

How integrated is SADC? Trends in intra-regional and extra-regional trade flows and policy*

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Abstract:

Do SADC countries trade enough with each other and with the rest of the world? While its share of world trade has fallen, appropriate benchmarking shows that, controlling for GDP and other characteristics, SADC countries have experienced an increase in openness that is comparable to other developing countries. Once market size and geography are taken into account, trade between SADC countries is actually high. SADC countries also trade more products with each other than they do with the rest of the world. In this sense, and contrary to stylized fears, the SADC region is quite integrated. While SADC has reduced its tariffs, the structure remains complex and could be lowered on intermediates. Other impediments make it costly and difficult to move goods, but are at levels which are comparable with countries at similar levels of development. While this may be surprising, there is still scope for improvement and SADC's disadvantageous geography makes it important for other trade impediments to be reduced.

1) INTRODUCTION

International trade is viewed as one of the key factors underlying the success of the fastest growing economies yet many countries remain isolated and have failed to achieve this integration. To what extent are the SADC countries afflicted? To answer this question, this paper looks at recent trends in intra-regional trade flows and in the region's trade with the rest of the world. Its analytic objective is to identify the extent to which SADC economies have integrated into the global trading system as well as the regional market. In addition, the paper addresses some of the main institutional and policy barriers to trade in the region.

The extent of market integration is evaluated using trade flow data. SADC's aggregate trade performance since 1990 is benchmarked against international counterparts. One aim of this analysis is to identify whether SADC is being marginalised in world trade. The results in section 2 show that SADC has continued to experience a decline in its share of world trade over the past decade and a half. However, the decline also reflects relatively poor economic growth and not necessarily structural impediments to trade. Benchmarked against GDP, SADC has experienced an increase in openness over the past decade that is comparable to other developing countries. Similarly, regressions indicate increased exports by SADC members over time even controlling for GDP growth. This change is equal in magnitude for SADC exporters as other countries. SADC has therefore become more integrated with the world economy over the past decade and a half and the extent of this increase in integration is equivalent to other comparable countries.

In section 3, the paper then looks at intra-SADC trade. Intra-regional trade rose as a share of total trade during the 1990s, but progress in this regard has slowed recently. The level of and trends in intra-regional trade, however, are not even across countries. South Africa has become an important source of imports for SADC countries with the

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ending of sanctions in the early 1990s, yet imports by South Africa from the SADC region remain small. Regression results suggest that, *ceteris paribus*, SADC countries trade with each other more than they do elsewhere. The coefficients indicate they trade with each other more than twice as much as other pairs do. Trade is in this sense regionalized in SADC.

We continue with an analysis of product market integration in section 4. High levels of concentration are found; the top 10 products at the 6-digit HS level account for upwards of 70% of intra-SADC trade flows for each country. Most of these products are resource-based, which reflects the comparative advantage of the region. Such high levels of concentration are not unique to intra-SADC trade. In fact, exports to non-SADC members appear to be even more concentrated.

Additional measures that compare the proportion of possible goods traded yield similar outcomes. Most SADC countries actually export more products to the region than the rest of the world. The product composition of exports to the rest of SADC also differs from the product composition of exports to the rest of the world. To the extent that product market integration leads to a greater dispersion or diversification of trade, these trends would be indicative of relatively high levels of market integration within the region.

The findings are consistent with work for sub-Saharan Africa. They imply that SADC's trade performance is not sub-par, but this does not mean SADC is trading enough. What then is the scope for further increases in trade?

Tariffs on imports are a key policy instrument available to government to influence product market integration. In section 5, we show SADC members have made significant progress in reducing barriers to trade. Trade barriers between members have largely been eliminated under the SADC Free Trade Agreement. MFN rates have also fallen. The SADC region now faces a trade policy environment that is more conducive towards promoting intra- and extra-regional trade flows and product market integration.

Nevertheless, scope remains for further MFN reform, particularly of tariffs on intermediate inputs. The structure of tariffs also varies substantially across SADC countries, remains complex in many countries and inhibits regional trade flows by necessitating complex rules of origin. Further, widely varying tariff structures will inhibit negotiations on a common external tariff required under the proposed customs union.

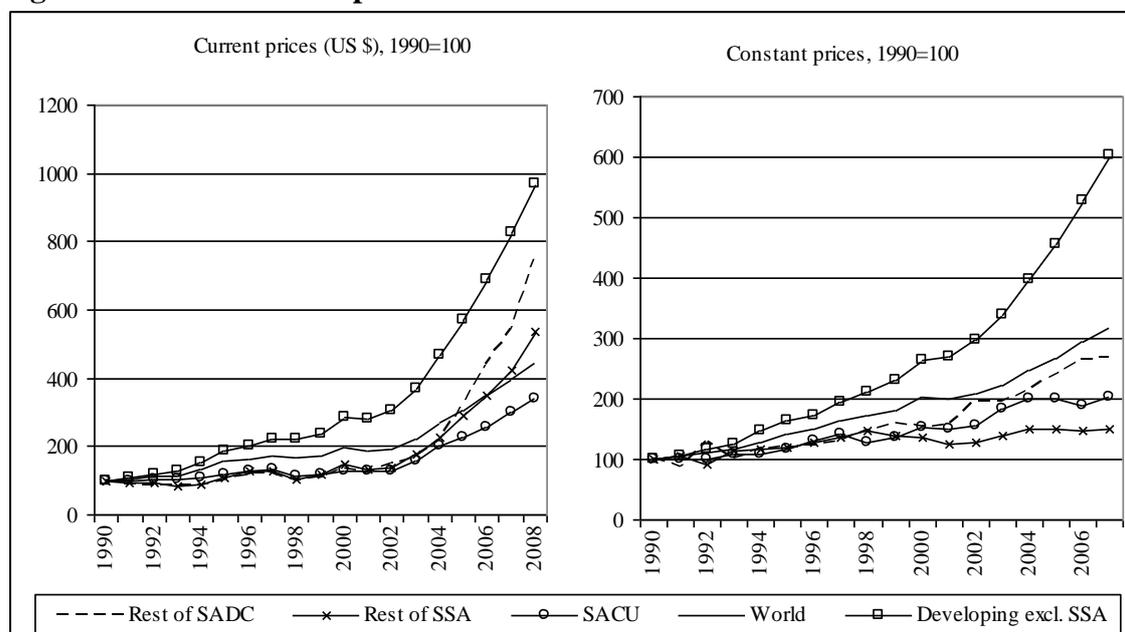
In section 6, the data indicates that trade is costly and difficult in many SADC countries. However, using a benchmarking exercise that considers SADC's geography and level of development, trade impediments are not uncharacteristically high. Section 7 briefly concludes.

2) IS SADC BEING MARGINALISED IN WORLD TRADE?

Sub-Saharan Africa's (SSA) share of world trade declined dramatically in the second half of the 20th century (Amjadi and Yeats 1995; Amjadi, Reincke and Yeats 1996; Ng and Yeats 1996). This section analyses the persistence of these trends in recent years focussing in particular on SADC countries.

Figure 1 compares the value (US\$) and volume of merchandise exports by SADC with the rest of Sub-Saharan Africa, the 'world' and developing countries excluding SSA. Growth in exports from SACU and the rest of SADC was mediocre during the 1990s relative to the rest of the world and other developing countries, but rose strongly from 2002. Growth in the dollar value of exports was particularly strong and can be attributed to improved terms of trade associated with the commodity price boom. Export performance evaluated in terms of volumes is more mediocre after 2002, particularly for the rest of SSA where oil-rich Nigeria dominates.

Figure 1: Merchandise exports

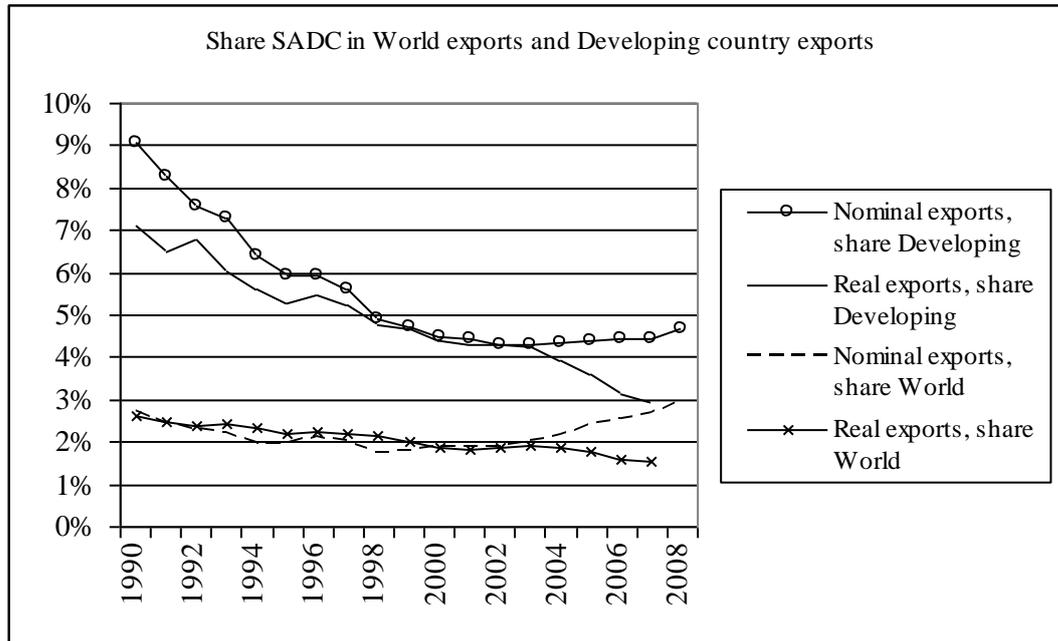


Source: Own calculations using World Development Indicators. Export volumes were converted to values using 2000 prices. The sample consists of 99 countries, 37 of which are from SSA (15 from SADC), 41 from other low and middle-income countries and 21 from high-income countries. Volume data for Namibia are not available, but the country is included in the figure based on current prices. Only countries for which data are available in each year are included in the sample to avoid changes in trade values arising from changes in the country composition.

As a consequence, while the SADC share of world trade in current US dollars in 2008 (1.6 percent) was marginally higher than its share in 1990 (1.5 percent), in real terms its share declined from 1.3 percent to 0.95 percent over this period (see Figure 2).¹ The apparent marginalisation of SADC in world exports is more drastic when compared with other developing countries. The share of SADC in developing country real exports fell from 7.1 to 2.9 percent.

¹ There is substantial heterogeneity in export performance across countries within the SADC area. Real export growth since 1990 exceeded the world average for five of fourteen countries while Mozambique and Lesotho exceeded the rest of the developing world.

Figure 2: SADC merchandise exports as a share of world exports and developing country exports, nominal and real values

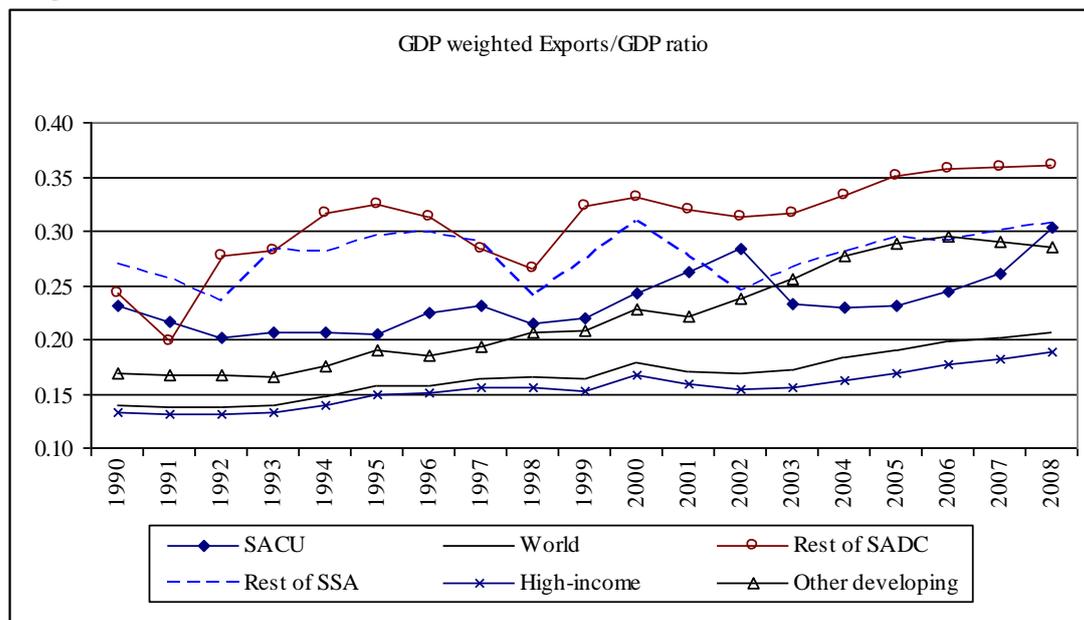


Source: Own calculations using data from World Bank World Development Indicators. See earlier figure for further details. The sample consists of 99 countries, 37 of which are from SSA (15 from SADC), 41 from other low and middle-income countries and 21 from high-income countries. Volume data for Namibia are not available, but the country is included in the figure based on current prices. Only countries for which data are available in each year are included in the sample to avoid changes in trade values arising from changes in the country composition.

However, trade values alone misrepresent the extent to which an economy under or over trades as they do not take into levels of GDP (Rodrik, 1997). Figure 3 therefore plots trends in the ratio of exports to GDP for various regions. There is substantial variation across SADC countries, but the data indicate that SADC is relatively open to trade compared to its international counterparts.² For example, in 2008, the world ratio of exports was about 20% while those for SACU and the rest of SADC were above 30%. The data also indicate that most SADC countries have become more open during the 1990s.

² A similar observation is reached when using exports plus imports to GDP as the measure of openness.

Figure 3: Merchandise exports as a share of Gross Domestic Product, 2000 GDP weighted



Notes: Own calculations using World Bank Development Indicators. Region aggregates are constructed using 2000 GDP values as weights. Zimbabwe is excluded.

Gravity model based estimates, which control for geographical and other observed and unobserved country characteristics, corroborate these findings (see Appendix 1 for a brief description of the gravity model specifications and the full results in Table 9). Exports from the average country in the sample were 18.5 log points in higher in the 2001-2005 period than the 1991-1995 period, controlling for GDP growth (and unobserved time invariant characteristics) (column 1). The trend is no different for SADC countries, as revealed by the insignificant coefficients on the SADC-period interactions terms.

In addition, SADC countries are found to be no more or less prone to trade relative to the rest of the world, controlling for GDP, distance and a number of other geographical features (see the coefficients on the SADC exporter and importer dummies in column 2).

3) HOW INTEGRATED IS TRADE IN THE SADC REGION?

Table 1 and Table 2 present the share of SADC trade in regional exports and imports from 1980 to 2003. African trade data are notoriously problematic with different datasets providing different values of trade flows (Yeats 1990). Concerns about data quality are particularly relevant for intra-African trade flows. Nonetheless, various insights emerge from the data.

Intra-SADC trade grew significantly from 1980, but has halted in recent years. For example, the share of SADC exports destined for the region more than tripled to 9.9 percent from 1990 to 1995, but then rose very gradually to 12.1 percent in 2008 (based on sample excluding Angola, DRC, Madagascar and Seychelles for which earlier data are not available) (Table 2). These trends are corroborated by the gravity model estimates (column 1 of Table 9 in Appendix 1) which imply no significant change in intra-SADC trade over the 1991 to 2005 period (see the insignificant coefficient on the intra-SADC dummy variable).

Dependence on the region for trade divides countries into two groups. Malawi, Mozambique, Zambia, and Zimbabwe depend heavily upon SADC, particularly for imports. These countries source upwards of 50 percent of their imports from other SADC countries and sell more than 20 percent of their exports to the region. The remaining countries in SADC maintain much stronger trade relationships with the rest of the world (ROW). For example, intra-regional trade makes up approximately 10 percent of Mauritian exports and imports. SACU sources only 5.6 percent of its imports from the region. SADC accounts for a much higher percentage (10.5) of SACU exports, which leads to large trade imbalances between SACU and the rest of SADC.

Substantial asymmetries in trade flows persist. SACU trade, which is predominantly made up of South African trade flows, dominates intraregional trade flows. Between 60 to 70 percent of SADC exports to the region are sold to SACU (Table 1), while 80 to 90 percent of SADC (excluding SACU countries) imports from the region are purchased from SACU (Table 2). The region is therefore more dependent on South Africa as a source of imports than as a market for exports.

Table 1 Share of SADC trade in SADC country imports

	1980	1985	1990	1995	1999	2003	2008	Proportion from SACU 2003	Proportion from SACU 2008
Angola	0	0.6	0.8	7.1	10		6.5		99.9
DRC	0.4	1.6	1.1	18.1	31.5		42.8		3.3
Malawi	36.7	53	24.8	49.2	64.4	57.5	58.3	65	46.4
Mauritius	14.5	4.2	9.9	11.3	11.2	13.2	9.9	97	84.8
Mozambique	3.7	5	7.6	55.5	58.6	39.5	38.0	97	94.7
SACU	0.1	1.8	1.8	2.1	1.9	2.7	5.6		0.0
Tanzania	0.7	0.7	1.3	13.9	13.3	15	11.5	66	90.4
Zambia	1.2	10.9	7.9	49.1	65.5	65	59.1	95	74.1
Zimbabwe	8.3	31.7	33.1	51.2	51.2	56.1	76.1	94	91.8
Seychelles							10.7		55.6
Madagascar							9.3		72.1
Intra-SADC	1.6	4.7	5.1	9.9	10.2		12.3	90	80.3 ^a
excl. Angola, DRC, Madagascar and Seychelles						10.6	12.3		78.8

Source: Development Network Africa (2007) and Chauvin, S. and G. Gaulier (2002) updated to 2008 using HS6-digit data obtained from UNComtrade. Note: Intra-SACU trade is excluded. 2002 values used for Zimbabwe in 2003.

a. 80.3 percent of SADC (excluding SACU countries) imports from the region are sourced from SACU.

Table 2: Share of SADC trade in SADC country exports

	1980	1985	1990	1995	1999	2003	2008	Proportion to SACU 2003	Proportion to SACU 2008
Angola	0.03	0	0.01	0.03	0.7		1.8		99.9
DRC	0.05	0.03	0.1	6	0.3		6.7		3.3
Malawi	12.4	15.4	1.6	17.2	16.9	20.1	21.8	74	50.4
Mauritius	1.4	0.1	1.2	1.4	1.4	2.1	11.3	76	32.8
Mozambique	1.1	0.3	0.2	32.1	17.41	24.6	17.2	74	65.4
SACU	0.7	2.8	2.5	10.7	11.5	9.7	10.5		
Tanzania	5.2	0.1	0.5	1.4	7.4	9.4	17.2	45	55.7
Zambia	0.9	3.1	0.8	3.8	7.8	40.6	20.0	50	54.1
Zimbabwe	1.3	25	30.7	31.7	28	30.5	64.4	79	81.2
Seychelles							1.2		
Madagascar							3.1		
Intra-SADC	0.9	3.4	3.1	9.9	10		6.1	68	72.8 ^a
excl. Angola, DRC, Madagascar and Seychelles						10.6	12.1		62.9

Source: Source: Updated table from Development Network Africa (2007) and Chauvin, S. and G. Gaulier (2002). Note: Intra-SACU trade is excluded. 2002 values used for Zimbabwe in 2003.

a. 72.8 percent of SADC (excluding SACU countries) exports to the region are sold to SACU.

Further insights on the regionalization of SADC trade are provided by the gravity model. These estimates (Column 3 of Table 9 in Appendix 1) reveal that SADC trade is regionalized: intra-SADC trade is relatively high in relation to what intra-regional incomes and distance would predict. For example, the coefficient on the intra-SADC dummy is significant and at 0.976 suggests that SADC countries trade more than double what would be implied by the gravity model benchmark. Additional specifications indicated that these results are robust to the exclusion of South Africa. The results are consistent with those of earlier research for SSA by Foroutan and Pritchett (1993).³

³ See also Subramanian and Tamirisa (2003) and Yang and Gupta (2008).

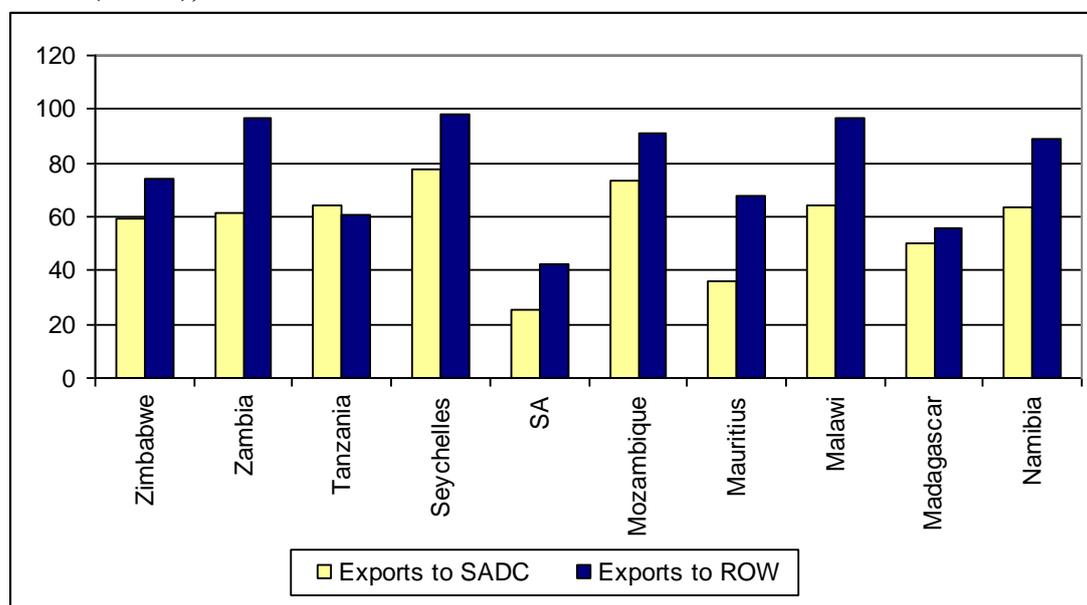
4) HOW DIVERSIFIED IS SADC TRADE?

High barriers between countries reduce not only the volume of a particular product being exported to a particular destination, but also the number of different products being exported there (Melitz, 2003). Therefore, we would expect greater integration to manifest itself in the form of larger varieties of products being traded. To enhance our understanding of SADC integration, this section now assesses the diversity of products being traded; it first reveals the share of exports accounted for by the top 10 export products before presenting measures of the ‘thickness’ of trade.

Figure 4 presents the share of total exports to SADC and the Rest of the World (ROW) made up by the top 10 export products by value to each region in 2008. What is striking is the high level of export concentration. The top 10 export products account for over 60 percent of exports for SADC members outside of SACU. In some cases (Malawi, Mozambique, Zimbabwe) the top 10 products account for over 90 percent of export volumes.

The concentration of SADC exports, however, is higher with the Rest of World than with SADC members. In most cases the export concentration ratio is 15 percentage points or more greater for exports to the rest of the world than it is for exports to other SADC members. This is consistent with the aggregate analysis of intra-SADC trade and corroborates the finding that SADC trade is regionalized.

Figure 4: Share of top 10 export products in total exports to SADC and Rest of world (ROW), 2008



Notes: Own calculations using HS 6-digit 2008 data obtained from UNComtrade.

Looking at the actual products exported in Table 3, the top 10 products to the Rest of World and SADC are comprised mainly of primary products, although Mauritius and Malawi are also exporters of clothing and textile products.⁴ A further observation is

⁴ Not shown in this table is the relatively high level of apparel exports from Swaziland and Lesotho associated with preferences under the African Growth and Opportunity Act (Portugal-Perez 2008;

that the product compositions of trade flows to the region and to the rest of the world differ. There is some overlap, but products that make up a high proportion of exports to the SADC area often make up only a small proportion of the country's exports to the rest of the world.

Export market "Thickness"

An alternative quantity-based measure of market integration is a modification of the market "thickness" indicator (I_j) developed by Knetter and Slaughter (2001), which measures the share of all possible products that a country actually exports.⁵ Lower trade barriers between countries are expected to increase the range of products traded.⁶

Table 4 presents the total number of products and proportion of all possible HS 6-digit products (in parentheses) exported by each SADC country to the region and to the rest of the world in 2008. The final column present the simple average number of products exported to each SADC member (excluding Botswana, Lesotho, Swaziland and Namibia). Madagascar, for example, exports on average 89 products (2 percent of the 5222 HS6-digit product lines) to each SADC member. However, because the same products are not exported to each SADC countries, the total number of distinct product lines exported by Madagascar to the SADC region is substantially higher at 725 (14 percent of all possible products).⁷ The table offers the following insights:

SADC countries export a relatively high proportion of all possible 6-digit products, despite the concentration levels shown earlier. Almost all the SADC countries export over 30 percent of all 6-digit products, with SA exporting a high 89 percent of possible products. Most of these make up very small values for SADC countries and some of the products exported are probably re-exports.

There is substantial heterogeneity in the product composition of each SADC country's exports across destinations. In other words, SADC countries export different products to different countries. The average number of distinct products exported by SADC countries to other members is low relative to the total number of products exported by the country to the region. It is only South Africa that exports a relatively high proportion (52 percent) of 6 digit products to all other SADC members.

Frazer and van Biesebroek 2010). Note also the data quality issues, as is revealed by the export of Helicopters, which make up 9 percent of Madagascar's exports to the region, in 2008.

⁵ Let z_{ijk} be a categorical variable that is equal to one if country j has some positive value of exports to country k in product i . With N possible products and $K-1$ destinations (excluding country j) in the sample, the maximum number of bilateral exports by country j equals $N \times (K-1)$. The thickness measure I_j is then calculated as

$$I_j = \frac{\sum_i \sum_{k \neq j} z_{ijk}}{(N \times (J - 1))}$$

⁶ The indicator provides no information about the volume of trade. Lower trade barriers that lead only to an increase in the volumes of trade between countries will leave the indicator unaffected. Similarly, lower trade barriers that result in national production becoming more specialized will result in a reduction in the 'thickness' of trade according to this measure. These caveats need to be considered when interpreting the results.

⁷ Note that the difference between the average number of products and the total number exported to the rest of SADC (e.g. 89 vs. 725 for Madagascar) is an indicator of differences in the product composition of exports to the other SADC members.

Table 3: Description and share of top 10 HS 6-digit export products by value to SADC and ROW, 2008

Top 10 exports to SADC by product																		
Madagascar	Malawi	Mauritius	Mozambique	Seychelles	SA	Tanzania	Zambia	Zimbabwe										
Petroleum oils and o	20.24	Cotton, not carded	11.39	T-shirts, singlets,	7.24	Electrical energy	53.77	Contnrs fr emprsd	25.94	Petroleum oils and o	8.79	Gold, nonmonetary,	38.15	Copper ores	22.27	Nickel mattes	13.68	
Helicopters of an u	9.13	Other knitted or cro	9.67	Men's or boys' trou	5.09	Petroleum oils and o	6.80	Animal feed prep	25.79	Corn (maize), other	3.92	Wheat or meslin flo	7.77	Copper wire, refine	11.39	Nickel ores and con	12.18	
Coniferous wood saw	3.85	Sunflower seeds, wh	8.32	Animal feed prep ex	4.94	Tobacco	4.19	Cigarettes containi	5.50	Trucks, nesoi, dies	2.71	Prec nesoi & semipr	5.33	Tobacco	6.35	Unused postage	5.80	
Shrimps and prawns,	3.54	Tobacco	7.11	Looped pile fabrics	3.41	Bran sharps & oth r	1.43	Fish, nesoi, with b	4.68	Structures and part	2.00	Gold, nonmonetary,	3.58	Electric conductors	4.81	Trucks, nesoi, dies	5.06	
Boring or sinking m	2.96	Corn (maize), other	6.11	Yarn, carded wool,	3.30	Unused postage, che	1.35	Fish fats & oils (n	4.16	Fertilers contain n	1.64	Soap in forms nesoi	1.77	Cane sugar, raw, so	4.02	Auto regulating ins	4.88	
Salt incl tbl/dentr	2.51	Black tea fermdt &	5.94	Men's or boys' shir	2.79	Cotton seeds, wheth	1.34	Flour meal & pellet	3.92	Other slag and ash,	1.41	Oth furn art exc he	1.74	Corn (maize), other	3.42	Cotton yarn>	4.30	
Peas, dried shelled	2.09	Cane sugar, raw, so	5.82	Woven cotton fabric	2.75	Bananas and plantai	1.27	Crustcns nesoi lve/	2.10	Wheat (other than d	1.38	Portland cement exc	1.74	Wheat or meslin flo	2.44	Liq dielect transf	3.69	
Men's or boys' shir	2.02	Natural rubber in p	3.81	Art for conveying o	2.63	Tobacco, partly or	1.19	Water, mineral	1.89	Electrical energy	1.28	Urea, whether or no	1.55	Refined copper cath	2.44	Men's or boys' suit	3.63	
Jerseys, pullovers,	2.02	Men's or boys' othe	3.05	Men's or boys' shir	1.96	Petroleum oils and o	1.13	Motorboats, other t	1.74	Manganese	1.13	Palm oil, refined b	1.45	Portland cement	2.42	Cut flowers/buds dr	3.36	
Parts for boring or	1.94	Plywood, veneer pan	2.69	Wov cot fab, dye pl	1.58	Shrimps and prawns	0.73	Watermelons, fresh	1.58	Bituminous coal, no	1.02	W/g blouses shirts	1.11	Plates sheets strp	2.19	Esters of acetic ac	2.54	
Trade Value (US\$ m)	51.7		191.9		234.5		421.0		2.9					367.4		1016.0		5
share of top 10	50.32		63.91		35.68		73.20		77.32					25.27		64.19		59.12
share top 10 in 2003 to SADC			65.2		61.60		70.20							19.50		75.50		68.20

Top 10 exports to ROW by product																		
Madagascar	Malawi	Mauritius	Mozambique	Seychelles	SA	Tanzania	Zambia	Zimbabwe										
Men's or boys' trou	15.6	Tobacco	60.3	T-shirts, singlets,	16.4	Unwrought aluminum	71.4	Tunas/skipjack/boni	37.9	Bituminous coal, no	6.8	Gold, nonmonetary,	22.0	Refined copper cath	51.1	Cut flowers and flo	24.6	
Shrimps and prawns,	6.7	Tobacco, partly or	22.8	Cane sugar, raw, so	15.8	Tobacco, partly or	7.9	Petroleum oils	37.0	latinum, unwrought	5.6	Precious metal ores	11.3	Plates sheets strp	23.7	Tobacco, partly or	13.3	
Women's or girls' t	6.6	Cane sugar, raw, so	5.8	Tunas/skipjack/boni	11.6	Shrimps and prawns,	2.9	Fish nesoi, salted	18.2	Ferchromium	5.2	Coffee, not roasted	6.3	Copper ores	11.4	Cotton, not carded	11.6	
Petroleum oils and o	5.0	Black tea fermdt &	3.7	Men's or boys' shir	6.3	Cotton, not carded	2.4	Parts of airplanes	1.4	Filter/purify machi	4.6	Tobacco, partly or	4.8	Cobalt and articles	7.2	Ferchromium	5.9	
Jerseys, pullovers,	4.1	Peas, dried shelled	1.4	Transmission appr i	4.3	Sesame seeds	1.5	Fish fats & oils (n	1.1	Platinum metal, sem	4.1	Fish fillets & oth	4.6	Ash and residues ne	0.7	Collectors items of	4.8	
Airplane & ot a/c,	3.8	Sweaters, pullovers	1.0	Men's or boys' trou	3.6	Titanium ores and c	1.4	Surveying instrment	0.7	Pass veh spk-ig int	4.0	Fish fillets, froze	3.8	Prec nesoi & semipr	0.7	Peas	4.1	
Women's or girls' t	3.8	Nuts nesoi, fresh o	0.6	Fish, nesoi, with b	2.9	Petroleum oils and o	1.1	Instr & appl f medi	0.5	Agglomerated iron	3.6	Cotton, not carded	2.2	Copper wire, refine	0.6	Peel, citrus or mel	3.0	
Jerseys, pullovers,	3.7	Sweaters, pullovers	0.6	Men's or boys' shir	2.6	Cashew nuts, fresh	0.7	Breathing appliance	0.4	Manganese ores	2.9	Black tea fermdt &	2.0	Cobalt ores and con	0.6	Citrus fruits, inc	2.6	
		Wooden bedroom								Rhodium,								
W/g blouses, shirts	3.4	furniture	0.2	T-shirts, singlets	2.4	Nonconiferous wood	0.7	Fish, nesoi, with b	0.3	unwrought	2.9	Peas, dried shelled	1.9	Precious metal ores	0.5	Elect appr f prtct	2.3	
Vanilla beans	3.1	Coniferous wood	0.2	Diamonds	2.0	Vessels,nesoi,for t	0.7	Flour meal & pellet	0.2	Diam ex ind unwkcd	2.4	Wheat (other than d	1.7	Vegetables mixtures	0.5	Tobacco	2.2	
Trade Value (US\$ bill)	1599.6		687.1		7		2033		241.5		64400		1769.5		4054.9		603.4	
share of top 10	55.8		96.7		68.0		90.8		97.8		42.3		60.7		96.8		74.2	
share top 10 in 2003 to ROW			90.9		69.2		92.6				44.5		83.9		86.6		93.7	

Source: Own calculations using SADC Trade Database. Data are classified at the 6-digit HS level. Tanzania data is for 2007.

Many SADC countries export a more diverse range of products to the SADC region than to the rest of the world, which is indicative of the regionalization of SADC trade. For example, Malawi exported 1008 distinct HS 6-digit products to the rest of SADC, but only 435 to the rest of the world. Mauritius, Namibia, Mozambique, South Africa, Zambia and Zimbabwe, similarly export a more diverse range of products to the rest of SADC.

Table 4: Export-thickness measures for SADC countries, 2008

Exporter	Total products to:			Average to each SADC country
	World	SADC	ROW	
Madagascar	1937 (37)	725 (14)	1821 (35)	89 (2)
Malawi	1122 (21)	1008 (19)	435 (8)	171 (3)
Mauritius	2564 (49)	2057 (39)	1831 (35)	216 (4)
Mozambique	1507 (29)	1137 (22)	952 (18)	148 (3)
Namibia	3448 (66)	3272 (63)	1703 (33)	611 (12)
Seychelles	511 (10)	182 (3)	440 (8)	19 (0)
South Africa	4667 (89)	4477 (86)	4286 (82)	2737 (52)
Tanzania	2183 (42)	1404 (27)	1672 (32)	214 (4)
Zambia	2216 (42)	2127 (41)	538 (10)	353 (7)
Zimbabwe	1768 (34)	1545 (30)	760 (15)	290 (6)
SADC combined	4823 (92)	4704 (90)	4482 (86)	2965 (57)

Notes: Own calculations using HS 6-digit level data obtained from UNcomtrade.

Values for Tanzania are for 2007. Note that the SADC region on the import side includes the SACU members, except for SA who does not declare exports to the other SACU countries. The total number of HS2002 codes in UNcomtrade is 5222. Data is for gross exports and therefore contains re-exports

To summarize, intra-SADC trade is low, but this is partly a consequence of low levels of economic development. Once we condition on income levels, SADC countries have experienced an increase in openness comparable to other developing countries. Intra-SADC trade is also found to be relatively high and diversified. Nevertheless, there are some worrying trends. Growth in intra-regional trade has slowed in recent years. Exports from the region continue to decline as a share of world trade. Therefore, in the following sections we look at the role of tariffs and other factors that impede further growth in SADC trade.

5) TARIFF BARRIERS TO TRADE

Tariffs remain a powerful instrument through which government can directly influence international trade and product market integration even though they are not necessarily the most important barrier to economic integration (Anderson and van Wincoop, 2004). Tariffs restrict imports and introduce a wedge between domestic and international prices. It is less recognized that tariffs are a tax on exports.⁸ Tariffs on intermediate inputs raise production costs and adversely affect the ability of exporters to compete internationally. Additionally, by raising the relative profitability of supplying the local market, scarce resources are drawn away from export competing sectors. Finally, lower imports and exports can cause the currency to appreciate, creating further adverse incentives to produce for the export market.

Tariff developments in SADC countries have taken two forms: Regional integration and multilateral/unilateral reform. On the regional front, SADC countries have actively participated in regional integration schemes. Internal tariff barriers were largely eliminated by the time SADC's Free Trade Agreement was launched in 2009 (<http://www.sadc.int>).⁹ The formation of the FTA is considered the first step in a much grander integration programme including a Customs Union supposedly by 2010, a Common Market (CM) by 2015, a Monetary Union (MU) by 2016 and a Single Currency by 2018 (<http://www.sadc.int>).

Yet sub Saharan Africa is characterized by a plethora of overlapping regional integration arrangements, each with their own proposed tariff schedules and rules of origin. Of SADC members, only Mozambique is not a member of another arrangement. Multiple memberships by SADC countries in existing or proposed customs unions (Tanzania in EAC, COMESA which includes all SADC members except for South Africa, Botswana and Mozambique) is inconsistent with the proposed formation of a SADC Customs Union. This dilemma of multiple memberships also extends to other areas such as infrastructure, where different harmonization options and strategies are being pursued (Kritzinger-van Niekerk and Moreira 2002).

The second type of tariff reform is multilateral or unilateral liberalization. On this front, SADC countries have made considerable progress in reducing import barriers since the early 1990s. Table 5 presents summary statistics of the 2008 MFN tariff rates applied by each SADC country. Simple average tariffs range from 2.9 percent in Mauritius to 25.5 percent for Zimbabwe.¹⁰ For most countries, average MFN rates

⁸ This is the well known Lerner Symmetry theorem. Edwards and Lawrence (2008) find that reductions in the export bias associated with tariff liberalisation accounted for approximately 40 percent of South Africa's export growth after 1994. Similarly, Edwards (2010) finds that liberalisation of tariffs on intermediate inputs is associated with improved manufacturing export performance in Africa.

⁹ South Africa, for example, reduced most tariffs on SADC imports to zero in 2000 (Edwards 2005), while other countries phased their tariffs down at a slower rate (<http://www.sadc.int/fta>).

¹⁰ The average rate for Zimbabwe appears to be particularly high even compared to earlier period. For example, the WTO World Tariff Report for 2007 estimates average protection in Zimbabwe to equal to 14 percent. The 2006 WTO World Tariff Profiles indicate a simple average of 16 percent for Zimbabwe for 2003. This highlights the difficulty in estimating average protection for countries. Many of the countries, SACU in particular, used non-ad valorem rates such as specific rates, mixed rates and compound rates. SACU also used formula duties which we find a reservation price. If import prices fell

range from 7 to 14 percent, which situates them in the range for low-income and upper-middle-income countries.

These current tariff levels in SADC countries are considerably lower than they were during the early 1990s, despite limited offers made in the Uruguay round to reduce bound rates (Wang and Winters, 1998). As shown in Table 6, the simple average MFN tariff rate applied by SADC countries fell from 18.8 percent in 1997 to 10.2 percent in 2007.¹¹ The average decline in tariffs is therefore comparable to other developing countries (Edwards, 2005). Declines in protection were particularly high in Mauritius, Seychelles, Malawi and Tanzania, but these reductions came off a high base: initial tariffs rates in these countries exceeded 20 percent in 1997. Madagascar appears to be the exception with average tariffs rising from 6.9 percent in 1995 to 12.4 percent in 2007. It is not clear from the data whether this reflects the replacement of non-ad valorem tariffs with ad-valorem rates or actual increases in tariff protection.

Also of interest are variations in the degree of liberalisation across different sectors. Table 6 shows average protection declined for all end-use categories (consumer goods, intermediate goods and capital goods) from 1997 to 2007, with relatively strong decreases in tariffs on consumer goods. This is suggestive of a decline in effective protection in SADC countries from the mid-1990s. Nevertheless, tariff escalation remains high. In 2007, the average tariff on consumer goods at 19 percent was 3.5 times the average tariff on capital goods and more than double the tariff on intermediate goods. Such escalation of the tariff schedule suggests that effective protection rates on consumer goods are substantially higher than 19 percent. It is only Mauritius that, on average, imposes tariffs of less than 10 percent on consumption goods.

Looking beyond average tariff rates, various indicators of complexity in Table 5 reveal enormous differences across the SADC members. For example, Mauritius, Zimbabwe and SACU members have over 150 tariff bands and are followed by Zambia and Seychelles with between 30 and 50. The remaining members impose less than 10 bands. The DRC, Madagascar, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe impose tariffs in excess of 15 percent on 33 to 41 percent of all tariff lines. In contrast, less than 10 percent of tariff rates exceed 15 percent in Angola and Mauritius.

below this price additional tariffs were levied (Edwards, 2005). Calculating the ad valorem equivalent of these non-ad valorem rates is sensitive to international prices.

¹¹ The simple average is presented, as the import-weighted average results in a downward bias in the average tariff rate, as numerous highly protected products are not imported. Anderson and Neary (1994) derive alternative “trade restrictiveness” indicators that better reflect the welfare costs of protection (the dead weight loss is proportional to the square of tariff rates) and use import weights adjusted for the distortionary effect of tariffs. However, even these measures of protection require positive import values. Finally, the data does not include ad valorem equivalents of the numerous non-ad valorem rates applied by these countries, particularly during the 1990s.

Table 5: Structure of MFN tariffs applied by SADC economies, 2008

		Angola	Botswana	DRC	Lesotho	Madagascar	Malawi	Mauritius	Mozambique	Namibia	Seychelles	South Africa	Swaziland	Tanzania	Zambia	Zimbabwe	SADC average
Complexity	year	2008	2008	2008	2008	2008	2008	2008	2008	2008	2007	2008	2008	2008	2008	2008	
	Number of tariff lines	5201	6671	5794	13348	6362	5397	12516	5203	6671	5122	6671	6671	5260	5984	5899	6851
	Number of bands	7	157	4	157	5	6	283	6	157	51	169	157	14	31	372	105
	Duty free lines (% total)	0	59.5	0	59.5	1.9	9.8	87.7	2.9	59.5	87.2	59.5	59.5	37.2	19.3	6.2	36.6
	Non-ad valorem (% lines)	0	2.3	0	2.6	0	0	2.8	0	2.3	0.6	2.3	2.3	0.2	2.1	6.8	1.6
Binding coverage (%)		100	96.6	100	100	29.7	31.2	17.9	13.6	96.6		96.6	96.6	13.4	16.8	21.2	59.3
Average rates	All products	7.3	7.8	12	7.8	12.5	13	2.9	10.1	7.8	8.2	7.8	7.8	12.6	13.8	25.5	10.5
	Non-agriculture	6.9	7.6	11.9	7.5	12.1	12.6	2.7	9.5	7.6	6.4	7.6	7.6	11.5	13	25.5	10
	Agriculture	10	9.4	12.8	9.4	14.7	15.5	4.2	13.8	9.4	19.7	9.3	9.4	19.9	19.3	25.4	13.48
Maximum rate		30	346	30	141	20	25	286	20	346	786	>1000	346	113	66	>1000	197
Dispersion	Domestic spikes (3*average) (% lines)	2.5	9	0	9	0	0	11.7	0	9	10.8	9	9	0.7	0.1	5.6	5.1
	International (>15%) (% lines)	10	21	35.2	21	38.3	36.9	5.5	33.5	21	10.8	21	21	40.7	33.2	35	25.6
	Coefficient of variation	92	154	51	138	50	73	333	72	154	422	206	154	95	73	215	152

Source: WTO World Tariff Profiles 2009.

Table 6: Simple average applied MFN tariff, percent

	1997	2001	2007	Change 97-07 %
Angola		8.81	7.2	-1.48 ^a
Madagascar	6.94	4.61	12.4	5.11
Malawi	25.3	13.1	13.3	-9.58
Mauritius	28.7	18.4	3.15	-19.85
Mozambique	15.7	13.8	10.3	-4.67
Seychelles		28.3	7.12	-16.51 ^a
SACU	11.3	8	7.74	-3.20
Tanzania	24.3	16.3	12.6	-9.41
Zambia	14.1	12.6	13.7	-0.35
Zimbabwe	23.8	19.6	14.1	-7.84
Pooled simple average	18.8	14.4	10.2	-7.24
Pooled import-weighted	8.42	6.95	6.45	-2.00
<i>Tariffs by End-Use</i>				
Consumption goods	31.3	26.3	19.7	-8.9
Intermediate inputs	15.2	11.0	8.7	-5.7
Capital goods	12.4	8.1	6.2	-5.5

Source: Team calculations using TRAINS data at HS 6-digit level; SACU tariffs from 1997 are obtained from Edwards (2005)

Notes:

a. Change is based on the 2001-2007 period.

*1995 tariff used in Madagascar for 1997 period

*2002 tariff used for 2001 period for Mauritius, Zambia and Angola

*2006 tariff used for 2007 for Angola and Malawi. 2008 tariff used for Zambia

The end-use classification is based on the BEC classification obtained UN Statistics.

Passenger vehicles are excluded as they are both a capital and consumption good.

The percentage change in the tariff inclusive border price is calculated as $(t_1 - t_0)/(1 + t_0)$, where t_1 and t_0 refer to tariff rates in the final and initial periods, respectively.

These rates do not include ad valorem equivalents and are therefore not directly comparable to those obtained from the WTO World Tariff Profiles 2009 and used in the prior table.

In sum, the SADC FTA has largely eliminated within SADC tariffs, but many countries remain members of multiple overlapping and sometimes inconsistent agreements on the continent. MFN tariffs fell from the mid-1990s, although the degree of liberalization varies across members and effective protection remains high on consumer goods. The structure of tariffs is also complex in some SADC countries and will inhibit product market integration, despite the formation of a free trade area.

6) OTHER TRADE IMPEDIMENTS

It is by now accepted that institutional, infrastructure and regulatory burdens present obstacles to the movement of goods across borders. Obstacles include poor infrastructure (Limão and Venables, 2001), market regulations that restrict competition in transport (Teravanithorn and Raballand, 2008) and weak micro-level institutions, including port efficiency, customs environment, regulatory environment and policies affecting cost of entry (Johnson and others, 2007; Wilson and others, 2005; Njinkeu and others 2008). These micro-level institutional effects are often greater impediments to African trade than tariff barriers (Portugal-Perez and Wilson 2009).

For example, it costs more than twice as much to clear a standard 20-foot container for exports or imports in SSA and SADC countries as in the East Asia & Pacific (Table 7). Costs are particularly high in Zimbabwe, Botswana, Zambia and Congo (DR). The time taken to export and import is also high in SSA and SADC countries compared to other regions: more than three times that of the OECD and twice that of Latin America & Caribbean (Table 7).

Table 7: Time delays and trade costs

Region or Economy	Documents to export (number)	Time to export (days)	Cost to export (US\$ per container)	Documents to import (number)	Time to import (days)	Cost to import (US\$ per container)
East Asia & Pacific	6.7	23.1	909.3	7.1	24.3	952.8
Eastern Europe & Central Asia	6.5	26.8	1581.8	7.8	28.4	1773.5
Latin America & Caribbean	6.8	18.6	1243.6	7.3	20.9	1481
Middle East & North Africa	6.4	22.5	1034.8	7.4	25.9	1221.7
OECD	4.3	10.5	1089.7	4.9	11	1145.9
South Asia	8.5	32.4	1364.1	9	32.2	1509.1
Sub-Saharan Africa	7.8	33.6	1941.8	8.8	39.4	2365.4
SADC	7.4	35.1	1903.7	8.8	42.4	2348.3
Angola	11	65	2250	8	59	3240
Botswana	6	30	2810	9	41	3264
Congo, Dem. Rep.	8	44	2607	9	63	2483
Lesotho	6	44	1549	8	49	1715
Madagascar	4	21	1279	9	26	1660
Malawi	11	41	1713	10	51	2570
Mauritius	5	14	737	6	14	689
Mozambique	7	23	1100	10	30	1475
Namibia	11	29	1686	9	24	1813
South Africa	8	30	1531	9	35	1807
Swaziland	9	21	2184	11	33	2249
Tanzania	5	24	1262	7	31	1475
Zambia	6	53	2664	9	64	3335
Zimbabwe	7	53	3280	9	73	5101

Source: World Bank Doing Business Survey.

<http://www.doingbusiness.org/ExploreTopics/TradingAcrossBorders/> [Accessed 10 June 2010]

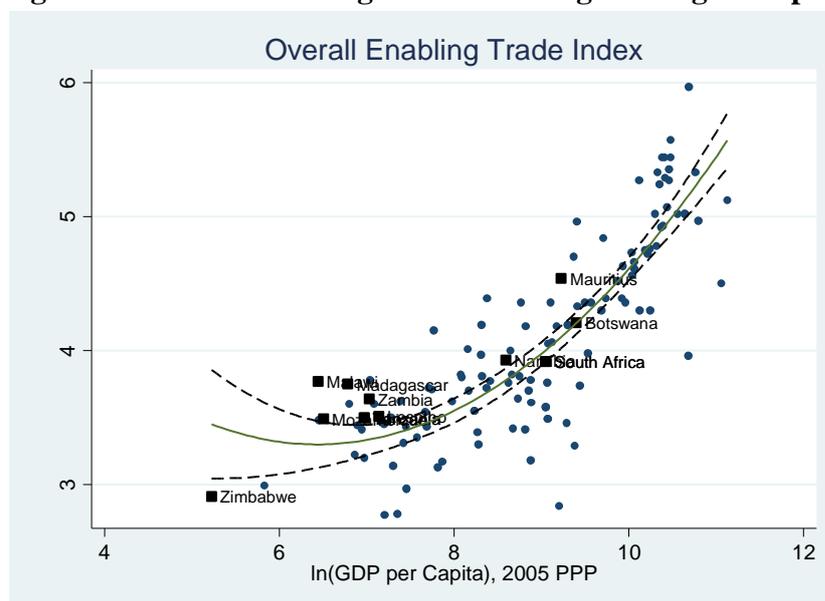
Yet simple unconditional cross-country comparisons such as these do not take into account the interdependent relationship between geography and trade costs. African countries are often far from developed markets and many countries are landlocked, all of which raise internal and external transport costs (Behar and Venables,

forthcoming).¹² Rather than indicating policymakers are doing a bad job, it could show that nature makes their job harder than elsewhere.

Furthermore, various composite indicators of the trade environment are closely correlated with the level of development. This is most clearly reflected in Figure 5 which plots the 2009 World Economic Forum Enabling Trade Index (ETI) against log GDP per capita – a proxy for development. The fitted (quadratic) line is also included. Similar plots based on logistics quality and time delays are presented in Appendix 2.

Analogous to our benchmarking of trade flows earlier in this paper, we benchmark SADC’s trade environment against other countries with a similar level of development. For example, Figure 5 reveals high ETI values in many SADC countries relative to their GDP per capita. This suggest that these countries are not unusually constrained by their environment relative to their peers.

Figure 5: Overall Enabling Trade Index against log GDP per capita



Source: Team calculations using the World Economic Forum Enabling Trade Indices (ETI) obtained from the WEF Global Enabling Trade Report (2009) and GDP data from the World Bank World Development indicators. Notes: ETI indicators range from 1 (worst outcome) to 7 (best outcome). Values for Botswana are obtained from the 2010 edition

Table 8 presents the results of a benchmarking exercise to identify the relative performance of SADC in terms of its institutional and other obstacles to trade. Composite indicators of the trade environment are regressed on GDP per capita and its square as well as population, area and a dummy for whether the country is landlocked.¹³ A dummy for the SADC region is included to estimate the extent to

¹² The gravity model estimates presented in column 4 of Table 9 in the appendix reveal that SADC countries are disproportionately disadvantaged by their distance from markets.

¹³ Note that this equation does not account for the endogeneity of trade-related institutional environment and level of development, although lagged GDP levels (2005 values) are used in the regression. High trade costs, for example, may contribute towards low levels of development. The equation is therefore not to be interpreted as a causal relationship. Rather, it is used a simple benchmarking exercise.

which institutional and other obstacles to trade in this region deviate from expected values based on income, population and geography.

The composite indicators are drawn from the World Economic Forum (WEF) Enabling Trade Index (ETI), the World Bank Logistics Performance Index (LPI) and an index constructed from the World Bank Trading on Time variables presented in Table 7.¹⁴ Higher values reflect fewer obstacles to international trade.

Table 8: Determinants of Trade Cost indicators

		ln (GDP/Capita)	Ln (GDP/Capita) ²	Ln(area)	ln(population)	Landlocked	SADC dummy	N	R ²
Trading on Time index	Overall index	-0.168	0.028	-0.265***	0.117***	-0.918***	-0.085	187	0.605
	Import index	0.032	0.017	-0.245***	0.103**	-0.990***	-0.149	187	0.603
	Export index	-0.368	0.039*	-0.286***	0.131***	-0.847***	-0.022	187	0.573
World Economic Forum Enabling Trade Indices)	Overall index	-1.144**	0.093***	-0.115**	0.039	-0.071	0.214**	135	0.757
	Market access	0.514	-0.028	-0.037	-0.082	0.157	0.540**	135	0.131
	Border administration	-1.476**	0.123***	-0.204**	0.118**	-0.319**	0.224**	135	0.745
	Efficiency of customs administration	-1.061	0.103**	-0.250**	0.188**	0.350*	0.365**	135	0.595
	Efficiency of import-export procedures	-0.358	0.049	-0.369***	0.199***	-1.112***	-0.034	135	0.67
	Transparency of border administration	-3.013***	0.219***	0.007	-0.033	-0.196	0.340***	135	0.768
	Transport & communications infrastructure	-1.695***	0.139***	-0.132**	0.146***	0.017	-0.099	135	0.855
	Availability and quality of transport infrastructure	-0.789*	0.082**	-0.024	0.069	0.014	0.152	135	0.687
	Availability and quality of transport services	-1.543**	0.121***	-0.227**	0.266***	0.146	-0.195	135	0.725
	Availability and use of ICTs	-2.736***	0.214***	-0.150**	0.107*	-0.106	-0.252*	135	0.879
	Business environment	-1.910**	0.135***	-0.089	-0.027	-0.135	0.186	135	0.599
	World Bank Logistics Performance Index	LPI Score	-1.192***	0.089***	-0.104***	0.150***	0.006	-0.017	161
Customs		-1.819***	0.126***	-0.103**	0.123***	0.004	0.04	161	0.751
Infrastructure		-1.707***	0.126***	-0.101**	0.178***	0.002	-0.045	161	0.828
International Shipments and Logistics quality and competence		-0.627**	0.049***	-0.137***	0.137***	0.054	0.067	161	0.567
Tracking and tracing		-1.237***	0.094***	-0.103**	0.172***	-0.025	0.023	161	0.773
Timeliness		-1.278***	0.095***	-0.125**	0.176***	0.002	-0.005	161	0.722
		-0.663**	0.056***	-0.051	0.123***	-0.009	-0.196**	161	0.657

Notes: Estimates are robust to heteroskedasticity. The WEF based dependent variables range from 1 (worst outcome) to 7 (best outcome). PPP GDP per capita (2005 prices) and population are obtained from World Development Indicators. Internal distances are obtained from CEPII. The World Bank Doing Business (Trading on Time) indices are constructed as follows: The underlying variables (export and import costs, time and documents) are first standardized (mean 1 and variance 1). The simple average of these is then converted to a 1 to 7 scale (1 corresponds to worst outcome, 7 to best outcome). The underlying trading times, documents and costs are the most recent values available from the World Bank Doing Business Indicators (accessed 1 June 2010). The World Economic Forum Enabling Trade Indices are obtained from the WEF Global Enabling Trade Report (2009). Values for Botswana are obtained from the 2010 edition. Area measured using internal distance of country, which is calculated as $d_{ii} = 0.67\sqrt{area/\pi}$ (see Head and Mayer (2002)). * p<.1; ** p<.05; *** p<.001

In Table 8, the explanatory variables are in columns and each row presents a regression for a different measure of trade costs. The simple regression fits the data reasonably well with 60 to over 80 percent of the variation in the composite indicators

¹⁴ The ETI and LPI are indicators of the various institutional, infrastructural and regulatory or policy constraints to the free flow of goods over borders. The WEF Enabling Trade Index, for example, is an index of barriers to trade related to market access, border administration, transport and communications infrastructure, and the business environment. The Logistics Performance Index is a summary of various areas of the logistics environment relating to customs clearance, trade and transport-related infrastructure, logistics services, etc. See WEF Global Enabling Trade Report (2009) and Arvis and others (2010) for further details on each index.

explained by the variables. In general, obstacles to trade are higher in countries that are landlocked, poor, vast and unpopulated.

The SADC dummies indicate that SADC countries do not face unusually severe obstacles to trade (conditional on geography, population and income) relative to the rest of the world. The obstacles to trade are high, but these reflect particular geographical constraints and correspond closely with their level of development. In fact, the results based on the ETI reveal that the overall trading environment and market access and border administration in particular (but not transport and communications infrastructure) are on average better in the SADC region than the rest of the world, conditional on GDP, population and geography. SADC performs poorly in terms of the timeliness with which its shipments reach the consignee.

Regressions including individual country dummies reveal relatively high obstacles associated with logistics in Angola, Botswana, Namibia, Mauritius and Zambia (see Table 10 and Table 11 in Appendix 2). Further, the SACU members, Angola, Zambia and Malawi perform poorly relative to their peers in terms of the required documents, time and cost of exporting and importing. In contrast, Madagascar, Mauritius, Mozambique and Tanzania perform well relative to their income levels.

This benchmarking analysis suggests that trade is not particularly constrained in SADC compared to other countries at similar levels of development, although there is variation at the country level. This does not imply that further investments in reducing obstacles to trade will not enhance trade flows from SADC countries. However, investments in these areas will also require an analysis of the comparative costs and (trade) benefits relative to improvements in other institutions rather than those specific to the trade environment. The results are likely to vary by country, which motivates country-level analysis that ideally uses firm level data.

Furthermore, trade-related reforms require consideration of the complementarities between the various policy constraints. Building multilane highways will not raise trade if trucks must wait at the border. Port improvements would have limited impact if the problem is getting goods to the coast. For example, Freund and Rocha (2010) highlight the importance of getting goods through transit countries in Africa while Behar, Manners and Nelson (2009) find that your neighbor's logistics quality positively influences your own exports. Regional policy co-ordination on reducing obstacles to trade is particularly important for SADC countries, many of which are landlocked.

7) CONCLUSION

This paper has identified the extent to which SADC economies have integrated into the global trading system, focusing on trade policy reform and intra-regional and extra-regional trade flows. The evidence points towards an increase in integration for SADC countries since the early 1990s. MFN tariffs have been reduced, intra-regional trade flows have increased and trade has risen as a share of GDP. Gravity model estimates confirm the finding of increased integration, as measured by trade to GDP ratios. Further, SADC trade is found to be regionalized; intra-regional trade flows are high relative to predictions. Finally, while obstacles to trade are high in SADC countries, these levels are consistent with their low income levels and adverse geography.

The implications are that SADCs trade performance is not particularly bad and its trade policy is not necessarily deficient. This leads one to question whether trade-specific reforms should be a priority. However, many regions continue to implement further reforms so SADC must keep pace. Furthermore, it can be argued that SADC needs to trade *more* than normal, which requires a trade environment that *exceeds* benchmarks and doesn't just keep pace with them. Given its unfortunate geography, it is especially important for additional technological and institutional impediments to be minimized.

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Appendix 1: Gravity model estimates

Table 9 presents various estimates based on the gravity model of Behar & Mannes (2010). To evaluate the change in intra- and extra-regional trade flows of SADC countries over time, the gravity model is embedded in a panel setting where the time periods are specified as 1991-95, 1996-2000 and 2001-05. Each period reflects the average of (strictly positive) annual values and reflects a value of zero if no annual flows are recorded that period. With this data, we can include dummies for the time period to depict evolution over time. We can also include dummies to indicate whether the exporter, importer or both are SADC countries. The results here are based on IMF DOTS export data. However, the specification is also estimated using data from UNComtrade (using a combination of measures reported by the exporter and importer). While there are major discrepancies in trade flows between the databases, the econometric results are generally consistent for both sets of data.

The equation is estimated using OLS and zero values are ignored. Alternative gravity model estimates based on a cross-country database for 2007 & 08 and estimated using a Poisson Pseudo Maximum Likelihood (PPML) estimator proposed by Santos Silva and Tenreyro (2006) corroborate our findings regarding the regionalization of SADC trade.

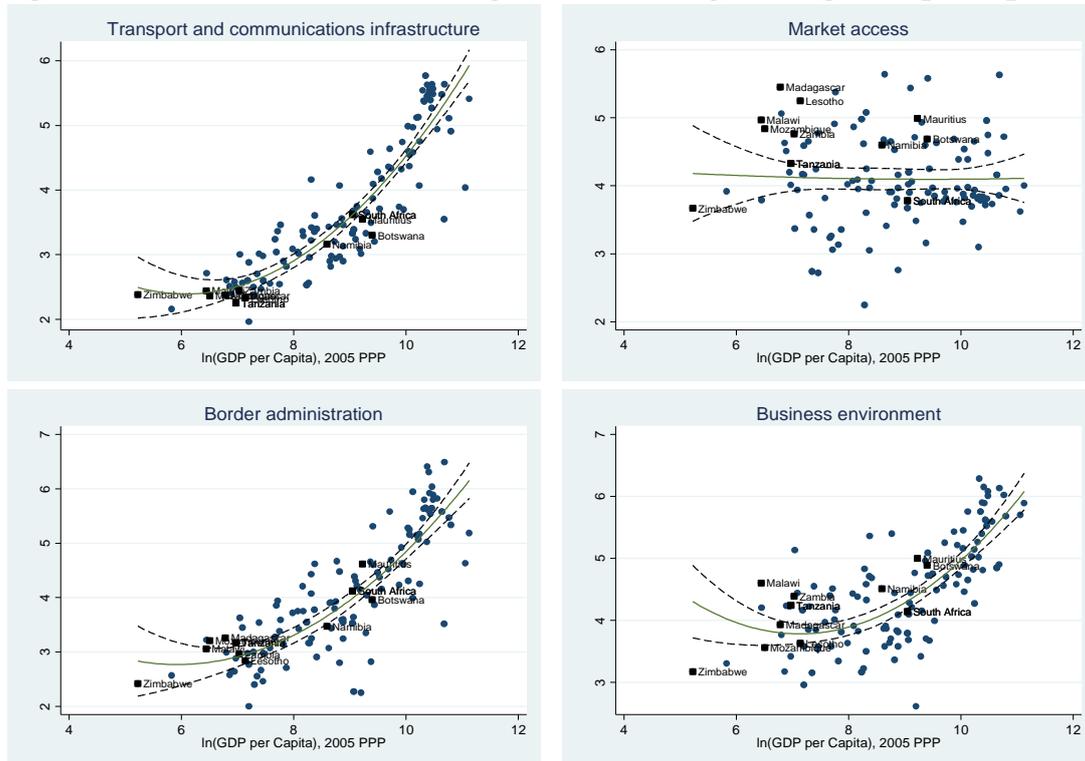
Table 9: Standard gravity estimates

Dependent variable: ln exports	(1)	(2)	(3)	(4)
ln GDP exporter	0.777***	1.233***	0.773***	0.774***
ln GDP importer	0.951***	0.915***	0.920***	0.917***
ln distance		-1.480***	-1.774***	-1.771***
(SADC exporter) x (ln distance)				-0.433***
1996-2000 dummy	0.127***	-0.0708***	0.0312	0.0318
2001-2005 dummy	0.185***	-0.199***	-0.00213	-0.00157
Share a border		1.068***	0.729***	0.739***
Formerly same country		1.258***	1.192***	1.177***
SADC exporter		0.124		
SADC importer		-0.0896		
SADC pair		1.236***	0.976***	
SADC pair * 1996-2000	0.0126			
SADC pair * 2001-2005	-0.0017			
Constant	-27.28***	-24.38***	-13.11***	-9.235**
Observations	53929	53929	53929	53929
Fixed effects?	Pair	None	Importer, exporter	Importer, exporter

Notes: * p<0.05 ** p <0.01 *** p<0.001

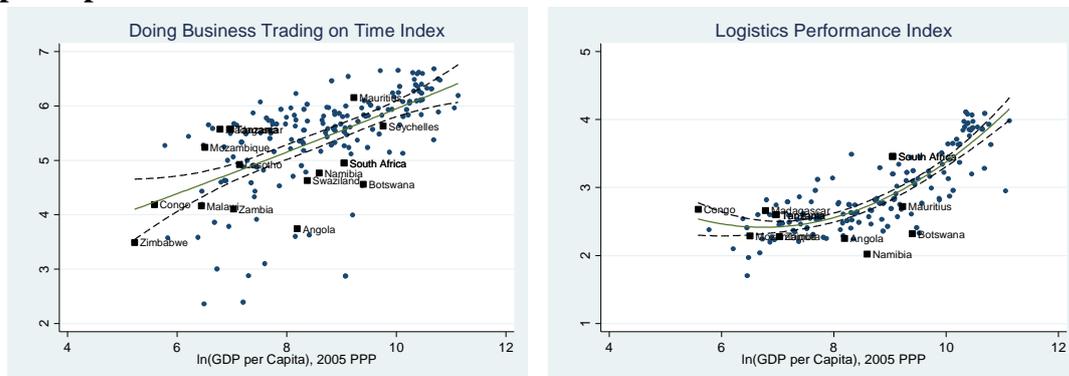
Appendix 2: Obstacles to SADC trade

Figure 6: Sub-indicators of Enabling Trade Index against log GDP per capita



Source: World Economic Forum

Figure 7: Trading on Time and Logistics Performance Indices against log GDP per capita



Note: The World Bank Doing Business (Trading on Time) indices are constructed as follows: The underlying variables (export and import costs, time and documents) are first standardized (mean 1 and variance 1). The simple average of these is then converted to a 1 to 7 scale (1 corresponds to worst outcome, 7 to best outcome). The underlying trading times, documents and costs are the most recent values available from the World Bank Doing Business Indicators (accessed 1 June 2010) and the Logistic Performance Index (2009).

Table 10: Conditional estimates of trade and infrastructure constraints to trade in SADC countries

	World Bank Doing Business indicators (Trading on Time data) (1 corresponds to worst outcome, 7 to best outcome)			World Economic Forum Enabling Trade Indices (1 corresponds to worst outcome, 7 to best outcome)				
	WB Trading on Time index	WB Trading on Time index, imports	WB Trading on Time index, exports	WEF Enabling trade index	Market access	Border administration	Transport & communications infrastructure	Business environment
ln(GDP/Capita)	-0.073	-0.004	-0.143	-1.336**	0.631	-1.607**	-1.706**	-2.651***
ln(GDP/Capita)^2	0.023	0.019	0.027	0.103***	-0.034	0.131**	0.140***	0.176***
ln(internal distance)	-0.250***	-0.228***	-0.271***	-0.109**	-0.026	-0.199**	-0.139**	-0.076
ln(population)	0.110**	0.098**	0.122***	0.039	-0.079	0.116**	0.151***	-0.031
Landlocked	-0.952***	-1.018***	-0.886***	-0.079	0.179	-0.327**	0.02	-0.179
Angola	-1.477***	-1.185***	-1.769***					
Botswana	0.043	-0.209	0.295	0.220**	0.279	0.313	-0.270**	0.555***
Congo D.R	-0.458*	-0.512	-0.404					
Lesotho	0.719***	0.659***	0.779***	0.202**	0.980***	0.144	-0.089	-0.224
Madagascar	0.634***	0.213*	1.055***	0.477***	1.627***	0.355**	-0.069	0.007
Malawi	0.084	0.196	-0.028	0.510***	0.992***	0.394**	-0.043	0.678**
Mauritius	0.079	0.075	0.083	0.278**	0.655**	0.267*	-0.18	0.365**
Mozambique	0.386**	0.152	0.621***	0.239*	1.086***	0.353**	-0.041	-0.433*
Namibia	-0.398**	-0.071	-0.725***	0.299**	0.401*	0.119	0.271**	0.428**
Seychelles	-0.531***	-0.394***	-0.668***					
South Africa	-0.666***	-0.710***	-0.622***	-0.036	-0.183*	0.123	-0.065	-0.039
Swaziland	0.069	0.029	0.109					
Tanzania	0.557***	0.371***	0.743***	0.206**	0.544***	0.184*	-0.317***	0.402**
Zambia	0.135	-0.126	0.396**	0.453***	0.689***	0.405***	0.015	0.696***
Zimbabwe	-0.191	-0.594	0.213	-0.439	-0.008	-0.215	-0.098	-1.436**
N	187	187	187	135	135	135	135	135
R ²	0.642	0.627	0.633	0.767	0.188	0.747	0.857	0.635
DSADC	-0.085	-0.149	-0.022	0.214**	0.540**	0.224**	-0.099	0.186

Notes: See notes to earlier tables for data sources and construction of variables. * p<.1; ** p<.05; *** p<.001

Table 11: Conditional estimates of Logistics Performance in SADC countries

	World Bank Logistics Performance Index (1 corresponds to worst outcome, 5 to best outcome)						
	LPI Score	Customs	Infrastructure	International Shipments	Logistics quality and competence	Tracking and tracing	Timeliness
ln(GDP/Capita) PPP	-1.133***	-1.801***	-1.674***	-0.537*	-1.084**	-1.414***	-0.491
ln(GDP/Capita)^2	0.086***	0.125***	0.124***	0.045**	0.085***	0.103***	0.046**
ln(internal distance)	-0.095**	-0.086**	-0.094**	-0.117**	-0.102**	-0.122**	-0.047
ln(population)	0.138***	0.108***	0.167***	0.122***	0.161***	0.168***	0.112***
Landlocked	0.022	0.012	0.018	0.095	-0.003	-0.002	-0.002
Angola	-0.326***	-0.473***	-0.562***	-0.230***	-0.441***	-0.052	-0.243***
Botswana	-0.461***	-0.430***	-0.458***	-0.872***	-0.347***	-0.152*	-0.423***
Congo D.R	0.084	0.078	-0.077	0.04	0.526**	-0.33	0.206
Lesotho							
Madagascar	0.253***	0.198***	0.589***	0.587***	0.159**	0.039	-0.091
Malawi							
Mauritius	-0.175***	0.094	-0.333***	0.319***	-0.350***	-0.368***	-0.532***
Mozambique	-0.124*	-0.244***	-0.022	0.311***	-0.039	-0.213*	-0.567***
Namibia	-0.406***	-0.456***	-0.371***	-0.263***	-0.238**	-0.348***	-0.761***
Seychelles							
South Africa	0.445***	0.574***	0.597***	0.321***	0.633***	0.656***	-0.064
Swaziland							
Tanzania	0.097**	0.217***	-0.157**	0.223***	0.019	-0.015	0.234***
Zambia	-0.093**	0.077	-0.158**	-0.114	-0.171**	-0.037	-0.124
Zimbabwe							
N	161	161	161	161	161	161	161
R ²	0.825	0.774	0.848	0.615	0.796	0.741	0.68
DSADC	-0.017	0.04	-0.045	0.067	0.023	-0.005	-0.196**

Notes: The Logistics Performance Indicator data are obtained from Logistics performance survey data (2009). * p<.1; ** p<.05; *** p<.001