear that employment in some sectors has fallen as a result of integration while it has increased in others. This is desirable if displaced workers are able to gain employment in more productive sectors, but less desirable if it leads to an extended period of unemployment, or employment in a less productive sector. McMillan and Rodrik (2011) warn that structural change in Africa has been growth reducing in recent decades with labour moving into low productivity sectors.

Recently, a renewed interest in regional integration among southern countries and south-south trade in general has emerged. Prominent in the discussion is the different composition of the export baskets of regional and global exports. Some developing countries export more sophisticated products to the south while exports to the north are often dominated by raw materials. With regional integration efforts in the south like SADC, it is hoped that the associated trade creation contributes to positive structural change.

The purpose of this note is to examine the trade, output and employment effects of regional integration in the SADC region. While trade and tariff data are readily available, there is relatively little information on non-tariff barriers and employment in each sector. South Africa and some other SADC countries started already in 2000 to reduce preferential tariffs on imports from SADC. Others only started to reduce tariffs in 2008 and tariffs on sensitive products remained. We assess the impact of actual and potential further liberalisation since 2008. The GTAP (Global Trade Analysis Project) model, a global computable general equilibrium (CGE) model, is used to analyse the effects of the regional integration. The modelling is based on input-output tables, derived from national accounts that specify the use of labour, capital, land and intermediate inputs in the production of final goods.

The next section provides a review of SADC's objective and implementation and of data on trade and employment in the SADC member countries. Section 13.3 outline data and methodologies for analysing these effects. This involves using a general equilibrium model to

1. See, for example, AU "Declaration on Employment and Poverty Alleviation in Africa", AU Summit 2004.

identify the likely employment effects of trade liberalisation. A regional integration scenario is described, and the results of simulations are presented and discussed in Section 13.4. Implications are drawn in the final section. The conclusion from the CGE modelling is that trade is beneficial for employment, but the effects are uneven. Policies that promote internal migration, both within member countries and within SADC as a whole, could be beneficial. We conclude that labour market policies are important to complement trade policies in order to address labour market concerns.

13.2 Background of SADC

SADC, formerly known as the Southern African Development Coordination Conference (SADCC) which was established in 1980, aims to strengthen socio-economic cooperation and integration as well as political and security cooperation of southern African states. Main objectives of SADC comprise achieving development and economic growth, alleviating poverty, promoting employment, enhancing the standard and quality of life, and supporting the socially disadvantaged through regional integration. To achieve these objectives, SADC shall inter alia support development of economic, social and cultural ties across the region, and of policies aimed at the progressive elimination of obstacles to the free movement of capital, labor, goods and services.

Integration in the SADC region is also an important component for Africa's continental integration.[2] Trade liberalisation leading to the formation of regional free trade areas, and progressing towards customs unions and common markets, would serve as stepping stones for the formation of a continental African Common Market and Economic Community. The decision and desire of African countries for achievement of continental integration through trade, economic, social and culture spheres has been embodied in the 1980 Lagos Plan of Action, the 1991 African Economic Treaty and the 2000 Constitutive Act of the African Union adopted by African countries. In a bid to bring about greater rationalisation among Africa's multiple regional and sub-regional groupings, the AU Heads of States recognised eight regional economic communities as building blocks to facilitate convergence towards achievement of a continental common market and economic community. SADC has been recognised as one of these building blocks for continental integration.

The progress in establishing a free trade area (FTA) or customs union attained so far by the eight regional economic communities has been mixed. SADC does not belong to the groups having made the most progress such as the Common Market for Eastern and Southern Africa (COMESA) and the Economic Community of West African States (ECOWAS); nor does it belong to those making limited progress such as Arab Maghreb Union (AMU). Only limited steps have been made across Africa to implement the commitments in the regional economic communities for elimination of non-tariff barriers (NTBs), adoption of common external tariffs and common policies.

The SADC regional integration programme includes the establishment of the FTA by 2008, a Customs Union by 2010, a Common Market by 2015 and later a monetary union and a single currency. The free trade area in SADC was launched on time in 2008, with all member states (except Seychelles, Angola and DRC), removing tariffs on 85% of their products. The remaining 15% consisted of sensitive products, and tariffs on these were scheduled to be liberalised by 2012. Early in 2009, SADC member States decided to postpone the 2010 target for establishing a customs union. Some member States expressed inability to phase down tariffs on sensitive products by the target date of 2012, owing to negative effects on their economies of

2. This section is based on UNCTAD and AU (2012).

the global economic crisis. Thus, while SADC has largely achieved a free trade area in goods, and is negotiating a services agreement, there are doubts about its ability to pursue the implementation of monetary union and a single currency by the due dates.

SADC trade integration also faces challenges derived from overlapping memberships of several member States in COMESA, the East African Community (EAC), the Southern Africa Custom Union (SACU) or the Economic Community of Central African States (ECCAS). To address issues of overlapping membership and to ensure harmony in regional integration, the Tripartite Summit between SADC, COMESA and EAC was set up. In 2008, there was an agreement on a single free trade agreement covering the 26 member countries. In 2012, Heads of State at the African Union summit decided to finalise the Tripartite FTA initiative by 2014. This zone would cover more than half of Africa's population and account for more than half of its GDP.

Economic situation and implementation

The fifteen SADC member countries have a population of 253 million with a GDP of USD 564 billion. Regional integration in Southern Africa is characterised by the dominance of South Africa, which accounts for about two-third of SADC's GDP. SADC comprises a diverse group of countries with a GDP per capita reaching from USD 201 in DRC and USD 408 in Mozambique to USD 7 255 in South Africa, USD 7 403 in Botswana and USD 7 488 in Mauritius.[3]

The overall contribution of economic activities to GDP in SADC is dominated by South Africa's economic structure, which is relatively strong in manufacturing. In SADC as a whole, agriculture contributes 9%, industry (including mining) 36% and services 55%. Generally in Africa, agriculture contributes more to GDP (17% overall). Beyond South Africa, within SADC there is considerable variation among the member States. In DRC, agriculture contributes 43% to GDP and manufacturing only 5%. On the other extreme is Mauritius with a contribution of 4% from agriculture and 19% from manufacturing.[4] Commodities play an important role in many SADC countries. For example, Angola exports substantial quantities of oil and Botswana is a major producer of diamonds. With the exception of South Africa and Mauritius, it can generally be stated that the degree of industrialisation is relatively low in SADC countries.

Implementation of the SADC FTA began in 2000 following the signing of the SADC Trade Protocol (in 1996). Among the member States, the liberalisation of tariffs has taken place at different rates. In general, the more developed countries have reduced tariffs at a faster rate. South Africa, Botswana and Namibia removed most tariffs between 2000 and 2005 (Figure 13.1). Other countries such as Mauritius have gradually reduced their tariffs each year between 2000 and 2008. For least developed countries such as Mozambique and Zambia, tariff reductions were generally introduced during 2008-09 (Figure 13.2). Angola and DRC will be joining the FTA in the near future. Table 13.1 shows tariffs of those countries that had not removed their tariffs in 2007, the base period for the scenario analysed here. For these countries, tariffs on imports from within the region are similar to tariffs on imports from outside the region.

As noted above, tariffs are being liberalised in a stepwise fashion with tariffs on sensitive products being reduced later in the process. Sensitive and excluded products include motor

3. *Source*: UNCTADStat, USD at current prices and current exchange rate in 2010.

4. Data based on World Bank Development Indicator 2011, last available year. The 43% in DRC appears high. However, the data show that the economic structure varies significantly in SADC countries.

vehicles of various kinds (Chapter 87, 7.5% to 15% tariffs), vehicle components (Chapter 98, 26% tariffs) and some items of clothing such as worn overcoats (Chapter 63, 60% tariffs).[5] These were scheduled to be removed by 2012, although it is not clear whether this timetable will be met.

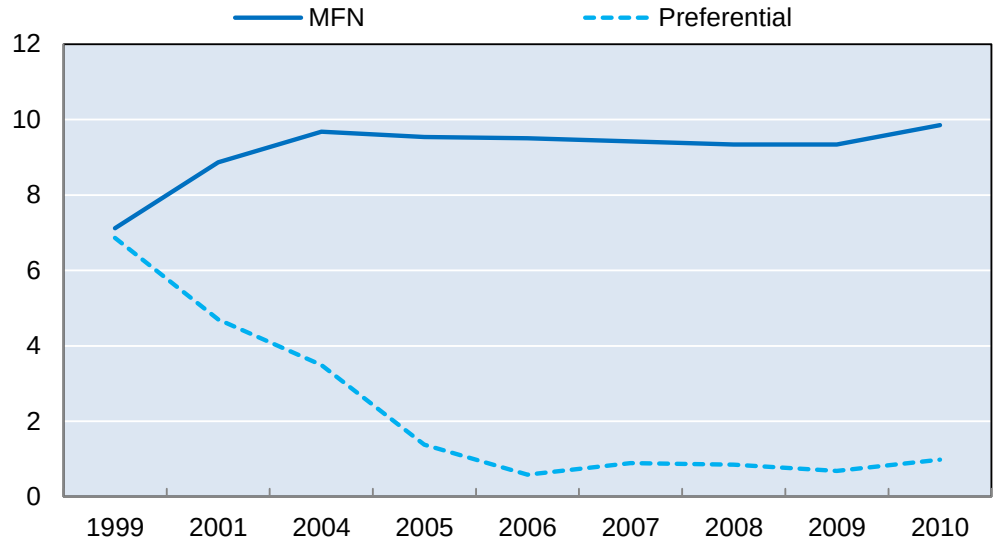
Table 13.1. SADC tariffs in 2007

	Tariffs on imports from SADC countries	Tariffs on imports from non-SADC countries
	%	%
DRC and Angola	9.8	8.0
Mozambique	5.6	8.1
Tanzania	3.8	9.6
Zambia	6.7	7.8
Zimbabwe	15.2	14.8

Source: GTAP v8 database. Trade-weighted applied tariffs.

In 2010, average trade-weighted effectively applied tariffs in SADC on imports from SADC trade partners were 1.4%. MFN tariffs for the same trade basket would be 7.6%. Several countries such as Botswana and Lesotho had basically zero tariffs on imports from SADC. Other countries such as Mauritius and South Africa had very low average trade-weighted tariffs of 0.7% and 0.2%, respectively. Mozambique had reduced its tariffs on imports from SADC to 1.0%. For the other countries in Table 13.1, recent tariff data are not available.[6]

Figure 13.1. Average MFN and SADC preferential tariffs South Africa 1999-2010

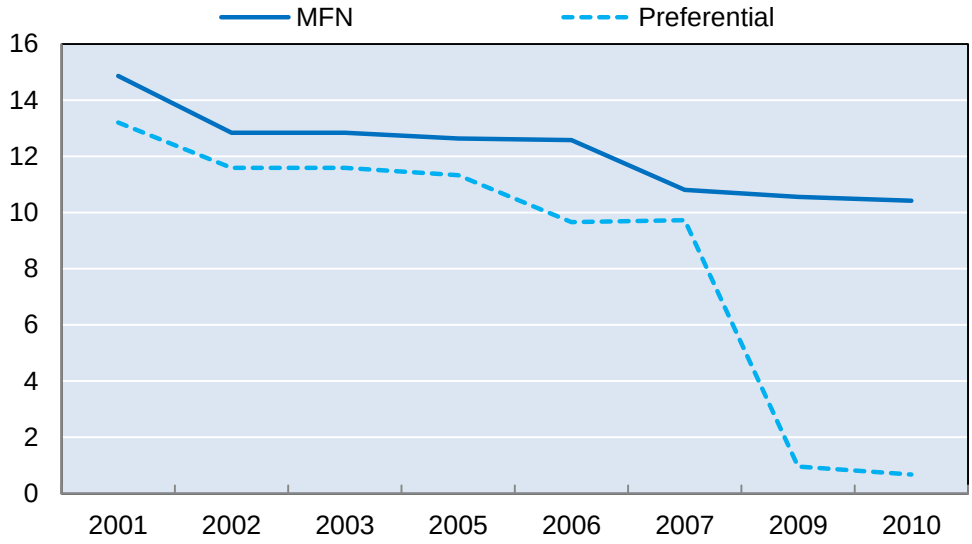


Source: UNCTAD Trains.

5. SADC website on trade: *www.sadctrade.org/*

6. Data in this paragraph are based on UNCTAD Trains data accessed through WITS.

Figure 13.2. Average MFN and SADC preferential tariffs Mozambique 1999-2010



Source: UNCTAD Trains.

Trade

Exports of SADC countries are concentrated on destinations in the European Union and other high income OECD markets though this concentration is diminishing. Exports of non-agricultural products to Brazil, Russia, India and China (BRIC) have increased significantly especially between 2005 and 2010. The share of intra-regional SADC trade in the region's total trade has not changed much during the integration period and reached 11% in 2010 for both intra-SADC exports (Table 13.2) and imports. As noted above, compared with other regional economic communities in Africa this share is relatively high. For example, in COMESA the share is only 6% and in Arab-Maghreb Union (AMU) only 5%. Intra-Africa trade is 10% of total trade for the continent, much lower than, for example, intra-Asia trade which is about 50% (developing counties only), or NAFTA and intra-EU trade. The literature has discussed various reasons for the relatively low intra-Africa trade including low complementarity of production structures, trade barriers, and lack of infrastructure and integration into value chains (e.g. UNCTAD, 2009).

Table 13.2. Total exports from SADC

	2000	2005	2010
	USD billion	USD billion	USD billion
World	52.2	102.1	170.3
	%	%	%
World	100.0	100.0	100.0
SADC	12.6	9.7	10.9
Rest of Africa	2.4	3.1	3.2
European Union	37.9	34.0	23.0
Other high income OECD	27.9	29.2	26.4
BRICs	7.8	13.0	28.8
Rest of the World	11.3	11.0	7.7

Source: UNCTADStat.

Africa's exports are highly concentrated on a few products, mainly primary commodities and some manufacturing. Relative to other regions the high concentration, e.g. measured by a concentration index, is very evident. Even more worrying is the upward tendency in the concentration index (UNCTAD and AU, 2012). The index increased from 0.31 in 2002 to 0.47 in 2008 for Africa as a whole and from 0.18 to 0.35 in SADC, representing a considerable movement towards greater concentration in exports. Similarly, intra-African trade is highly concentrated.

Intra-regional trade is higher for agricultural products than non-agricultural goods (Table 13.3). Nonetheless, agricultural products are still mainly exported to the European Union. Agricultural exports to other high income OECD countries and to BRIC countries are low. These markets attract relatively higher shares of non-agricultural exports. The United States, for example, imports relatively labour intensive textile products from the SADC region, often under its preferential market access programme AGOA. The category "non-agriculture" as defined in the WTO also comprises minerals and other raw materials that are often relatively less labour intensive than agriculture and manufactured products.

Export markets vary considerably between SADC members. While more than 60% of Botswana's exports go to the European Union, the comparable EU export shares are much lower for Swaziland, Tanzania and Zambia (Table 13.4).

Overall, world exports are comprised of 12% raw materials, 21% intermediate goods, 31% consumer goods and 31% capital goods. SADC exports are much more concentrated on raw material (29%) and intermediate goods (41%) than on consumer and capital goods (17% and 12%, respectively). Compared to trade with non-SADC partners, trade within SADC is relatively high in intermediate, consumer and capital goods (Annex Table 13.A1.1).[7] Interestingly, von Uexkull (2012, this volume) finds that at the firm level, regional exporters are similar to global exporters in terms of employment, productivity and wages.

Table 13.3. SADC exports in agriculture and non-agriculture in 2010, by destination

	Agriculture	Non-agriculture
	USD billion	USD billion
World	17.2	153.1
	%	%
World	100.0	100.0
SADC	17.3	10.1
Rest of Africa	5.5	2.9
EU	40.2	21.1
Other high income OECD	12.5	28.0
BRICs	9.8	31.0
Rest of the World	14.7	6.9

Source: UNCTADStat.

7. ILO, 2010 analysis the effects of integration in the ECOWAS region and uses a similar methodology. They also find different revealed comparative advantages by trading partners.

Table 13.4. Total exports by country and distribution by destination, 2010

	World	SADC	Rest of Africa	European Union	Other high income OECD	BRIC	Rest of world
	USD billion	%	%	%	%	%	%
Angola	46.4	4.6	0.2	8.5	32.0	53.5	1.2
Botswana	4.7	18.8	0.0	61.0	12.0	1.8	6.3
Democratic Republic of the Congo	4.9	25.5	0.5	12.5	11.1	49.3	1.1
Lesotho	1.2	6.5	0.0	11.7	81.8	0.0	0.1
Madagascar	1.3	4.3	2.3	56.4	18.1	12.3	6.6
Malawi	1.1	19.4	12.1	36.7	17.5	5.3	8.9
Mauritius	2.0	7.9	8.4	61.7	16.1	1.5	4.4
Mozambique	2.2	19.6	0.3	63.1	0.2	9.1	7.8
Namibia	6.0	17.0	0.4	38.5	24.6	12.5	7.0
Seychelles	0.4	8.1	4.1	63.0	10.6	2.2	12.0
South Africa	85.8	10.3	4.8	28.0	24.4	20.8	11.7
Swaziland	1.8	13.5	11.3	25.6	31.2	4.1	14.3
United Republic of Tanzania	4.1	13.0	13.3	17.3	15.2	26.3	14.9
Zambia	7.2	18.3	1.7	4.4	51.6	20.5	3.6
Zimbabwe	2.5	54.7	1.2	20.3	7.9	8.3	7.8
SADC	170.3	10.9	3.2	23.0	26.4	28.8	7.7

Source: UNCTADStat.

Composition of trade

Regional export baskets can differ substantially from global trade. A major interest in regional integration among southern countries and south-south trade more generally is that it is considered as a step towards industrialisation, which could lead to the creation of productive employment. According to the Heckscher-Ohlin model north-south trade leads to the specialisation of the south in products that are intensive in its abundant factors, land and unskilled labour, while the north specialises in goods that are intensive in human and physical capital. Such a specialisation it is often argued would prevent developing countries from industrialisation. South-south trade, however, could lead to exports of more sophisticated products that contribute to structural change.

An indicator for the sophistication of products has been developed by Rodrik and Hausmann (2006). The index "Prody" measures the sophistication of a country's export package by comparing it essentially with the GDP per capita associated with the basket. Hausmann, Hwang and Rodrik (2007) show that a country's relative level of export sophistication has an impact on subsequent growth: the higher the level of sophistication, the higher the growth rates. South-south exports were initially associated with greater skill content and higher sophistication than exports from the south to the north (e.g. Amsden, 1976 and subsequent literature). However, more recent studies show that the opposite is possible (OECD, 2006). For example China imports a lot of raw material from Africa (south-south) and exports more sophisticated consumer goods to the United States.

Linking the Prody index with SADC's intra-regional and external trade reveals that the intra-regional trade appears more sophisticated than external trade.[8] Within trading blocs, the difference in sophistication between intra-bloc and external trade is higher for the poorer countries. Klinger (2009) shows that this is also the case in SACU where South Africa has in fact a higher relative level of sophistication in its outside exports than in its exports to SACU.

Another concept to measure the potential contribution of exports of certain products to future development is the "connectedness". Hidalgo *et al.* (2007) provide a metric that tries to measure the learning potential of goods to develop capabilities for future structural transformation and productivity growth. If a country's export package consists of products that are in the "product space" near to other products, the theory suggests that it is easier to diversify in the near future. Similar to the results for sophistication, poorer developing countries export more connected products to the south than to the north, while this difference is smaller for higher income countries. South Africa, however, exports more connected products to other developing countries than to developed countries (Klinger, 2009).

Thus, there is some indication that regional integration could have a positive impact on structural change in SADC. Other arguments for regional integration are that it provides larger markets that attract foreign direct investment and foster greater competition. This could have a positive impact on growth, which in turn could contribute to create productive employment. The allocation effect, where resources are used more efficiently, could add to the potential growth effect of regional integration. The employment impact of the allocation effect depends directly on the labour intensity in the sectors. The impact of trade liberalisation in SADC on trade flows and employment via the allocation effect is analysed with a general equilibrium model in the next section.

Table 13.5. Labour intensity

	Exports to	
	SADC	**RoW**
Botswana	0.67	0.23
Madagascar	0.22	0.27
Mozambique	0.35	0.22
Mauritius	0.30	0.25
Malawi	0.31	0.26
Tanzania	0.12	0.27
Zambia	0.19	0.07
Zimbabwe	0.18	0.20
South Africa	0.12	0.16
Rest of South African Customs	0.25	0.24
Democratic Republic of the Congo and Angola	0.10	0.14

Source: Calculation based on GTAP 8 data.

The differences in the labour intensity between regional and global exports and changes of the export orientation resulting from regional integration can have a direct impact on employment and poverty alleviation. Export growth of products that use unskilled labour intensively can have a higher poverty reducing effect than export growth of capital intensive

8. The Prody of exports to the world is 13 030 and for exports to SADC 81 428.

products. For SADC, Kweka *et al.* (2004) find that regional integration has led to higher trade and that this trade has a higher anti-poverty impact as it involves the poor more directly.

The composition of exports along the line of sophistication and connectedness or raw materials, intermediate, consumption and capital goods does not determine the labour intensity. Raw materials can be labour intensive (e.g. agricultural products) or capital intensive (e.g. large scale mining). The labour intensity of exports varies across countries. Botswana, for example has a higher labour intensity in its exports to SADC than in its exports to the rest of the world. South Africa's labour intensity of exports is, however, higher for its exports to the rest of the world. Exports of highly labour intensive goods create jobs, though not necessarily high quality jobs. Many agricultural sectors are examples of sectors with a high labour intensity but low productivity and correspondingly low wages. In addition, the number of jobs created by exports of certain goods depends on the level of value added. iPhone exports from China to the United States provide an example for a product with high export value but relatively little value added in the exporting country.

13.3. General equilibrium model analysis: data and methodology

A computable general equilibrium model is an economic model that uses actual economic data to estimate how an economy might react to changes in policy such as a trade policy change. Elasticities capture behavioural responses such as a change in demand resulting from price changes.

Labour-output ratios

Table 13.A1.7 shows labour-output ratios by sector for most SADC members using data taken from the Global Trade Analysis Project version 8 database. These data are based on the value of labour, not numbers of workers, so the value of labour understates the number of workers where wages are below average. The data are taken from input-output tables derived from the national accounts of the individual countries. Although these are the latest numbers available through version 8 of the GTAP database, the primary data vary in terms of timeliness, as the accounts are based on a census taken at intervals.

It is clear that primary agriculture is a labour intensive industry in the SADC region. Mozambique, Tanzania and DRC are examples of countries with high labour-output ratios in primary agriculture. Given that wages are low in the agricultural sector, which is characterised by an informal labour force, it is apparent that labour productivity per worker is low relative to the rest of the economy. Data on the contribution of agriculture to GDP and employment in agriculture as a share of total employment confirm the relatively low productivity. In Mozambique and Zambia, for example, 81% and 72% of employees contribute only 28% and 22% to each country's GDP, respectively.[9] The extractive industries (e.g. mining) have low labour-output ratios. The service industries tend to have relatively high labour-output rations.

One impact of trade on employment operates through changes in output. To the extent that trade influences output, changes in employment can be related to trade. However, there are many other factors affecting output other than trade, such as domestic consumption, production shocks caused by droughts and floods, and a range of domestic policies. In addition, the link between output and employment is not fixed, with wages and interest rates, technology and

9. World Development Indicators, 2011. Data availability for individual countries varies. The reference year for Mozambique is 2003 and for Zambia 2000.

labour market policies having an influence. Therefore, it is difficult to derive a direct link between trade policy, such as regional integration, and employment.

Successful integration into the global economy is part of every development success story of recent decades. Trade allows developing countries to access technologically advanced capital goods and inputs and at the same time extends demand for their export products far beyond the narrow boundaries of the local market. The empirical analysis has, however, difficulties in identifying a clear link between liberalisation and employment creation. McMillan and Verduzco (2011), for example, fail to find a correlation between trade liberalisation and industrial employment over a long period, 1980 to 2006, in a dataset including many developing countries. Hoekman and Winters (2007) conclude in their literature overview that "the direct effects of trade reform on aggregate employment are muted". For OECD countries, it has been shown that neither the share of the working-age population that is employed nor the rate of unemployment are correlated with trade openness. However, other papers including several studies in this volume find a positive correlation and show that trade has a positive impact on employment creation. ICITE is an important initiative helping to shed more light on the relationship.

Methodology

One way to gauge the link between regional integration and employment would be to look at sectoral employment in 2000 before tariff reduction within the region and now, when integration is well advanced. For example, prior to removing tariffs South Africa exported virtually nothing to Namibia and imported USD 200 000 in just 15 of 99 HS chapters, mainly fish (HS chapter 3) and other products of animal origin (HS chapter 5). By 2007, imports amounted to USD 131 million from 27 chapters. However, some 99% of these imports by value were pearls, precious stones, metals, coins, etc. (HS chapter 71). Diversification may have increased, but so had concentration.

Unfortunately, trade data do not tell us much about production and employment. For this we turn to a general equilibrium model that links trade flows to production and the use of labour, capital and land. The link between trade and employment is assessed here by using the GTAP version 8 database with 2007 tariffs and simulating removing the remaining tariffs within the region (i.e. those imposed by the countries listed in Table 13.1 as shown earlier). This shows the expected trade and employment effects in each member country of removing just the tariffs.

The GTAP model is used to measure the impact on real wages and employment of changes in trade policy following regional integration. GTAP is ideal for modelling preferential trade agreements because it contains bilateral trade and tariff data. It is a multi-country and multi-sectoral CGE model and fully documented in Hertel and Tsigas (1997). For each country or region, there are multistage production processes which combine primary factors of land, labour, capital and natural resources with intermediate inputs, assuming a constant elasticity of substitution technology. Returns to factors, i.e. income, are taxed by the government, saved or spent by the single representative household. While there is no substitution between intermediate inputs and primary factors or among the intermediate inputs, there is substitution between different sources of intermediate inputs, namely domestic and imports from each region. The regions are linked together by imports and exports of commodities. Similar commodities, which are produced by different countries, are assumed to be imperfect substitutes

for one another. The degree of substitution is determined using Armington elasticities (the elasticities of substitution between imports and domestic goods).[10]

The degree of substitution between primary factors (capital, labour, land, etc.) varies between sectors, with primary agriculture characterised by low substitutability, and manufacturing much higher. The elasticities are shown in Table 13.6. For a given sector, such as rice, the elasticity is the same between all primary factors and across all countries. The substitutability between labour and capital is the same as between skilled and unskilled labour. Table 13.6 also shows the Armington elasticities.

In this application, the standard model is used with the exception that alternative labour market closures, described below, are used for unskilled labour. Skilled labour and capital are assumed to be mobile in each country but in a fixed supply, with no international mobility. Labour cannot move across borders. This is the standard GTAP assumption.

There is no attempt to phase in the tariff changes or trace the time profile of the impacts. Thus, we only compare the new steady state after the implementation period with the initial status quo. The focus here is on removing the tariffs that were in place in 2007. This includes tariffs that have been removed recently (e.g. in Mozambique), tariffs that still exist in some LDCs, and tariffs on sensitive products that were exempt from immediate reduction. To the extent that those tariffs would not be removed, we overestimate the gains. In the other hand, we ignore non-tariff barriers and other quantitative restrictions such as import bans or quarantine restrictions.

Table 13.6. Elasticity of substitution

	Between primary factors	Between domestic and imported goods
Rice	0.53	3.60
Other crops	0.26	2.78
Vegetables	0.26	1.85
Sugar	0.72	2.70
Plant based fibres	0.26	2.50
Livestock	0.26	2.22
Fishing	0.20	1.25
Resources	0.26	3.32
Meat	1.12	4.15
Other processed agriculture	1.12	2.14
Textiles	1.26	3.82
Wearing apparel	1.26	3.70
Chemicals	1.26	3.30
Metal manufactures	1.26	3.55
Wood & paper products	1.26	3.10
Manufactures	1.26	3.58
Electronics	1.26	4.40

Source: GTAP database V8.

10. More information on the use of Armington elasticities in the GTAP model can be found in several papers on the GTAP consortium web site, here: *www.gtap.agecon.purdue.edu*

Simulations with alternative labour market assumptions

In this analysis we are interested in the labour market effects of trade liberalisation. To gauge this we use three alternative closures or assumptions about how the labour market works. The standard (fixed) closure assumes that the quantity of skilled and unskilled labour in each country is fixed. In other words, there is no change in unemployment. Thus, all the adjustment occurs in real wages. An alternative (flexible) closure assumes real wages of unskilled labour are fixed and the adjustment occurs in employment. The final (rigid) assumption is a combination of the two, with some adjustment in both the price and quantity of unskilled labour. This assumption is undoubtedly more realistic, but it raises the question of what response can be expected. In the absence of definitive data, an elasticity of one is assumed. This means the change in employment in the economy is approximately equal to the change in the real wage. The three scenarios are listed in Table 13.7.

Table 13.7. Estimated impacts for elimination remaining intra-regional tariffs

Scenario	Closure	Assumption
Fixed	Quantity of labour is exogenous	No change in employment
Flexible	Real wages of unskilled labour is exogenous	Surplus unskilled labour is available. No change in skilled labour.
Rigid	Real wages and employment endogenous	Real wages and employment of unskilled labour can adjust

13.4. Results

Regional trade liberalisation among developing countries can lead to increasing or decreasing demand for labour intensive goods and hence the demand for labour can increase or decrease. The effect on wages and employment depends on the labour market structure. If the supply of labour is fixed, an increase in demand is expressed as an increase in real wages. If labour is in surplus, the increase in employment has a significant effect on national welfare (Table 13.8). This is because the resource base of primary factors is expanded, rather than merely reallocated to better use. The flexible scenario generates the greater welfare gains because real wages are fixed and the increase in demand for labour is assumed to be totally accommodated by changes employment rather than in real wages.

Table 13.8. Welfare: estimated annual impacts for elimination of remaining intra-regional tariffs under alternative labour market assumptions

	Fixed	Flexible	Rigid
	USD m	USD m	USD m
Botswana	-12	12	0
Madagascar	-2	-1	-2
Mozambique	156	445	303
Mauritius	-1	4	1
Malawi	-43	-32	-37
Tanzania	-5	8	1
Zambia	-24	34	5
Zimbabwe	425	821	631
South Africa	418	693	555
Rest of South African Customs Union	31	55	43
Democratic Republic of the Congo and Angola	-74	-4	-38

Source: GTAP v8 simulations.

The contribution to welfare of the increase in employment is shown in Table 13.9. There is no contribution under the fixed scenario, but significant contributions under the flexible and rigid scenarios. For example, one-third of Mozambique's welfare gains of USD 303 million are explained by increased employment under the rigid scenario. However, labour doesn't capture all the gains. Under the rigid scenario, total welfare increases USD 147 million over the fixed scenario, but the contribution of labour accounts for just USD 109 million of this. Holding down real wages benefits consumers and owners of other factors such as capital and land.

The changes in wages for unskilled and skilled labour are shown in Table 13.10. The greater the degree of liberalisation undertaken, the greater the wage increases. For most countries, these changes are positive, although Malawi is an exception. In the fixed scenario, wages of skilled and unskilled tend to move together. This does not happen under the flexible employment scenario because there is no change in wages for unskilled workers by assumption.

Table 13.9. Endowment effects: the contribution of increase in employment to welfare

	Fixed	Flexible	Rigid
	USD m	USD m	USD m
Botswana	0	21	10
Madagascar	0	1	0
Mozambique	0	217	109
Mauritius	0	5	3
Malawi	0	7	3
Tanzania	0	10	5
Zambia	0	49	24
Zimbabwe	0	289	146
South Africa	0	155	77
Rest of South African Customs Union	0	21	11
Democratic Republic of the Congo and Angola	0	44	22

Source: GTAP v8 simulations.

Table 13.10. Real wages for skilled and unskilled labour

	Unskilled			Skilled		
	Fixed	Flexible	Rigid	Fixed	Flexible	Rigid
Botswana	0.1	0.0	0.0	0.0	0.3	0.1
Madagascar	0.0	0.0	0.0	0.0	0.1	0.1
Mozambique	5.4	0.0	2.6	6.6	9.9	8.3
Mauritius	0.1	0.0	0.1	0.1	0.2	0.1
Malawi	0.3	0.0	0.2	-0.8	-0.6	-0.7
Tanzania	0.1	0.0	0.1	0.2	0.3	0.3
Zambia	0.8	0.0	0.4	1.2	1.5	1.4
Zimbabwe	18.0	0.0	8.0	24.2	30.6	27.6
South Africa	0.1	0.0	0.1	0.2	0.2	0.2
Rest of South African Customs Union	0.3	0.0	0.2	0.3	0.4	0.4
Democratic Republic of the Congo and Angola	0.1	0.0	0.1	0.2	0.3	0.3

Source: GTAP v8 simulations.

Labour use by sector

Perhaps of greater interest is employment by sector in each country. This is shown for unskilled and skilled labour for the rigid scenario in Annex Tables 13.A1.2 and 13.A1.9. The most striking estimate concerns manufacturing employment in Mozambique, which rises six fold. This comes from a very low base. Manufacturing accounts for less than 1% of output in Mozambique and the value of labour employed in the sector amounts to only USD 14 million. It appears that the manufacturing sector relocates from Malawi and Zimbabwe, where employment in the sector falls by a quarter and a half respectively. Zimbabwe has high tariffs (164%) in this sector, especially on imports from Mozambique, across the border. The tariff of most significance appears to be HS630900, "Worn clothing and other worn textile articles traded in bulk or in bales, sacks or similar bulk packings".

The apparel sector sees significant gains in Mozambique and Malawi while Tanzania increases employment in textiles. Apparel is generally considered to be more labour intensive and less skilled than textile production, although it is further down the supply chain. However, the input-output data do not show this for SADC countries. The electronics industry is one where employment is likely to increase in Malawi, Botswana and Zimbabwe.

Table 13.11. Change in employment of unskilled labour under the rigid scenario

Botswana	0.28
Madagascar	0.01
Mozambique	4.30
Mauritius	0.10
Malawi	0.28
Tanzania	0.09
Zambia	0.63
Zimbabwe	..
South Africa	0.13
Rest of South African Customs Union	0.25
DRC & Angola	0.13

Source: GTAP v8 simulations.

Also of interest is the employment of unskilled labour in agriculture, as it is this group that includes many of the rural poor. In Mozambique, there are declines in rural employment as these workers move out of sugar production and migrate to the manufacturing sector. In other countries there is not much movement in primary agriculture except perhaps in the "Other crops" sector in Malawi and South Africa. There are increases in employment in processed agriculture in Zimbabwe and South Africa. There are similar percentage changes in skilled labour but these don't amount to much in absolute terms because the initial level of skilled labour in agriculture is low.

Because percentage changes can be deceptive, absolute changes in unskilled employment, by value, are shown in annex table 13.A1.10. The greatest changes are in Mozambique manufacturing and Zimbabwe metals manufacture. There are also large changes in the services sector where jobs diminish elsewhere in the economy.

The results are not sensitive to values of the elasticity of substitution between primary factors. For example, doubling the sugar elasticity in Table 13.6 from 0.72 to 1.44 increases the change in the use of unskilled labour in the sugar sector in Malawi from 15.29% to 15.65%. Nor are the results sensitive to the elasticity of substitution between intermediate inputs. Increasing this from 0 to 1 for sugar, leads to a change in employment of 14.71. Welfare increases only marginally.

Regional trade liberalisation usually leads to trade creation among member states and trade diversion regarding trade with non-members. An increase in exports to members and rising output lead to positive employment effects. Due to the changes in relative prices and the corresponding trade diversion effect and the impact on tariff revenue, the effect on welfare is, however, not necessarily positive in all countries.

13.5. Implications and conclusions

The African Union is pursuing an integration agenda. To facilitate convergence towards achievement of a continental common market the AU recognised eight regional economic communities as building blocs, SADC being one of them. SADC countries share the common objective of regional integration. Compared with other regional economic communities in Africa, the share of intra-SADC trade is relatively high at 11% of the total trade for the region but could be increased with continued economic integration. This note analysed the impact on trade flows and employment of further regional trade liberalisation in SADC. A general equilibrium model has been used to assess the likely employment and trade effects.

The CGE results suggest that where high tariffs are removed, substantial changes in production and employment in a specific sector may occur. These changes bring benefits, but will inevitably result in temporary dislocation and some adjustment costs. No attempt has been made here to measure the costs of adjustment, but it is worth noting that the tariff changes are generally phased in over a number of years, and that during that time the economy might grow significantly. The employment effects from the elimination of intra-SADC tariffs are positive but small in all SADC member countries. The welfare effect, taking into account the costs of production and reduction of tariff revenues, is positive for SADC as a group but varies for individual countries depending on the labour market assumption.

The alternative closures emphasise the importance of using all available resources. Unemployed resources impose a significant opportunity cost on the economy. Governments can play a role by implementing labour market policies that enhance mobility between sectors and ease the burden of temporary unemployment. This policy mix can include education, training, infrastructure, and providing information about where new jobs are likely to be. Social security systems could mitigate the costs for individuals to adjust. This analysis goes some way towards indicating where the demand for skills is likely to be following tariff reductions.

Furthermore, it has been shown that intra-SADC trade is in more sophisticated products than SADC's external trade. Regional integration could thus have a positive impact on structural change. Other arguments for regionalism such as development of larger markets that could attract foreign direct investment and foster greater competition have not been analysed or discussed in detail in this note. Also, a possible positive impact on the productivity of firms cannot be captured by a standard CGE model.

The approach used here has further limitations. Apart from the usual concerns about data quality, the analysis is dependent on input-output tables that can become out of date in a growing economy. Parameter values that are applied globally in the model may not be specific to individual countries. Furthermore, no account is taken here of whether employees in one occupation, such as agriculture, could be productive in another specific occupation, such as apparel. Some jobs may not lend themselves to mobility.

Despite these limitations the analysis identifies some important aspects of regional trade in SADC. Trade liberalisation in SADC is likely to lead to more employment and to have a positive impact on structural change. The effects of the tripartite free trade agreement need to be analysed separately. However, SADC and the tripartite FTA are important building blocs for Africa's continent-wide economic integration.

References

Hausmann R., J. Hwang and D. Rodrik (2007), "What you Export Matters", *Journal of Economic Growth*, 12 (1): 1-25.

Hertel, T. and M. Tsigas (1997), "Structure of GTAP", Chapter 2 in *Global Trade Analysis: Modeling and Applications*, T.W. Hertel, (ed.), Cambridge University Press.

Hidalgo C., B. Klinger, A-L. Barabasi and R. Hausmann (2007), "The Product Space Conditions the Development of Nations", *Science Magazine*, 317 (5837): 482-487.

Hoekman, B. M. and L.A. Winters (2007), "Trade and Employment: Stylized Facts and Research Findings", in *Policy Matters: Economic and Social Policies to Sustain Equitable Development*, (eds.) J.A. Ocampo, J. Kwame Sundaram and S. Khan.

ILO (2010), "Trade and Employment", Chapter 3 in *Prospects for Labour Market Recovery: Policies for Employment and Development*, Yaoundé.

Klinger, B. (2009), "Is South-South Trade a Testing Ground for Structural Transformation?", *Policy Issues in International Trade and Commodities Study Series*, No. 40, UNCTAD.

Kwelke, J. and P. Mboya (2005), "Regional Integration and Poverty: The Case of Tanzania", in *Regional Integration and Poverty*, D. te Velde (ed.), Overseas Development Institute, London.

McMillan, M. and D. Rodrik (2011), "Globalization, Structural Change and Productivity Growth", in *Making Globalization Socially Sustainable*, Bacchetta, M. and M. Jansen (eds.), ILO and WTO.

McMillan, M. and I. Verduzco (2011), "New Evidence on Trade and Employment: An Overview", in Jansen, M. R. Peters and J. Salazar-Xirinachs (eds.), *Trade and Employment: From Myths to Facts*, ILO-EC publication.

OECD (2006), *South–South Trade: Vital for Development*, Policy Brief, OECD, August.

UNCTAD (2009), *Economic Development in Africa Report 2009: Strengthening Regional Economic Integration for Africa's Development*, United Nations, Geneva.

UNCTAD (2011), "Assessing the Evolution of the International Trading System and Enhancing its Contribution to Development and Economic Recovery", TD/B/C.I/15, United Nations, Geneva.

UNCTAD and African Union (2012), "Trade Liberalization, Investment and Economic Integration in African Regional Economic Communities: Towards the African Common Market", United Nations, Geneva.

von Uexkull, E. (2012, in this volume), "Regional Trade and Employment in ECOWAS", OECD.

Annex 13.A1

Table 13.A1.1. SADC countries' exports by destination and product group, average 2007-10

Country	Product group	Total exports	SADC	Other SSA	EU	Other HiOECD	BRIC	RoW
		%	%	%	%	%	%	%
Botswana	Raw materials	65.6	2.6	0.0	59.1	0.5	2.1	1.2
	Int. goods	22.6	8.9	0.0	1.3	9.1	0.8	2.5
	Cons. goods	8.6	6.5	0.0	1.4	0.5	0.0	0.1
	Capital goods	2.8	2.6	0.0	0.1	0.0	0.0	0.0
	Total	100.0	20.9	0.1	62.0	10.2	2.9	3.9
Madagascar	Raw materials	17.3	0.3	0.1	11.6	1.5	2.9	1.0
	Int. goods	8.2	0.7	0.4	2.9	0.2	1.3	2.8
	Cons. goods	65.6	2.0	0.5	41.9	15.3	0.6	5.3
	Capital goods	7.0	0.9	0.4	1.5	1.4	0.8	2.0
	Total	100.0	4.0	2.4	58.3	18.4	5.5	11.3
Malawi	Raw materials	72.4	10.7	0.3	32.2	10.3	4.9	13.9
	Int. goods	12.8	5.6	0.8	4.2	0.5	1.2	0.4
	Cons. goods	12.9	6.8	0.7	2.8	1.8	0.2	0.6
	Capital goods	1.9	1.6	0.0	0.1	0.1	0.1	0.0
	Total	100.0	24.7	2.0	39.3	12.7	6.4	15.0
Mauritius	Raw materials	6.2	0.3	0.1	2.3	1.3	0.5	1.7
	Int. goods	22.7	3.7	0.5	15.7	1.9	0.2	0.7
	Cons. goods	60.4	6.1	0.8	44.6	7.0	0.2	1.7
	Capital goods	4.7	0.7	0.2	1.5	-0.1	0.2	2.1
	Total	100.0	10.9	1.6	64.1	10.1	1.1	12.2
Mozambique	Raw materials	16.7	3.0	0.0	5.9	1.0	3.1	3.7
	Int. goods	59.6	11.9	0.2	28.3	0.1	1.7	17.3
	Cons. goods	7.0	5.4	0.1	0.5	0.1	0.0	0.9
	Capital goods	4.3	2.1	0.1	0.5	0.3	0.0	1.2
	Total	100.0	22.6	0.5	45.3	1.5	4.8	25.2
Namibia	Raw materials	50.2	10.3	0.0	26.6	9.6	3.1	0.5
	Int. goods	21.2	4.4	0.1	8.2	4.3	1.2	3.1
	Cons. goods	23.0	22.4	0.1	0.2	0.1	0.0	0.2
	Capital goods	5.1	3.4	0.0	1.1	0.1	0.0	0.4
	Total	100.0	40.9	0.3	36.2	14.2	4.3	4.2
Seychelles	Raw materials	0.6	0.1	0.0	0.2	0.0	0.0	0.4
	Int. goods	15.0	0.1	0.1	12.4	1.4	0.1	0.9
	Cons. goods	27.9	0.4	0.0	27.0	0.1	0.0	0.3
	Capital goods	1.5	0.2	0.0	1.0	0.1	0.0	0.1
	Total	100.0	0.9	0.1	40.9	1.8	0.1	56.1

Table 13.A1.1. SADC countries' exports by destination and product group, average 2007–10 (continued)

Country	Product group	Total exports	SADC	Other SSA	EU	Other HiOECD	BRIC	RoW
		%	%	%	%	%	%	%
South Africa	Raw materials	28.0	1.0	0.4	9.8	3.8	8.3	4.6
	Int. goods	41.3	3.4	1.6	9.8	17.2	4.0	5.2
	Cons. goods	15.8	4.0	1.1	3.3	5.1	0.2	2.2
	Capital goods	15.0	3.6	1.2	6.5	1.6	0.5	1.6
	Total	100.0	12.0	4.3	29.5	27.7	12.9	13.6
Swaziland	Raw materials	5.7	5.6	0.0	0.0	0.0	0.0	0.0
	Int. goods	76.9	62.5	0.0	13.8	0.1	0.0	0.0
	Cons. goods	13.5	12.9	0.0	0.1	0.4	0.0	0.0
	Capital goods	3.9	3.8	0.0	0.0	0.0	0.0	0.0
	Total	100.0	85.0	0.0	13.9	0.5	0.0	0.6
Tanzania	Raw materials	39.8	0.7	1.4	10.8	8.4	14.1	4.3
	Int. goods	40.6	11.4	4.6	2.3	16.7	3.1	2.6
	Cons. goods	14.3	3.7	6.5	1.8	0.9	0.2	1.1
	Capital goods	3.9	0.9	1.6	0.7	0.2	0.1	0.4
	Total	100.0	16.8	14.2	15.9	26.3	17.6	9.2
Zambia	Raw materials	14.2	6.3	0.1	1.6	4.9	1.1	0.2
	Int. goods	76.4	9.0	0.7	2.4	43.2	10.2	10.8
	Cons. goods	7.3	3.6	0.1	0.7	1.8	0.8	0.4
	Capital goods	1.6	1.4	0.0	0.1	0.1	0.0	0.0
	Total	100.0	20.4	0.9	5.2	50.0	12.1	11.4
Zimbabwe	Raw materials	33.3	11.6	0.2	7.5	0.5	3.9	6.4
	Int. goods	33.3	27.2	0.3	1.9	2.7	0.4	0.3
	Cons. goods	33.3	21.8	0.7	6.2	1.9	0.3	0.3
	Capital goods	0.0	4.6	0.0	0.5	0.4	0.1	0.3
	Total	100.0	65.2	1.3	16.1	5.5	4.7	7.4
SADC	Raw materials	29.4	2.0	0.3	12.2	3.8	7.0	4.1
	Int. goods	41.0	5.4	1.4	8.9	16.3	3.8	5.2
	Cons. goods	17.0	5.2	1.0	4.5	4.3	0.2	1.8
	Capital goods	11.9	3.2	1.0	4.9	1.2	0.4	1.3
	Total	100.0	15.8	3.8	30.7	25.6	11.4	12.7

Source: UN Comtrade, average 2007-10.

Table 13.A1.2. Mozambique tariffs on imports from SADC members, by sector

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%	%
Rice	0	0	0	0	7.5	0	0	0	3.77	0	0
Other crops	0	0	0	0	0.48	0	5.1	0.54	6	9.93	0
Vegetables	0	0	0	0	17.99	18.27	0	20	18.98	11.27	0
Sugar	0	0	0	0	7.5	6.12	0	7.5	7.5	0	0
Plant based fibres	0	0	0	0	0	0	0	0	0	0	0
Livestock	0	0	0	0	10.11	19.8	9.72	6.65	10.33	3.43	0
Fishing	0	0	0	0	0	0	0	0	4.54	0	0
Resources	0	0	0	5.47	0.91	1.96	1.4	0.22	1.04	0	0
Meat	19.4	0	0	0	0	0	0	19.99	18.18	19.91	0
Other processed agriculture	0	0	0	8.55	9.56	17.49	18.64	18.11	16.38	18.06	0
Textiles	19.98	4.45	0	20	8.11	19.35	7.43	11.51	14.13	7.21	14.39
Wearing apparel	20	12.65	0	20	20	20	0	20	19.95	20	0
Chemicals	2.55	11.43	0	16.97	14.9	11.79	18.5	4.85	6.97	6.41	0
Metal manufactures	0	10.68	0	7.88	9.63	10.2	6.77	0.01	5.35	7.3	0
Wood & paper products	0	9.46	0	8.08	2.36	12.99	0	6.69	9.25	9.68	0
Manufactures	8.61	3.13	0	6.23	6.22	4.98	2.61	8.68	6.22	10.18	7.46
Electronics	13.32	11.56	0	11.56	8.87	11.06	0	12.94	8.6	10.33	11.56

Source: GTAP V8.

Table 13.A1.3. Tanzania tariffs on imports from SADC members, by sector

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Zambia	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%
Rice	0	0	0	7.5	0	0	0	3.77	0	0
Other crops	0	0	0	0.48	0	5.1	0.54	6	9.93	0
Vegetables	0	0	0	17.99	18.27	0	20	18.98	11.27	0
Sugar	0	0	0	7.5	6.12	0	7.5	7.5	0	0
Plant based fibres	0	0	0	0	0	0	0	0	0	0
Livestock	0	0	0	10.11	19.8	9.72	6.65	10.33	3.43	0
Fishing	0	0	0	0	0	0	0	4.54	0	0
Resources	3.76	0	5.47	0.91	1.96	1.4	0.22	1.04	0	0
Meat	0	0	0	0	0	0	19.99	18.18	19.91	0
Other processed agriculture	0	0	8.55	9.56	17.49	18.64	18.11	16.38	18.06	0
Textiles	0	0	20	8.11	19.35	7.43	11.51	14.13	7.21	14.39
Wearing apparel	0	21.98	20	20	20	0	20	19.95	20	0
Chemicals	0.79	0	16.97	14.9	11.79	18.5	4.85	6.97	6.41	0
Metal manufactures	3.55	1.56	7.88	9.63	10.2	6.77	0.01	5.35	7.3	0
Wood & paper products	0	4.42	8.08	2.36	12.99	0	6.69	9.25	9.68	0
Manufactures	1.37	4.59	6.23	6.22	4.98	2.61	8.68	6.22	10.18	7.46
Electronics	0	0	11.56	8.87	11.06	0	12.94	8.6	10.33	11.56

Source: GTAP V8.

Table 13.A1.4. Zambia tariffs on imports from SADC members, by sector

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%
Rice	0	0	0	0	0	0	0	0	0	0
Other crops	0	0	3.63	0	0	1.18	0	8.56	0	0
Vegetables	5.25	0	0	0	0	5	0	5.73	0	0
Sugar	0	0	0	0	0	5	0	5	5	0
Plant based fibres	0	0	5	0	0	0	0	0	0	0
Livestock	0	0	0	0	0	3.66	3.29	1.91	0	0
Fishing	0	0	0	0	0	0	0	2.11	0	0
Resources	0.01	0	2.85	0	0	0.01	1.15	2.69	0	0
Meat	0	0	0	0	0	0	0	5.84	0	0
Other processed agriculture	4.94	0	3.58	0	0	13.73	37	18.34	5.66	0
Textiles	6.07	0	1.91	0	0	20.83	12.85	14.19	13.67	0
Wearing apparel	12.73	0	5	0	0	25	25	23.2	19.02	0
Chemicals	1.9	0	1.43	0	0	4.86	0.92	2.39	4.65	0.1
Metal manufactures	3.1	0	0.09	0	0	4.58	3.81	1.86	4.82	4.19
Wood & paper products	3.52	0	1.83	0	0	11.86	1.87	7.22	3.2	4.98
Manufactures	5.42	0	2.18	0	0	2.17	1.89	3.24	3.03	0.89
Electronics	5	0	5	0	0	2.56	0	2.03	2.24	5

Source: GTAP V8.

Table 13.A1.5. Zimbabwe tariffs on imports from SADC members, by sector

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%
Rice	12.49	0	15	0	0	0	0	12.36	10	0
Other crops	4.84	0	5.62	0	0	50	0	11.94	0	0
Vegetables	17.14	0	22.88	0	0	0	0	24.92	0	0
Sugar	0	0	24.97	0	0	0	0	20.04	0	0
Plant based fibres	0	0	2.5	0	0	0	0	2.5	0	0
Livestock	5	0	28.48	0	0	0	0	9.79	16.82	0
Fishing	0	0	17.96	0	0	0	0	13.88	6.52	0
Resources	5.57	0	9.19	0	0	5.02	0	23.82	7.5	0
Meat	8.38	0	40	0	0	35	0	22.56	32.83	0
Other processed agriculture	33.29	0	18.89	0	0	24	0	27.89	10.36	0
Textiles	89.82	0	18.5	0	0	36	0	24.14	35.63	24.92
Wearing apparel	55	0	60	0	0	58	0	57	40	58
Chemicals	6.19	0	3.14	0	0	17.13	0	9.84	12.76	8.36
Metal manufactures	5.02	0	12.78	0	0	15.02	0	15.91	20.09	21.27
Wood & paper products	8.18	0	23.77	0	0	19.18	0	23.11	11.46	21.44
Manufactures	27	0	163.99	0	0	11	0	16.29	19.57	30.93
Electronics	19	0	16	0	0	12	0	13.16	13	5

Source: GTAP V8.

Table 13.A1.6. DRC and Angola tariffs on imports from SADC members, by sector

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zimbabwe	South Africa	Rest of SACU
	%	%	%	%	%	%	%	%	%	%
Rice	0	0	0	0	10	0	0	0	6.7	4.15
Other crops	0	0	2.93	0	6.95	0	2	8.22	5.47	4.7
Vegetables	0	0	12.27	0	15.33	0	0	15.33	12.51	13.95
Sugar	0	0	14.29	0	20	16.88	0	0	4.96	2.67
Plant based fibres	0	0	2	0	0	0	0	0	2	0
Livestock	0	0	0	0	0	0	6.74	4.61	6.17	5.09
Fishing	0	0	0	0	0	0	0	0	19.39	19.58
Resources	1.55	14.97	0.57	0	0	0	0	5.14	17.98	23.36
Meat	13.57	0	0	0	0	0	0	9.4	10.43	12.83
Other processed agriculture	6.55	0	15.75	0	10	17.12	19.3	18.78	22.38	22.01
Textiles	20	0	6.2	6.93	14.27	12.86	0	18.83	8.13	13.47
Wearing apparel	20	0	14.88	19.64	0	19.65	0	15.58	14.34	14.11
Chemicals	11.18	0	8.75	7.3	8.97	15.47	9.71	15.75	9.03	11.99
Metal manufactures	8.74	0	4.2	10.85	14.34	2.51	4.14	8.48	11.02	6.88
Wood & paper products	14.87	0	7.33	13.36	17.91	9.01	14.54	19.64	13.51	15.05
Manufactures	3.54	6.3	6.05	4.04	7.39	5.07	1.18	10.15	3.17	7.29
Electronics	5.3	0	8.38	11.91	5	10.54	4.86	5	3.97	7.76

Source: GTAP V8.

Table 13.A1.7. Labour output ratios for SADC members, by industry

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
Rice	20	29	43	0	31	30	18	0	6	15	0
Other crops	18	66	54	39	32	46	45	12	14	27	50
Vegetables	25	62	49	52	49	50	51	11	16	30	55
Sugar	0	31	14	23	16	13	21	6	7	16	25
Plant based fibres	0	57	40	0	48	26	42	11	7	25	58
Livestock	24	31	49	32	37	47	29	11	10	18	46
Fishing	0	16	23	13	47	45	5	0	10	7	8
Resources	8	16	63	10	28	64	19	11	10	14	12
Meat	23	18	4	27	10	29	13	1	4	23	22
Other processed agriculture	19	18	15	19	11	10	17	13	10	21	20
Textiles	38	14	14	21	9	9	9	19	14	21	24
Wearing apparel	41	15	21	26	14	6	12	8	18	27	28
Chemicals	23	14	20	49	10	3	34	0	7	51	44
Metal manufactures	80	12	10	13	29	4	2	11	12	14	11
Wood & paper products	26	14	17	29	13	15	22	39	15	29	30
Manufactures	23	14	16	17	21	4	11	15	9	20	16
Electronics	11	0	0	18	11	4	22	17	9	19	16
Transport & communications	26	20	13	19	29	23	31	23	16	22	20
Business services	35	49	27	34	51	24	33	25	24	34	32
Services and activities NES	33	18	27	45	37	20	24	30	31	46	45
Total	30	23	27	29	31	25	22	18	19	29	31

Source: GTAPv8 database. Various years. Rest of SACU includes Namibia, Lesotho and Swaziland.

Table 13.A1.8. Change in unskilled labour use for SADC members, by industry, rigid scenario

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%	%
Rice	0	0	-7	0	3	0	0	1	4	0	3
Other crops	0	0	-2	0	5	0	0	1	1	1	0
Vegetables	0	0	-2	0	0	0	-1	5	0	1	0
Sugar	0	-1	-13	0	15	0	3	3	0	-2	0
Plant based fibres	-1	0	-11	0	4	4	-1	0	-1	-3	0
Livestock	0	0	-2	0	1	0	0	5	0	0	0
Fishing	-0.04	-0.04	1.74	0	-1.68	0.04	-1.23	18.47	0.07	1.6	-0.06
Resources	-0.58	0.07	-6.35	0.01	3.27	-0.05	0.47	-0.92	0.02	-1.34	0.51
Meat	-0.17	-0.01	-6.12	-0.05	-1.27	0.17	-0.17	13.66	0.39	-0.46	0.83
Other processed agriculture	0.2	0.04	-3.69	-0.11	-1.17	-0.18	-0.36	11.18	1.11	3.6	-1.36
Textiles & apparel	38.51	0.18	-20.7	0.18	0.71	8.62	-2.46	-18.52	0.28	-1.59	0.05
Wearing apparel	-1	0	-11	0	3	1	-2	6	0	-3	0
Chemicals	0	0	-12	0	2	1	-5	4	0	0	-1
Metal manufactures	-2	0	-18	1	-6	0	4	32	-1	-3	1
Wood & paper products	0	0	-1	0	1	-1	-3	-11	1	6	-1
Manufactures	-1	0	654	0	-29	1	-4	-50	0	2	1
Electronics	30	1	5	0	4	8	-3	35	2	5	0
Transport & communications	0	0	9	0	1	0	1	26	0	0	0
Business services	0	0	7	0	-1	0	1	20	0	-1	0
Services and activities NES	0	0	5	0	-1	0	2	33	0	1	0

Table 13.A1.9. Change in skilled labour use for SADC members, by industry, rigid scenario

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zimbabwe	South Africa	Rest of SACU	DRC & Angola
	%	%	%	%	%	%	%	%	%	%	%
Rice	-0.13	0.02	-9.3	-0.46	3.18	-0.26	-0.25	-7.88	3.69	-0.29	2.61
Other crops	0.19	0.06	-3.03	0.01	5.18	-0.12	-0.5	-3.42	1.07	0.62	-0.01
Vegetables	0.08	0	-2.94	0.04	0.65	-0.02	-0.92	0.83	0.17	0.71	-0.52
Sugar	0.38	-0.68	-16.16	0.07	15.99	-0.35	1.89	-8.34	0.39	-2.5	-0.2
Plant based fibres	-0.88	-0.03	-12.64	0.4	4.39	3.49	-0.95	-3.9	-1.49	-3.25	-0.06
Livestock	-0.06	-0.05	-3.72	0.05	1.36	0.25	-0.55	0.8	0.22	-0.31	0.02
Fishing	-0.06	-0.04	0.65	-0.01	-1.52	0	-1.42	14.59	0.04	1.56	-0.09
Resources	-0.61	0.06	-7.63	-0.01	3.5	-0.1	0.22	-5.04	-0.01	-1.4	0.47
Meat	-0.29	-0.06	-11.63	-0.12	-0.33	-0.03	-1.23	-5.66	0.24	-0.7	0.62
Other processed agriculture	0.08	0	-9.34	-0.18	-0.23	-0.38	-1.43	-7.72	0.96	3.34	-1.56
Textiles & apparel	38	0	-26	0	2	8	-4	-34	0	-2	0
Wearing apparel	-1	0	-17	0	4	1	-4	-14	0	-3	0
Chemicals	0	0	-18	0	3	1	-6	-16	0	0	-1
Metal manufactures	-2	0	-23	1	-5	0	3	7	-1	-3	0
Wood & paper products	0	0	-7	0	2	-1	-4	-28	0	6	-1
Manufactures	-1	0	605	0	-28	0	-5	-60	-1	2	1
Electronics	30	1	-2	0	5	7	-5	10	1	5	0
Transport & communications	0	0	0	0	2	0	0	-3	0	-1	0
Business services	0	0	0	0	0	0	0	-2	0	-1	0
Services and activities NES	0	0	-2	0	1	0	1	6	0	0	0

Table 13.A1.10. Absolute change in unskilled labour use for SADC members, by industry, rigid scenario

	Botswana	Madagascar	Mozambique	Mauritius	Malawi	Tanzania	Zambia	Zim-babwe	South Africa	Rest of SACU	DRC & Angola
	USD m	USD m	USD m	USD m	USD m	USD m	USD m	USD m	USD m	USD m	USD m
Rice	0	0	-3	0	0	0	0	0	0	0	0
Other crops	0	0	-11	0	18	-1	-2	1	5	1	0
Vegetables	0	0	-5	0	0	0	-1	0	2	1	-7
Sugar	0	-1	-1	0	2	0	1	0	1	-1	0
Plant based fibres	0	0	-2	0	1	1	0	0	0	0	0
Livestock	0	0	-3	0	1	1	0	1	1	0	1
Fishing	0	0	1	0	0	0	0	0	0	0	0
Resources	-1	0	-19	0	2	-1	1	-1	1	-3	9
Meat	-0.2	0	-0.18	-0.01	-0.08	0.21	-0.05	0.14	1	-0.3	1.21
Other processed agriculture	0.24	0.09	-4.11	-0.14	-0.44	-0.54	-0.92	10.22	28.06	11.57	-9.62
Textiles & apparel	26.26	0.14	-1.35	0.31	0.03	1.37	-0.64	-8.14	2.83	-1.72	0.11
Wearing apparel	-0.57	0.13	-0.86	0.38	0.24	0.26	-0.63	0.2	5.14	-3.66	-0.33
Chemicals	-0.01	0.03	-2.13	0.67	0.59	0.16	-1.51	0.02	10.03	-0.72	-7.11
Metal manufactures	-15.07	0	-26.48	0.27	-1.58	0.09	2.4	50.03	-58.85	-5.87	2.17
Wood & paper products	0.16	0.07	-0.13	-0.03	0.13	-0.54	-2.84	-6.29	13.83	6.45	-2.85
Manufactures	-0.84	0.02	138.04	0.05	-14.47	0.14	-3.52	-42.73	-20.33	4.15	6.43
Electronics	0.44	0	0.02	-0.04	0.03	0.05	-0.49	0.57	3.71	0.89	0.2
Transport & communications	-0.37	0.15	11.56	0.17	0.58	0.86	7.45	23.96	-2.06	-0.89	4.68
Business services	0.16	0.27	12.09	0.21	-0.92	0.68	5.6	14.69	24.79	-2.85	9.43
Services and activities NES	1.96	0.13	48.04	0.46	-2.9	3.86	23.43	143.52	80.77	6.51	20.34