2002 Annual Forum

at Glenburn Lodge, Muldersdrift

Prospects for Increasing Trade among SADC Countries

Sophie Chauvin and Guillaume Gaulier

Centre d'Etudes Prospectives et d'Informations Internationales (CEPII)

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ABSTRACT

In September 2000, the SADC FTA has been launched wherein full liberalization of trade is expected by 2012. The SADC FTA is intended to act as a catalyst for increased regional integration. Nevertheless what are the benefits expected from the SADC FTA given the economic structure disparities existing among its participating members? Is it really feasible to expand intra-SADC trade? To address the potential of increasing intra SADC trade we present and analyze three complementary approaches. The first two ones refer to trade indices: export diversification indices, revealed comparative advantages and trade complementarity indices, and the last one is based on gravity model. Given that SADC countries have concentrated and similar comparative advantages, our static analysis suggests that the room for further trade within SADC is limited. Nevertheless, some results and ongoing researches show that development of intra industry trade might have trade creation effects in the region.

1. INTRODUCTION

The increasing integration of the world economies has revived interest in regional integration scheme, as a first step in the process of globalization. Africa is not left apart from the process of globalization. Hence, the fear of marginalization together with the fact that, most of African countries are too small on their own to negotiate with powerful trading blocs, has led to increased interest towards regional integration. Moreover, regional trade liberalization is also seen, by its proponents, as a mean to contribute to the African development through fostering economic growth.

Africa has been experimenting with economic integration for quite a long time now (half a century). As a result Africa records around 11 economic blocs such as the Economic Community of Western African States (ECOWAS), the Common Market for Eastern and Southern African (COMESA) or the Southern African Development Community (SADC). Progress on Africa regional integration has nevertheless been slow due to several factors: overlapping membership, the lack of authority and bureaucratic sophistication to deal with bigger powers, political turmoil in some countries. All of these factors have contributed to slow down the process. Therefore, Africa's alliances have concentrated more on liberalizing trade within the region than with the rest of the world. Thus, protectionism has been easy to justify insofar as less developed, less diversified economies are also less able to weather the transition to Free Trade. For this reason, separate blocs exist within the larger ones and most countries are members of more than one block. When it comes to extra-African trade agreements, these multiple memberships cause problems. As a whole, the blocs are far from fulfilling their potential and far from giving its longed far voice in world trade.

The Southern African Development Community (SADC) is generally seen as one of the richest region in Africa. The participation of South Africa, the largest country of the continent, to SADC provides the basis for successful economic cooperation . In September 2000, SADC launched the SADC Free Trade Area. Under the accord, SADC countries would phase out tariffs on all 'non-sensitive' products by 2008 and fully liberalized trade is expected by 2012. The SADC FTA is intended to act as a catalyst for increased regional integration and to facilitate trade and investment flows within the region.

Several questions may be raised concerning the Southern African economic integration. Indeed, what are the benefits expected from the SADC FTA given the economic structure disparities existing among its participating members? Given the present SADC economics' structures and level of development, is it really feasible to expand intra-SADC trade? To answer these questions, we will first, in section 1, present SADC historical background as well as the structure of SADC countries and their trade links. Then in section 2 we will assess the potential for increasing intra SADC trade through three complementary approaches: exports diversification indices, revealed comparative advantages and trade complementarity indices and a gravity approach.

2. SOUTHERN AFRICAN DEVELOPMENT COMMUNITY: AN OVERVIEW

2.1 SADC Regional Integration: Historical Background and Related Issues

In face of the globalization phenomena, regionalism has received much more attention, especially in Africa as a result of growing fears of African marginalisation. Regional trade integration is generally seen as a mean of fostering economic growth and development through increased of intra-regional trade and cross border investment. Nevertheless the debate on trade liberalization and growth is still open among academicians. Indeed, neither theory nor empirical results provide a clear-cut answer to the question[1].

Several regional initiatives are pursued across Africa. The Southern African Development Community (SADC) evolved out of the South African Development Coordination Conference (SADCC). This latter was created in 1980 and was more intended to provide a bulwark against the Apartheid system prevailing in South Africa than to foster a regional trade arrangement. SADCC became SADC in 1992 and broadened its concerns to facilitating regional economic integration. The participation of South Africa in 1994 enhanced the viability of the SADC as an economic community. For now, SADC encompasses 14 members[2]. One of the main features of the SADC is related to the sector coordination approach applied: each member countries is responsible for coordinating sector programs.

In 1996, a Trade Protocol was signed with the purpose of establishing a Free Trade Area early in the next decade. In this regard, various work have been done relating to the determination of tariff reduction schedules, rules on the origin of goods and services, the elimination of non-tariff barriers, as well as harmonization of customs and trade documentation and dispute settlement mechanisms. The SADC Free Trade Area is a product of the SADC protocol. 11 of the 14 SADC members signed on 7 august 2000 this regional Free Trade accord that took effect on first of September 2000. Under the accord, SADC countries would phase out tariffs on all '*non-sensitive*'[3] products by 2008[4], and by 2012 the grouping expects fully liberalized trade. As part of the agreement Mozambique, Tanzania, Malawi and Zimbabwe –the four poorest SADC members- would be given special trade preferences on clothing and textiles for the first five years of the protocol. Angola, Congo and Seychelles are not signatories to the trade deal.

SADC is not the only regional integration initiative in which Southern African countries are currently participating. Several countries are also members of the

[1] See Rodriguez and Rodrik (1999).

[2] Angola, Botswana, Republic Democratic of Congo (joined in 1997), Lesotho, Malawi, Mauritius (1995), Mozambique, Namibia, Seychelles (1997), South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

[3] Sensitive industries encompass mainly textiles, clothing, sugar and motor vehicles (refer to Kalanga 1999, Visser 2001).

[4] It is expected that by 2008, up to 85% of all SADC trade will be traded at zero tariffs.

Community of Eastern and Southern Africa (COMESA); other are involved in the Cross-Border Intitiave (CBI); while a small subset of members are participating in the long standing Southern Africa Customs Union (SACU) and the Common Monetary Area (CMA).

Box 1: Economic Cooperation in Southern Africa: an overview

Southern African Customs Union (SACU): originally formed in 1910 with South Africa and the BLS (Botswana, Lesotho and Swaziland) and renegotiated in 1969. Namibia, considered as a fifth province of South Africa until independence in 1990, was a de facto member of SACU. Namibia joined formally SACU in 1990. All the countries are also members of the Common Monetary Area, with the exception of Botswana. Under the SACU agreement, a common external tariff is applied. One of the main feature of the SACU agreement is its revenue sharing formula which include a 42% enhancement factor to compensate the BLSN for the price raising of the CET as well as for participating in a customs union with a more developed country (and thus to compensate for possible trade diversion effects and polarization of industrial development between core and peripheral areas). SACU receipts have been for long an important source of public revenue for the BLSN. Since December 1994, the BLSN and South Africa countries have started to renegotiate the terms of the formula and the decision making process for setting both trade policy and the distribution of collected import duties.

Common Market for Eastern and Southern Africa (COMESA): Previously named the Preferential Trade Area, which was set up in December 1981 supported by the UNECA. In the 1990's, PTA encountered 17 members (Angola, Burundi, Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Sudan, Swaziland, Uganda, Tanzania, Zambia and Zimbabwe). The slow progress of the PTA towards trade liberalization has resulted to the signature of a new treaty establishing COMESA in December 1994. COMESA included in addition Madagascar and Mauritius. Lesotho and Mozambique withdraw from COMESA in 1996. COMESA's original objective was to establish a common market by 2000 and ultimately an economic union.

Cross Border Initiative (CBI). The CBI was jointly launched in 1992 by the African Development Bank, the European Union, the IMF and the World Bank as a mechanism to foster continued trade liberalization, increased cross border trade, facilitate investment and payments in Eastern and Southern Africa and the Indian Ocean. Countries are expected to harmonize import tariff regimes, converge towards a moderate external tariff and to reduce internal tariffs and non-tariffs barriers significantly. 14 countries are participating to the CBI: Burundi, Comoros, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. South Africa did not join. The original deadline for removing intra-CBI NTBs and tariffs (1996) has already passed.

The Africa Growth and Opportunity Act (**AGOA**) signed with the United States in 2000 offers tariff reduction on over 5000 products. Several countries, such as Lesotho have benefited from this agreement even though the US law provides only a temporary advantage.

The 'Everything But Arms' (**EBA**) Initiative with the European Union provides full access to the EU markets for the world's 49 Least Developing Countries (which includes the SADC countries Lesotho, Malawi, Mozambique, Tanzania and Zambia). The EU has removed tariffs and quotas on most imports except arms and there are three exceptions (sugar, bananas and rice) which have a longer phase out period.

Several **bilateral trading** arrangements exist also between South Africa and other SADC countries (Zimbabwe for clothing and Textiles, Malawi and Mozambique). Zimbabwe has bilateral trade agreements with South Africa, Botswana and Namibia. The SACU countries have a free trade agreement with Malawi.

While negotiations on trade commenced between South Africa and the EU in 1995, the trade, development and co-operation agreement with the European Union was signed at the end of 1999.

The overlapping membership raises several issues. Indeed the overlap might be source of tensions between the institutions involved and as a result of the rules of origin (which can cause trade diversion).

2.1.1 Gains Expected from SADC Free Trade Area

Several gains are expected from the SADC FTA. The traditional analysis on preferential trade arrangements (Custom union or FTA) are related to the overall (static) gains resulting from the net effect of trade creation versus trade diversion[5]. If trade creation outweighs trade diversion, then it is welfare enhancing. Theory suggests that this is likely to happen if countries are complementary and then able to exploit their different comparative advantage. Trade diversion is also likely to be less if members' external tariffs are lower. The degree of benefits (or asymmetry of gains) may vary from country to country.

The case of SADC is interesting insofar as it encompasses 14 different countries within which South Africa dominates. The potential benefits of the FTA, the smaller countries of SADC might reaped are the following:

- Access to an enlarged market which can foster economic growth because of economies of scale in domestic production[6];

- Increased competition and hence opportunities for improving efficiencies. While exposure to South Africa competition will inevitably eliminate some production, more efficient firms will improve productivity and output. Moreover, exposure to South Africa competition will help prepare smaller countries for greater integration into the world economy, by enhancing both quality and productivity, and thereby competitiveness (Jenkins, 2001);

- Increase investment and higher total factor productivity growth from better access to technology. Within SADC, a number of countries have very low tariffs on capital goods (notably South Africa). Whether a free trade area moves towards the lowest group-wide tariffs per sector, all SADC members would benefit from a lower price of capital goods, hence stimulating investment (Tsikata, 1999). Moreover, more rational tariff regimes might encourage greater partnership and foreign investment. Finally, the smaller countries are likely to face improvement of their TFP as a benefit of South Africa's more advanced technological knowledge;

- Increased intra-regional trade along with inflows of foreign capital (mainly South African) can help to boost industrial development and in the diversification of the export base;

[5] Trade diversion occurs when lower cost imports from non-members are replaced by higher cost imports from another union member. While trade creation occurs when domestic production in a union member is replaced by lower cost imports from another member nation. To the extent that a free trade arrangement does not force participating countries to commit to a common external tariff, trade diversion effects can be minimized. The country can unilaterally liberalize in order to obtain the least cost import.

[6] It might nevertheless be argued that the enlarged market set up by the SADC countries might still be considered as small by wider international standard.

- According to certain, trade might promote convergence insofar as regional trade groups form convergence clubs, where poorer members catch up richer ones through the process of trade. Jenkins (2000) tried to assess whether convergence might occur in SADC. According to her conclusions, within SADC as a whole, economies diverged over the 30 years from 1960 to 1990, but clear convergence has occurred between the members of SACU. There is no reason to expect that the SADC countries should have converged, as free trade in the community is a very recent ideal. However, within the customs union movements of goods have been free for most of the twentieth century and the smaller members have grown rapidly, particularly since the early 1970s. Access to the South African market has probably allowed smaller members to escape the limitations imposed by small domestic markets;

- Regional trade agreement may also serve as a useful economic purpose by reducing uncertainty and improving credibility which may be conducive to a better environment for the private sector to plan and invest.

Beside smaller members, South Africa has also to be considered. The main benefits South Africa might reap from the FTA are twofold:

- Firstly, South Africa can have increased market share and development of new markets especially for manufactured goods in SADC. Indeed South African products might be more competitive in the SADC region than in other world markets such as in America and Asia;

- Secondly, slower inward cross-border migration resulting from growth effects expected in the SADC countries. This might reduce negative externalities for South Africa.

2.1.2 Potential Drawbacks

The establishment of the SADC FTA may raise concerns, as it will entail some costs. Thus the distribution of costs and benefits have to be outlined.

Firstly, prospect for convergence should not be overestimated. Indeed liberalization can lead to an intensification of the specialization. A country weakly specialized in a growth-engine sector i.e. a sector that has plenty of potential for technological progress or in goods with a great potential for learning, can with openness be excluded from this sector and therefore be subject to low growth (Bensidoun, Gaulier, Ünal-Kesenci, 2001). Indeed, if a country is ex ante specialized in primary products, liberalization is likely to intensify this specialization at the expense of more dynamic sectors (manufacturing).

Secondly, the possibility of polarization effect might be of concern. Indeed, the emergence of few poles of industrialization and the polarization of investment towards the larger and more diversified economies of the region is possible. This might raise the issue of the setting up of compensatory payments like what is currently operating within SACU[7].

[7] Under the SACU agreement, a revenue sharing formula is used for compensating smaller countries for the trade diversion effects that might penalize them. But, as Jenkins (2000) mentions, the SACU is

Thirdly, as shown in **Table 1**, customs revenue represents a significant source of government revenue for most of SADC members. According to Tsikata (1999), given the heavy reliance on imports duties by most of SADC countries as a source of revenue, and given the extent and pattern of trade among themselves, a move to a pure FTA within SADC would involve significant short term fiscal costs for most of member countries (except South Africa). This suggests that any trade reforms will have to be accompanied by appropriate fiscal revenue policies to compensate for this loss of revenue[8].

Moreover, the FTA may lead to changes in the sectoral and regional structure of individual economies that are likely to affect the overall level of tax revenues. Indeed the growth in cross-border trade and investment will lead to a contraction of some traditional, especially import-substituting industries that have been historically important sources of tax revenue.

Table 1: Percentage of total government revenue by type of tax in 1996

	CUSTOMS REVENUE	DIRECT TAX	INDIRECT TAX
Angola	Na	Na	Na
Botswana	15.4	21.0	4.5
Lesotho	45.0	13.4	11.1
Malawi	22.0	45.0	26.1
Mauritius	33.5	26.5	25.6
Mozambique	22.2	14.1	50.9
Namibia	29.8	26.4	32.0
South Africa	1.8	56.1	38.6
Swaziland	49.4	27.2	14.4
Tanzania	27.6	21.9	26.2
Zambia	11.6	36.4	43.7
Zimbabwe	16.1	42.3	26.5

Source: 'Review of Taxation Policies and Government Revenue', R. Hess in Gaining from Trade in Southern Africa: complementary Policies to underpin the SADC Free Trade Area, edited by C. Jenkins, J. Leape and L. Thomas, MacMillan Press Ltd, 2000.

As seen in **Table 2** below and according to Leape (2000), the most affected countries in terms of expected losses in revenue are Malawi, Mauritius and Zimbabwe with an estimated above 5% loss per cent of revenue (based on the share of customs revenue

a full currency union wherein South Africa is the net exporter to a region protected by a common external tariff. Under a FTA arrangement, there is no question of either the unilateral setting of tariffs by South Africa or the price raising effect of a CET. The argument for compensation within SADC FTA is thus based on the dominance of South Africa in regional trade and the fact that it is likely to increase as well as on the probability that South Africa will attract FDI at the expense of its smaller neighbors.

[8] Leapes (2000) explores a range of fiscal adjustment measures that can be used to offset the losses in customs revenue as well as measures that can ensure that governments secure the full fiscal benefits of higher long-run growth. These includes both policy coordination measures, such as increased in tax rates or steps to broaden the tax base, and institution-building measures such as improved tax enforcement and enhanced control of expenditure.

in total government revenue in 1996). Lesotho and Swaziland are the most dependent on customs revenue of all SADC members, and thus potentially the most vulnerable to the adverse fiscal effects of trade liberalization. Nevertheless, the very low level of SACU imports from other SADC countries means that the impact of the SADC FTA is relatively small.

Table 2: Estimated impact of SADC FTA on government revenue

	(A) % CHANGE IN CUSTOMS REVENUE	(B) CUSTOMS REVENUE AS % OF TOTAL[2]	(A)*(B)=(C) PER CENT CHANGE IN TOTAL REVENUE	TAX REVENUE PER CENT OF GDP	TOTAL REVENUE PER CENT OF GDP
Angola	-1.8	4.3	-0.08	35.7	36.3
Botswana[1]	-3.0	15.4	-0.46	15.0	37.4
Lesotho[1]	-3.0	45.0	-1.35	47.1	69.3
Malawi	-23.9	22.0	-5.26	16.0	17.3
Mauritius	-17.0	33.5	-5.70	16.3	19.0
Mozambique	-5.8	22.2	-1.29	16.7	18.3
Namibia[1]	-3.0	29.8	-0.89	31.5	36.1
South Africa[1]	-3.0	1.8	-0.05	25.6	26.4
Swaziland[1]	-3.0	49.4	-1.48	33.1	34.7
Tanzania	-5.8	27.6	-1.60	18.1	20.0
Zambia	-28.7	11.6	-3.33	31.5	34.2
Zimbabwe	-32.2	17.2	-5.55	26.4	29.6

Source: 'Taxation and Fiscal adjustment', J. Leape in Gaining from Trade in Southern Africa: complementary Policies to underpin the SADC Free Trade Area, edited by C. Jenkins, J. Leape and L. Thomas, MacMillan Press Ltd, 2000.

[1]Evans[9] (1997) uses a partial equilibrium Regional Trade Model for Southern Africa in order to estimate the impact of the proposed FTA on imports and exports from SADC and the rest of the world, domestic production of importable; employment and customs revenue. He estimates the change in customs revenue for SACU and not for individual members of the customs union. This estimate has been applied to each of the five members of SACU. SACU countries have customs and excise figures combined.

[2] 1996, except for Angola and Mozambique where data is for 1994 and 1995, respectively.

Fourthly, short-term costs can include output and employment losses, as the removal of tariffs under the FTA will have differential effects on sectors, sub-sectors and firm in each country. Overall, the employment effects of the FTA should be small, even though the largest losses in employment are likely to occur in the 'sensitive industries' (Maasdorp, 2000).

Finally, the political tension existing in several SADC countries is also of concern as it can slow down the pace of the integration process.

[9] As noted by Leape (2000): *'Evans estimates the effects of the FTA under two scenarios: (i) zero growth in SADC and the rest of the world and improved access to extra-regional markets; (ii) 3% growth and a 3% increase in access to extra-regional markets. We have based our calculations on the first scenario – in that respect these findings may be seen as a worst-case outcome*.'

In face of these various issues, regional trade liberalization should not be considered in itself without broaden policies framework that might also contribute to help reaping all the benefits of the trade liberalization (insofar as inconsistencies between macro economic policies and trade regimes might undermine liberalization). In this respect, there is a need for SADC governments to adopt national macro and micro policies that are consistent with promoting trade and investment. Jenkins, Thomas and Leape (2000) identify two critical indicators of policy compatibility in SADC: budget deficit and real exchange rate. First, trade liberalization is aimed through development, among other things, to diversify the export base so as to reduce the dependency of countries toward primary commodities. Thus, diversification will require investment. But whether governments run huge budget deficit, it might put pressure on interest rates to maintain macro economic balance and thus increase both the direct costs and risk of investment. Moreover the financing of budget deficit may lead to either over-indebtedness or crowding out which means that large budget deficit are not compatible with trade liberalization. Jenkins, Thomas and Leape (2000) underline that at least half of SADC members need to pursue and sustained tightening of the fiscal stance if they are to gain from the FTA. Second, appropriate exchange rate policy is important in supporting trade liberalization. Thus a removal of trade restriction must be accompanied by currency depreciation to provide some short-term protection for domestic producers. Moreover an overvalued exchange rate will not enhance investment in the production of processed exports.

In addition trade liberalization need to be accompanied by the establishment of appropriate micro economic policies in order to increase private sector investment and mitigate any adverse employment effects, insofar as the removal of tariffs under the FTA will have a differential effect on sectors and firms in each country. Finally, SADC FTA should entail convergence of external trade policy and a certain level of consensus on industrial restructuring within the region and particularly around sectors still considered as 'sensitive'.

Box 2: The Position of South Africa in the Region

South Africa represents 70% of SADC's GDP placing the country in an asymmetric position vis-à-vis the rest of the SADC region. South Africa is also running a substantial trade surplus with each of its regional trading partners. This imbalance has widened considerably since the 90's and is likely to continue regardless of whether a free trade area is established or not. Indeed, as we will see in **sub-section 1.3**, South Africa is a larger exporter to SADC countries, while remaining a small importer. This unbalanced trade scheme has become a source of strain within the region. As noticed by Kalenga (1999): *"Theoretically, such trade deficits do not really matter, and should not be bad for the region's economies. However, this becomes only problematic to the extent that there are critical obstacles to the region's exports, which can effectively compete in the South African market.*" On this issue, Jenkins (2001) also underlines that South Africa's trade regime has exacerbated the difficulties faced by its neighbors in gaining access to its significantly larger market. As outlined by the Author: *'Although South African rates of effective protection are not particularly high for many goods, selectivity created a tariff structure characterized by large differences in tariff levels between and within sectors. Consequently, the moderate average level of protection in South Africa does not necessarily imply that the countries of the region have not faced a high tariff wall: effective rates of protection have in fact been highest for those products which are, or could be produced, in the region (like earthenware, clothing, footwear, textiles, foodstuffs and wood products). In some of these industries, protection made penetration of the South African market, without preferential access, impossible. Moreover, South Africa has not hesitated to erect tariff barriers against neighboring countries when their exports are seen as threatening to South Africa's interests, even countries within SACU (car imports from*

Botswana in 1995) or in violation of a trade agreement (textile imports from Zimbabwe in 1992). These problems are now, in the main, being addressed, as South Africa has virtually eliminated quota restrictions and is reducing tariffs.'

Moreover the increased penetration of South Africa in SADC markets might be seen as a source of threat for its neighbors as it suggests that intra competition is likely to be more pronounced than when South Africa was facing international sanctions.

2.2 SADC Performance and Economic Structures

Over the past twenty years, growth performance in Africa has been relatively poor compared to that of other developing region. As can be seen from **Table 3**, during the 1980's, average annual growth in sub-Saharan Africa was just 1.92%. While between 1960 and 1980, the difference in average annual growth between sub-Saharan Africa and other emerging blocs such as Mercosur and South East Asia was not so important, the gap increased especially against Asian countries over the 80's.

Regarding Southern Africa, the growth performances among countries of the region vary quite sharply, reflecting the diversity of the economies of the region. In the 1980's, average growth rates ranges from 10% in Botswana to -0.4% in Mozambique. Between 1991 and 1999, real GDP growth was 6.4% in Mozambique compared to –5.9% in DR Congo. Although the SADC region is usually regarded as one of the richest region in Africa, the growth performance of the SADC countries remain nevertheless low compared to other emerging blocs.

Table 3: Real GDP (PPP) growth rate

	1960-1980	1981-1990	1991-1999
Angola	2,5	3,3	0,7
Botswana	4,2	10,3	4,0
Congo,Dem. Rep.	1,5	0,7	-5,9
Lesotho	2,5	4,7	6,1
Malawi	2,3	3,1	3,3
Mauritius	1,4	6,0	5,1
Mozambique	2,5	-0,4	6,4
Namibia	na	na	na
Seychelles	1,8	4,8	3,1
South Africa	3,1	0,6	1,7
Swaziland	4,8	7,0	2,8
Tanzania	2,2	2,9	2,8
Zambia	1,8	0,5	1,1
Zimbabwe	3,1	3,5	1,4
SACU	3,1	0,9	1,9
SADC	2,6	1,4	1,2
Sub Saharan Africa	2,2	1,9	2,2
Mercosur	2,5	1,7	3,4
South East Asia[1]	3,1	5,4	4,2

Source: Author's calculation based on CEPII CHELEM database. [1] South East Asia encompasses Malaysia, Philippines and Thailand.

Nevertheless some progress have been recorded among Southern African countries. Thus, Botswana is usually quoted as the '*success story*'[10] in Africa and in 1999, four SADC countries achieved growth in excess of 4%, with Mozambique recording 7.3%, Botswana and Tanzania around 4.5% and Malawi 4%. Nevertheless a further acceleration of growth in most SADC countries is necessary to provide a dent into unemployment and poverty. Indeed according to the SADC Secretariat the SADC region requires an average growth rate of more than 6% to make an impact on poverty.

The improved economic performance of Southern Africa since mid nineties results in part from better economic policies and structural reforms that led to an improvement of macro-economic indicators (reduced inflation rates, budget deficits). Progressive trade liberalization was also an important component of the opening up of the economies and of the strengthening of export performance.

One of the main aspects of economic performance in Southern Africa sub-region is that it is dominated by that of the Republic of South Africa, the largest economy of the region. Indeed South Africa represents more than 70% of the combined sub-regional GDP and about 32% of its population. The role of South Africa is also important through trade and transport. With respect to transport, Malawi and Zimbabwe, notably, are highly dependent on South African ports with 90% and 60% respectively of their trade passing through South Africa. Countries in the sub-region also depend significantly on South Africa's railways, highways, airports and other transit transport facilities (Tsikata, 1999).

SADC countries vary considerably in population and land area. Together the 14 member countries of SADC cover 9066840 square km (the equivalent of the USA or China), have a population of over 194 million and have a combined GDP of 178 billion of US dollar in 1999. The DRC is the largest country of the region with the highest population of about 49 millions. At the other extreme, Seychelles, the small island covers only 0.45 thousand square km and has a population of 800 000. The other remaining countries vary widely in both land area and population size.

The GDP per capita vary also largely across countries. In 1999 the real GDP per capita of ranges from USD 156 in Malawi to more than USD 7000 in Seychelles. Even among the richer countries in the group (Mauritius, South Africa, Namibia and Botswana), the per capita income numbers are deceptive insofar as marked inequality prevails within their countries. Indeed analysis of income distribution in Africa shows a fairly degree of inequality. Compared with other regions in the world, Africa has the second most unequal income distribution next to Latin America. And while the Gini coefficient for Africa as a whole is 44.4%, the highest values for inequality are recorded for South Africa, Kenya and Zimbabwe with a Gini coefficient above 50% (UNECA, 1999).

[10] According to Rodrik (1998), while exports of diamonds have contributed to Botswana's phenomenal economic performance, its distinctive performance is grounded in prudent fiscal and macro economic policies, relatively well-developed human resources, and an early demographic transition.

The economic structures of the SADC countries also reflect great heterogeneity. The SADC countries fall into two broad groups: those that rely on agriculture and those that are mineral based. The main economic activity of Mozambique, Malawi and Tanzania remain the agricultural sector. In Mauritius the economy has been for quite some time driven by the agricultural sector. But due to adjustment program undertaken in the early 80's, economic development has been foster through export led industrialization, agricultural diversification and the expansion of the tourist industry. And now the manufacturing sector has outweighed the sugar industry as the main pillar of the economy. Seychelles records the highest part of services, which results from the importance of the tourism sector. The mining sector continues also to be one of the most important sectors for some countries such as Namibia, Zimbabwe, South Africa, Botswana and Angola.

2.3 SADC Trade Link and Structure

The trade structure of SADC countries is important to analyze as it can have mixed implication for the regional trade agreement. Indeed, on the one hand, a more concentrated export structure (and even similar structure) of SADC countries might increase the possibility that the group's imports will have to be met by third countries. On the other hand, the economic diversity of the economies might suggest the existence of potential complementarity in trade. In this case, SADC may be able to exploit its different economies along lines of the comparative advantage. In particular, the more industrialized countries of the region (South Africa and to a lesser extent Zimbabwe and Mauritius) might be able to meet a large portion of SADC's imports needs. However, it might also raise concerns related to the problem of polarization effect toward South Africa and its spillover effects.

On a general level, SADC countries are increasing their trade with each other since the 80's.

On the export side, while the share of exports (**Table 4**) from SADC countries sold within the bloc amounted to only 0.90% in 1980, it increased to 10% in 1999 (For indication, regional trade groups have experienced some success in increasing the share of intra regional exports: most notably, Mercosur intra exports rose from 14.1% in 1991 to 25.1% in 1996). Since mid nineties SADC as a destination of exports is important for Zimbabwe , Mozambique, Malawi and to a lesser extent South Africa. Tanzania and Zambia have also seen their share of SADC in their exports increased particularly after 1995.

Table 4: Share of SADC in each country exports, in %

SHARE OF SADC IN COUNTRIES EXPORTS	1980	1985	1990	1995	1999
ANGOLA	0,03	0,00	0,01	0,03	0,7
CONGO DEM. REP.	0,05	0,03	0,1	6,0	0,3
MALAWI	12,4	15,4	1,6	17,2	16,9
MAURITIUS	1,4	0,1	1,2	1,4	1,4
MOZAMBIQUE	1,1	0,3	0,2	32,1	17,4[1]
SOUTH AFRICA	0,7	2,8	2,5	10,7	11,5

SEYCHELLES	10,5	0,8	0,4	1,4	1,2
TANZANIA	5,2	0,1	0,5	1,4	7,4
ZAMBIA	0,9	3,1	0,8	3,8	7,8
ZIMBABWE	1,3	25,0	30,7	31,7	28,0
Intra-SADC trade	0,9	3,4	3,1	9,9	10,0

Source: Author's calculation. Based on World Trade Analyzer data.[1] data for 1998

As apparent from **Table 5**, South Africa dominates trade by supplying around 77% of intra SADC exports in 1999. Zimbabwe is the next most important exporter to the region by contributing to 14% of total intra SADC exports in 1999. Malawi and Tanzania, who were also relatively important exporters to the SADC in the 80's, have seen their contribution to intra SADC exports decreased dropping respectively from 11.1% and 9.6% in 1980 to 2.3% and 1.3% in 1999. At the same time Zimbabwe and South Africa have increased their exports to the region.

Table 5: Contribution of each country to intra SADC exports, in %

SOURCE OF INTRA SADC EXPORTS	1980	1985	1990	1995	1999
ANGOLA	0,2	0,0	0,03	0,03	0,9
CONGO DEM. REP.	0,4	0,1	0,1	2,7	0,1
MALAWI	11,1	6,1	0,5	1,9	2,3
MAURITIUS	2,2	0,1	1,4	0,6	0,6
MOZAMBIQUE	1,8	0,1	0,1	1,4	1,6[1]
SOUTH AFRICA	64,2	50,5	56,0	76,5	77,8
SEYCHELLES	0,2	0,0	0,0	0,0	0,1
TANZANIA	9,6	0,1	0,2	0,3	1,3
ZAMBIA	4,4	4,1	1,0	1,3	2,0
ZIMBABWE	6,0	38,9	40,7	15,4	14,9

Source: Author's calculation. Based on World Trade Analyzer data. [1] data for 1998

Table 6: Products exported as % of SADC total intra exports

		1980	1985	1990	1995	1999
Food & live animals	00	18,5	16,4	16,6	13,6	15,7
Beverages & tobacco	10	2,9	4,0	3,5	3,9	4,9
Crude materials excl. fuels	20	4,5	10,0	8,3	5,7	4,0
Mineral, fuels etc	30	3,4	16,6	5,4	9,9	7,8
Animal, vegetable oil, fat	40	0,6	1,0	0,6	0,9	0,9
Chemicals	50	9,7	15,1	13,3	11,6	14,0
Basic manufactures	60	35,0	21,5	30,4	25,5	21,1
Machines, transport equipment	70	15,7	8,2	14,2	21,4	23,7
Misc. manufactured goods	80	9,4	4,4	5,2	6,5	7,7
Goods not classified by kind	90	0,3	2,7	2,5	1,0	0,2

Source: Author's calculation. Based on World Trade Analyzer data.

As can be seen from **Table 6**, the range of products traded within SADC has not been submitted to significant changes. Indeed since the 80s, intra SADC trade concerns mainly food, chemicals, basic manufactures and machines and transports.

The importance of South Africa and Zimbabwe is confirmed by an analysis of exports by products South Africa is a particularly strong exporter to the region in commodities requiring more capital intensive techniques and greater levels of technology skills (machinery and transport equipment, chemicals….) In this category, South Africa accounts for over 90% of intra regional exports. Zimbabwe exports a significant share of food, beverages and crude materials

On the import side, while in 1980, 1.6% of total SADC imports were supplied by SADC members, by 1999, this share amounted to around 10.2% (**Table 7**). For indication, intra Mercosur imports that amounted to 17.8% of total Mercosur in 1991 raised to 20.43% in 1996. South Africa, Mauritius, Tanzania and Seychelles are the least dependent on SADC imports. For Mauritius and Tanzania, this might be explained by the closer and older historical relationship with members of the Eastern Africa Community. On the other side Malawi, Mozambique (since 1995), Zambia and Zimbabwe rely heavily on SADC imports with more than 50% of their imports originating from SADC.

Table 7: Share of SADC in each country imports , in %

SHARE OF SADC IN COUNTRIES IMPORTS	1980	1985	1990	1995	1996	1999
ANGOLA	0,0	0,6	0,8	7,1	18,9	10,0
CONGO DEM. REP.	0,4	1,6	1,1	18,1	14,6	31,6
MALAWI	36,7	53,0	24,8	49,2	62,5	64,4
MAURITIUS	14,5	4,2	9,9	11,3	9,5	11,2
MOZAMBIQUE	3,7	5,0	7,6	55,5	54,3	58,6
SOUTH AFRICA	0,1	1,8	1,8	2,1	2,3	1,9
SEYCHELLES	12,3	10,2	14,8	14,0	13,7	14,3
TANZANIA	0,7	0,7	1,3	13,9	8,6	13,3
ZAMBIA	1,2	10,9	7,9	49,1	54,7	65,5
ZIMBABWE	8,3	31,7	33,1	51,2	49,4	51,2
Intra-SADC trade	1,6	4,7	5,1	9,9	11,0	10,2

Source: Author's calculation. Based on World Trade Analyzer data.

Within SADC, Zimbabwe and to a lesser extent Mozambique, Zambia and South Africa form a major destination of imports in mid nineties.

Several factors may explain the increase in intra-SADC trade over the nineties. First, the end of the apartheid system entailed South Africa to participate more actively in regional trade. Second, a number of SADC countries undertook trade liberalization reforms that significantly removed the barriers to trade that were in place (**Box 3**).

Box 3: Overview of Trade Policy Framework in Southern Africa

Southern African Economies have led interventionist and protectionist trade regimes for quite a long time. On the import side, extensive use of restrictive licensing systems, high tariffs with escalated and cascading structures, varying degree of import prohibitions and tight foreign exchange controls were implemented. While on the export side, there was substantial implicit and explicit export taxes and prohibition of certain items for exports (Kalanga, 1999). The reasons behind these measures were twofold: promoting industrialization through import substitution and raise government revenue. Changes have occurred since the mid 80's due to the undertaking of reforms (as part of IMF/World Bank structural adjustment program). This was followed by countries commitments to reduce tariffs under the Uruguay Round outcome. Within the region, the participation to regional arrangements further led to liberalization of intra regional trade among some SADC countries. This has resulted in lower tariff rates and less dispersion in tariff regimes in individual countries. Most SADC countries have considerably reduced trade policy related to non-tariff barriers (NTBs) such as quantitative restrictions on imports. But significant NTBs still exist, and remain the most critical obstacles to trade. These include quantitative restrictions on certain imports such as agricultural imports (maize, wheat, dairy products), automatic import licensing system. Other NTBs related to surcharges on imports, customs documentation and related procedures, border related controls and transportation of goods and persons, foreign exchange bottlenecks which tend to discourage trade transactions, delays in payments, clearance and settlement systems. In almost all countries, highest rates are being applied to consumer goods, middle rates to intermediate goods and lower rates to capital goods and raw materials.

The structure of protection has declined in all SADC countries, with the exception of Angola and the DR of Congo. According to Kalanga (1999), with respect to SACU, South Africa initiated the reduction of its complex tariff structure from about 12 500 tariff lines in 1990 to 8250 in 1996. The target was to reduce the number of tariff rates from approximately 210 in 1990 to 6 in 1996. This was, however, not achieved fully by 1996, but significant progress has been made to this effect. Nevertheless, special provisions for the 'sensitive industries' (such as textiles, clothing, footwear, sugar and motor vehicles) were made. These sectors remain a source of discontent in South Africa's trade relations with the non-SACU SADC countries that desire more market access into its market. While SACU has low trade weighted and simple mean tariffs, it still has a large number of rate bands and high levels of dispersion. SACU, Mauritius and Zimbabwe have the highest tariff peaks. Zambia has the most liberal trade regime in SADC, characterized by a moderate cascading tariff structure ranging from 0% to 5% for most capital goods and raw materials, 15% for intermediate goods and 25% for finished goods.

One of the main issues for the SADC trade integration process lies in the trade surplus South Africa records vis-à-vis other SADC countries. According to TIPS (2000) several factors may explain this trend: Firstly, many SADC countries have been liberalizing their economies in the last two decades engendering increased imports to GDP ratio's in most countries. Secondly, while many SADC countries may have high overall trade deficit with South Africa their overall trade balances may not have changed significantly. Thirdly, the trends may indicate that, rather than contributing to unsustainable balance of payments problems, South Africa has gained increased market share in the SADC countries (substitution effects). This can partly be attributed to the post sanctions effect where many of the country's exports, specifically in manufactures faced sanctions in these markets.

The fact that South Africa is a large exporter to SADC, but is a minor importer, suggests that complementarity are low between South Africa and the rest of the SADC region. As already mentioned this unbalanced trade may also results from trade barriers (formal or informal) specific to the South African market, at least for specific industries. In this case, the surplus of South Africa vis-à-vis SADC might be

source of concerns if it results from trade diversion owing to tariff advantages for South Africa on the SADC market or from the increasing difficulty (for SADC countries) of penetrating a protected market.

Therefore, whether the SADC FTA will result in overall gain will depend not only on the reduction of external tariffs by members but also by the improvement of the access of the non-SACU members of SADC to the South African market. On this issue, Kalanga (1999) underlines that there are countries in SADC, which are competitive exporters of certain products to the rest of the world and that South Africa does import these products from the rest of the world as well (products such as food, beverages and tobacco, refined copper, cotton yarn, travel goods, footwear, toys…). Nevertheless, these products had historically attracted a significant level of tariff protection under the SACU trade regime even though South Africa start to imports some of these products from SADC countries. This suggest that improved access to these goods might lead to an increase of intra regional trade[11]. Therefore, some potential complementarity might exist which can be exploited by a rapid decline in trade barriers in sectors or products revealing a regional comparative advantage. The problem is that some of these products are still considered as 'sensitive' goods and are likely to be subject to a slower liberalization process[12].

In the same vein and concerning the potential for increasing intra-SADC trade, the report from UNCTAD (1998) underlines that: '*Given the overlap in the product composition of exports by non-SACU members of SADC to the rest of the world with SACU's imports from the rest of the world, there is an untapped potential for trade between the two groups. Apart from petroleum, where the overlap is greatest, this potential mainly concerns primary products (including meat, tropical beverages, cotton, diamonds, and non –ferrous metals) and a few resource-intensive basic manufactures (such as cotton yarn, cement and some types of woven fabrics); for other manufactures the potential is limited.*'

[11] According to our data, foodstuffs, beverages and tobacco as well as textiles fibers and clothing (articles of apparels and clothing accessories) constitute a significant share of South African imports from SADC market.

[12] On this issue, it is important to note that there is ongoing progress. Indeed, following the meeting of SADC Ministers for industry and trade in July 2001 in Mozambique, the Ministers agreed to implement, with respect to textiles and clothing, the special market access arrangement between SACU and Malawi, Mozambique, Tanzania and Zambia. This arrangement provides for duty free quotas for MMTZ exports to SACU on basis of single stage transformation rule of origin to be applied from 1st august 2001 for a period of five years. Mauritius and Zimbabwe would be granted accelerated tariff reduction for their exports to SACU.

3. POTENTIAL FOR INCREASING INTRA-SADC TRADE

The potential gains and losses, SADC countries might encounter from the SADC FTA depend on the existing and expected trade pattern among members as well as on their own trade structure. Although some progresses have been recorded on intra SADC trade, this is not enough to assess whether expanding intra-SADC is feasible and/or benefic. Therefore and in order to gauge the potential and interest of increasing intra SADC trade, we will base our analysis on three complementary approaches: the first two ones are related to trade indicators and the last one is based on gravity models.

3.1 Export Diversification

It is usually emphasized that countries with more diversified exports base are suitable candidates for a successful RTA. The reasons are twofold. First, countries with more diversified exports are more likely to produce a greater range of potential products that can be trade with regional partners. As underlined by Yeats (1998), if only a limited number of such goods exists members of an RTA may have to rely heavily of third countries for a high share of their key imports (and as destination for their major exports) and this would likely reduce their commitment to the arrangement. Second, countries might become less vulnerable to export instability that could lessen their commitment to regional arrangements. Yeats (1998) notes that sub-Saharan African countries exports tend to be highly concentrated in a few products, many of which are not important in other African countries imports. This limits the potential import of any RTA among them.

Moreover the interest in diversification is based on the empirical observation that rapid economic growth seems to be accompanied by a higher degree of diversification[13].

A suitable measure of diversification should take into account all goods and services of an economy. However, and due to the fact that disaggregated data on GDP are not available at a detailed level, we have used, like Feenstra et alii (2000), an index of diversification based on the composition of countries' exports. Non-tradable goods and services are left out of our estimate. While using the diversification of exports as a proxy of output diversification may have some limitation, it has the benefit of focusing on the link between trade and growth. Exports, and more specifically diversified exports of manufactured products, enhance productivity through learning effects, opening up of investment opportunities such as for supplying inputs increases, increased competition, technology transfer, improvement of human capital.

The index of export diversification[14], which is derived from an index of concentration of the distribution of exports among products, is defined as follows:

$$DIV_t = 1/\sum_{i=1}^{n} (x_{i,t} / Xt)^2$$

With $x_{i,t}$, exports of product i in year t and X_t total national exports in year t.

[13] Refer to Berthélemy and Söderling (1999) and Berthélemy and Chauvin (2000).

[14] See Gutiéraz de Pineres, Ferrantino (1997).

The index DIV increases with the degree of diversification. Oil exports are excluded from our calculation in order to minimize the impact of the terms of trade[15].

According to our results, SADC members fall into two groups: countries that have recorded the highest export diversification indices and countries that have recorded moderate or downward trend of their export diversification. While South Africa was one of the least diversified countries over the first period, its index of export diversification is the higher over the last period. Tanzania also experienced an increased of its export diversification especially since the fourth period. Mozambique, the most diversified country in 1980 has recorded a downward, even though slight, trend while Zimbabwe who was one of the most diversified countries in 1980 did not improved significantly over time. Seychelles and Angola have first recorded an increased of their indices until the second period before going through a regular downward trend. Mauritius and Angola have experienced a moderate diversification process. Both Malawi and Congo encountered a regular downward trend. Finally, Zambia who was the least diversified country, improved slightly.

From **Table 8**, we can compare SADC countries to other emerging countries. Over the period 1992-1996, South Africa, Tanzania and Zimbabwe are the most diversified countries of the region. The progress recorded by South Africa over the period 1996-1999 are quite impressive. This might be due to their deeper integration to the world market, especially since 1994. Nevertheless even these more relatively sophisticated and dynamic countries in SADC are still very concentrated compared to other middle income countries. While in the beginning of the 80's, countries such as Seychelles, Tanzania, Zimbabwe have recorded diversification indices value around the same level as Indonesia, Malaysia, Argentina and Chile, by mid 90's the gap increased between these countries, leaving the highest diversified countries in SADC at the level of the lowest diversified country among other emerging countries, Chile (the results obtained for Chile are quite low suggesting that the country exports very specific products).

Table 8: Evolution of Diversification indices (oil excluded) for various countries (period average)

	1980-1983	1984-1987	1988-1991	1992-1995	1996-1999
Angola	2,3	7,4	3,1	2,4	1,6
Congo, Dem.Rep	3,1	2,9	2,5	3,2	2,1
Malawi	3,4	2,8	2,0	2,0	2,2
Mauritius	2,2	3,0	2,8	2,8	2,6
Mozambique	8,4	7,5	5,8	5,5	6,0
South Africa	2,8	10,6	11,0	8,7	21,4
Seychelles	4,1	5,3	2,1	1,5	1,7
Tanzania	4,0	3,0	5,7	7,5	8,1
Zambia	1,2	1,2	1,2	1,3	2,0
Zimbabwe	6,3	9,2	7,8	8,0	7,7

[15] If oil is included in the index, a sudden increase of oil prices will entail an increase of the relative importance of the petroleum sector in the economy without providing additional information about the structural changes (Berthélemy and Söderling, 1999).

South Korea	21,8	23,1	20,3	20,6	18,9
Indonesia	6,2	7,2	11,7	17,8	24,1
Malaysia	5,3	7,4	11,0	13,4	10,5
Philippines	14,2	14,2	18,7	14,8	6,3
Thailand	10,5	15,2	23,1	24,6	21,2
Argentina	8,4	10,0	14,9	16,3	16,9
Brazil	17,2	19,2	20,1	23,5	24,6
Chile	4,8	5,6	5,7	8,1	8,2

Source: Author's Calculation. For SADC countries, based on World Trade Analyzer Data (which provides data SITC 2 digit). For the other countries, based on CEPII CHELEM database, which encompasses 71 products.

Despite this export concentration, the presence of relatively industrialized South Africa and Zimbabwe (and to a lesser extent Mauritius) might offers some opportunities for complementarity. **Table 9** provides another view of the export structure by showing for each country what percentage of commodity it exports. It suggests that export structures among SADC countries are quite heterogeneous. In 1996, the leading export commodity was basic manufactures for South Africa, Beverages and Tobacco for Zimbabwe, food and live animals for Mozambique and Tanzania, miscellaneous manufactured goods for Mauritius.

Table 9: Share of commodity groups in each country's exports in 1999

		Angola	DR Congo	Malawi	Mauritius	Mozambique	Seychelles	South Africa	Tanzania	Zambia	Zimbabwe
Food & live animals	00	0,8	3,8	16,8	23,7	**51,3**	**90,3**	8,2	**60,0**	3,1	15,9
Beverages &Tobacco	10	0,0	0,0	**66,6**	0,0	1,7	0,2	1,6	9,0	1,4	**35,2**
Crude materials excl. fuels	20	0,1	6,6	1,9	0,9	19,2	0,3	10,4	14,9	11,9	15,6
Mineral, fuels etc	30	**80,5**	9,1	0,2	0,0	4,4	0,1	9,8	0,3	0,0	1,8
Animal, vegetable oil	40	0,0	0,1	0,0	0,0	0,2	0,1	0,2	0,3	0,0	0,2
Chemicals	50	0,0	0,2	0,2	0,7	0,1	0,1	8,0	0,8	1,8	2,5
Basic manufactures	60	11,5	**73,3**	4,6	8,4	5,1	1,9	**39,0**	5,3	**42,7**	20,2
Machines, transport equipment	70	0,2	0,2	0,7	0,9	4,9	1,9	17,3	5,8	1,4	2,2
mis. Manufactured goods	80	0,1	0,1	8,9	**64,7**	4,2	4,6	4,7	3,1	0,2	6,4
Goods not classified by kind	90	6,8	6,5	0,1	0,6	9,0	0,4	0,7	0,6	37,4	0,1

Source: Author's calculation. Based on World Trade Analyzer data.

The analysis of Revealed Comparative Advantage and complementarity indices might give us a further insight to assess the extent of complementarity opportunities among SADC countries. This is developed in the following section.

3.2 Revealed Comparative Advantage and Complementarity Indices

Another way of evaluating present intra SADC trade flows and the potential complementarity of its member countries is to look at indices of revealed comparative advantages. In the context of regional arrangements, the presumption is that country groupings that have a narrower range of RCA indices (and in similar products) are

less likely to find grounds for sustained exporting as a result of a regional trade arrangement.

Different types of indicator have been used for measuring RCA. The early attempts to quantify RCA were based on export data. They compared the commodity structure of one country's exports to the export structure of a reference groups (for instance industrialized countries or the world). Lemoine and Freudenberg (1999) underline that these ratios were in fact indexes of 'export specialization' and failed to take into account imports while it has become more and more necessary to incorporate imports in the measure of comparative advantage. Indeed as the international division of labor intensified, imports have become an important factor for explaining export performance; intra industry trade has increased at an accelerated pace and it could be argued that comparative advantage is properly a net trade concept. This led to measure comparative advantages with indicators based on commodity trade balances.

Therefore, in the following, the method used to assess RCA is based on the indicator of "contributions to trade balance" (CTB) or "revealed comparative advantage" developed by Lafay (1990). The contribution to the trade balance is a structural indicator which tries to eliminate cyclical variations. Expressed in thousandth of GDP, this indicator is assessed by referring to a theoretical equilibrated trade balance, and by eliminating the impact of the variations of the products relative weights[16]. CTB compare observed trade balance for a product with a theoretical trade balance corresponding to the absence of specialisation.

If there were no comparative advantages or disadvantages, then a country's total trade balance (surplus or deficit) would be distributed across products according to their respective share (weight) in total trade. The indicator of contribution to trade balance thus compares the country's actual trade balance (or observed net trade) for a given commodity to the expected (theoretical) trade balance for this commodity.

The country's actual trade balance for product *i* is defined as :

$$X_i^k - M_i^k \qquad \textbf{(1)}$$

With *i* the country, *k* the product and *X* are the exports and *M* the imports.

And the theoretical trade balance:

$$\sum_k (X_i^k - M_i^k)\left[\frac{X_i^k + M_i^k}{\sum_k (X_i^k + M_i^k)}\right] \qquad \textbf{(2)}$$

Where the actual trade balance of the economy, $\sum_k (X_i^k - M_i^k)$, is weighted by the share of total trade of product k , $X_i^k + M_i^k$, in total trade of the economy as a whole,

[16] It means assuming that each commodity contributes to the overall trade balances in proportion of its weight in total trade.

$\sum_k (X_i^k + M_i^k)$. The overall trade deficit is thus distributed among products according to their respective share in total trade.

Finally subtracting (2) from (1) and normalising with respect to the country's GDP yields:

$$CTB_i^k = \left(\frac{1000}{Y_i}\right)\left[\left(X_i^k - M_i^k\right) - \sum_k \left(X_i^k - M_i^k\right)\left(\frac{X_i^k + M_i^k}{\sum_k \left(X_i^k + M_i^k\right)}\right)\right] \quad \textbf{(3)}$$

With *Y* the GDP.

The difference between the actual trade balance for a product and the 'theoretical' trade balance for the same product measures its specific contribution to the total trade balance. The contribution is positive when the actual trade surplus is larger than the expected trade surplus and also when the relative trade deficit is smaller than the expected trade deficit. The indicator highlights the relative strengths and weaknesses of individual sectors in the country's trade. The commodity contribution to the country's trade balances may be added and the sum is zero by definition. The indicators make it possible to compare the intensities of specialization across countries which are reflected in the scale of the commodity contribution to trade balance.

The range of comparative advantages allows grasping the differences among countries in their degree of specialization. The results for selected countries are displayed in **Table 10**.

According to our results the range of comparative advantages is less concentrated for South Africa compared to other SADC countries. South Africa main comparative advantages spread from minerals (coal, coke) and crude minerals, chemicals (inorganic chemicals) and basic manufactures (non-ferrous metals, iron and steel) to fresh food (vegetables…). As the majority of SADC countries, the main disadvantages lie in general industrial machinery and equipment, telecommunication and electrical machinery and to a lesser extent on road vehicles.
Partly as a consequence of its small size, Mauritius is among countries, which have less diversified comparative advantages (like Angola, DR Congo….). Globally, Mauritius has two main comparative advantages in sugar and sugar preparation and articles of apparel and clothing accessories. Mauritius and Malawi are the two countries among SADC countries having a comparative advantage in clothing. The main disadvantages are textile yarn and road vehicle. One can underline that while these countries have comparative advantages in clothing they have disadvantages in textile yarn or fibers. At the same time, countries like Zimbabwe or Mozambique have comparative advantages in textile fibers. This suggests that some complementarity might be developed in this field.

Table 10: Revealed Comparative Advantages for Selected SADC countries in 1999

	South Africa		Zimbabwe		Mauritius
Petroleum, petroleum products and related m	-10,9	Road vehicles (incl air cushion vehicles)	-37,7	textile yarn, fabrics, made upart, related p	-70,2
Telecommunications & sound recording apparels	-10,5	Machinery specialized for particular industries	-27,0	Road vehicles (incl air cushion vehicles)	-31,7
Office machines & automatic data processing	-8,1	General industrial machinery & equipment	-20,1	other transport equipment	-26,5
Electrical machinery, apparatus & appliance	-6,9	Electrical machinery, apparatus & appliance	-16,9	Petroleum, petroleum products and related m	-24,2
General Industrial machinery & equipment	-6,8	Special transactions & commod, not classified	-12,5	Machinery specialized for particular industries	-21,5
Miscellaneous manufactured articles, nes	-4,5	Chemical materials and products, nes	-12,1	Electrical machinery, apparatus & appliance	-14,2
Power generating machinery and equipment	-4,3	Telecommunications & sound recording apparels	-11,8	Telecommunications & sound recording apparels	-13,4
Medicinal and pharmaceutical products	-4,3	Artif. Resins, plastic mat., cellulose esters	-11,4	General industrial machinery & equipment	-12,5
Pulp and waste paper	2,5	crude animal and vegetable materials, nes	7,8	Metalliferous ores and metal scrap	0,6
Inorganic chemicals	3,2	coffee, tea, cocoa, spices, manufactures there	8,5	Fertilizers manufactured	0,6
Vegetables and fruits	6,7	non ferrous metals	12,3	Crude animal and vegetable materials, nes	1,0
Metalliferous ores and metal scrap	7,8	iron and steel	13,3	Animals, live nes incl zoo animals	2,4
Non metallic mineral manufactures, nes	8,9	crude fertilizers abd crude materials	13,4	Photographic apparatus, optical goods, watch	2,6
Coal, coke and briquettes	9,8	sugar, sugar preparations and honey	18,5	Fish, crustaceans, mollucs, preparations thereof	5,2
Iron and Steel	15,2	textiles fibres (except wool tops) and thei	20,2	sugar, sugar preparations and honey	90,4
Non ferrous metals	23,5	Tobacco and tobacco manufactures	117,6	Articles of apparel and clothing accessories	264,5

Source: Author's calculation. Results for remaining SADC countries are available on request.

The main comparative advantages of Zimbabwe rely in basic manufactures (iron and steel, cork and wood manufactures), tobacco, textile fibers and clothing. The main disadvantages of Zimbabwe are close to the one of South Africa.

On a more global level, SADC countries have comparative advantages in products they are well endowed in and which are quite similar. Moreover they have the same disadvantages in machines and road vehicle. This tends to suggest that complementarity, as a way to stimulate trade might be difficult among SADC countries.

Our results are in line with those of Yeats (1998) who found that RCAs for Africa tend to be concentrated in relatively few products and great similarity exists in the products in which the countries have high RCAs (reflecting their similar endowments). Indeed indices of RCAs show the range of processed products African countries export competitively is extremely narrow and may have a common comparative advantage in the same items (such sugar preparation or refined petroleum products). Moreover he stresses that most of the countries do not have a comparative advantage in the products (such as machinery and transport equipment) that are of primary importance in regional imports[17]. These considerations tend therefore to weakness prospect for any RTA[18].

[17] Nevertheless he found different results for SACU. According to him, among the products in which SACU has a RCA, there are non electric power machinery, metal working machinery, electric power

Along with comparative advantages indices, indices of complementarity may help also to show the extent to which SADC countries exports correspond to the other SADC's imports and thus how well the structure of exports corresponds to the imports needs. If the SADC countries export match the products other import, this should facilitate regional trade arrangements.

To evaluate distance between specialisation structures for each pair of countries we use a similarity indicator (Freudenberg and alii, 1998). Firstly we measure specialisation patterns with the "contributions to the trade balance" (CTB) or "revealed comparative advantage" (Lafay, 1990) as developed supra.

The intensity of specialisation is linked to the country's size. Small countries are much more specialised than big ones. To evaluate the closeness of specialisation for a particular pair of country we have to get rid of this size effect.

Thus, complementarity is calculated in two steps:

- We compute first adjusted *CTB* where the difference of specialisation is eliminated to make the structures comparable: *CTB* are multiplied by a coefficient ($CTB^{adj} = CTB * \frac{100}{\sum_{ctbj<0} |CTB_j|}$ if CTB < 0 and the same hold if CTB>0) so that the sum of adjusted values equals 100 for positive contributions and –100 for negative contributions. This allows gauging the relative importance of each strong contribution among the whole strong contributions and the same for negative contributions.

machinery, agricultural machinery, electrical distributing equipment and plastic and rubber manufactures. This suggests that SACU has developed an export capacity in a wide and diverse range of manufactures and processed products and thus that potential for two-way trade between South Africa and other SADC members might exist.

[18] According to certain a high level of intra-industry trade might also have a positive role on regional arrangements. But small base of intra industry trade exists within Africa. Perhaps one of the major reasons for the failure of this type of trade to develop is that many Sub Saharan African countries exports are highly concentrated in very similar primary products and their common characteristics preclude gains from their exchange. Geography and logistical problems may also play a role. The few African countries that appear to have established a fledgling industrial base that might support some intra industry trade (like Kenya and Zimbabwe) are relatively distant from each other and may face important transport, communications, financial and other constraints that work against this trade. In short, production sharing and intra industry trade can be an important factor promoting integration, but there is no evidence that it is occurring within Africa.

- For each pair of countries we add up absolute differences of CTB^{adjust} for products between two countries. If two countries had the same specialisation (possibly with different intensities) the value of CTB adjusted would be identical for each product and the cumulated difference equals to 0. Thus the similarity is 100. If, on the opposite, two countries have an opposite specialisation (a positive value for country A and a negative value for country B), the cumulated difference would be 400. And the similarity is 0. A last adjustment allow to restrict the indicator such as it varies between 100 (perfect similarity of specialisation) and zero (perfect complementarity).

$$Compl_{ij} : \frac{1}{4}\sum_{k}\left|CTB_{ik}^{adjust} - CTB_{jk}^{adjust}\right| \qquad (4)$$

(Similarity index is thus equal to 100 - $Compl_{ij}$).

Table 11: Bilateral complementarity indices for 1996

	South Africa	Angola	DRC	Malawi	Mauritius	Mozambique	Seychelles	Zimbabwe	Tanzania	Zambia	Average
South Africa	0.0	76.3	71.4	69.3	74.63	68.5	74.4	57.3	65.4	67.7	69,4
Angola	76.3	0.0	59.8	69.7	72.4	69.8	52.8	75.9	65.6	64.4	67,4
DR Congo	71.4	59.8	0.0	60.9	67.7	66.2	65.7	69.7	57.3	59.6	64,3
Malawi	69.3	69.7	60.9	0.0	64.4	68.1	70.3	36.2	48.5	59.7	60,8
Mauritius	74.6	72.4	67.7	64.4	0.0	74.9	70.4	73.0	70.6	72.7	71,2
Mozambique	68.5	69.8	66.2	68.1	74.9	0.0	47.9	72.4	53.8	72.8	66,1
Seychelles	74.4	52.8	65.7	70.3	70.4	47.9	0.0	78.1	67.9	72.0	66,6
Zimbabwe	57.3	75.9	69.7	36.2	73.0	72.4	78.1	0.0	56.6	63.2	64,7
Tanzania	65.4	65.6	57.3	48.5	70.6	53.8	67.9	56.6	0.00	48.9	59,4
Zambia	67.7	64.4	59.6	59.7	72.7	72.8	72.0	63.2	48.9	0.00	64,6
Average	69,4	67,4	64,3	60,8	71,2	66,1	66,6	64,7	59,4	64,6	65,5

Source : Author's calculation.

Table 12: Bilateral complementarity indices for 1998

	South Africa	Angola	DR Congo	Malawi	Mauritius	Mozambique	Seychelles	Zimbabwe	Tanzania	Zambia	Average
South Africa	0,0	72,6	64,4	73,2	75,0	67,3	71,6	59,3	64,7	68,4	68,5
Angola	72,6	0,0	59,0	67,2	69,3	60,2	63,3	64,4	61,0	60,3	64,1
DR Congo	64,4	59,0	0,0	64,1	70,0	63,8	65,6	65,7	61,8	58,4	63,6
Malawi	73,2	67,2	64,1	0,0	61,0	62,3	70,3	45,9	46,8	59,8	61,2
Mauritius	75,0	69,3	70,0	61,0	0,0	68,7	69,7	70,7	68,9	71,4	69,4
Mozambique	67,3	60,2	63,8	62,3	68,7	0,0	50,4	55,0	44,0	60,2	59,1
Seychelles	71,6	63,3	65,6	70,3	69,7	50,4	0,0	70,5	63,0	68,4	65,9
Zimbabwe	59,3	64,4	65,7	45,9	70,7	55,0	70,5	0,0	51,7	45,3	58,7
Tanzania	64,7	61,0	61,8	46,8	68,9	44,0	63,0	51,7	0,0	63,4	58,4
Zambia	68,4	60,3	58,4	59,8	71,4	60,2	68,4	45,3	63,4	0,0	61,7
Average	68,5	64,1	63,6	61,2	69,4	59,1	65,9	58,7	58,4	61,7	63,1

Source : Author's calculation.

Between 1985 and 1998, the average complementarity between SADC countries remain stable.

Several results may be drawn from **table 11 and table 12**:

- In 1996, Malawi and Tanzania[19] have the least complementarity with SADC (on average) compared to Zimbabwe and Tanzania in 1998; at the same time South Africa and Mauritius have the highest in 1996 and 1998;

- In 1996, Malawi and Zimbabwe record the lowest level of bilateral complementarity, followed by Mozambique and Seychelles; Tanzania and Malawi; and Tanzania and Zambia; In 1998, the lowest level of bilateral complementarity is between Tanzania and Mozambique followed by Zimbabwe and Malawi and Zimbabwe and Zambia.

- In 1996, Zimbabwe and Seychelles tend also to have the highest level of bilateral complementarity, followed by South Africa and Angola; Zimbabwe and Angola; In 1998, South Africa records the highest level of bilateral complementarity with Mauritius and Malawi.

Several conclusions can be emphasized:

- Even though some complementarity might exist between SADC countries, this does not provide the necessary in-depth information for the existence of potential trade. Indeed, as seen previously, comparative advantages of SADC countries remain concentrated and in similar products. Moreover, SADC countries tend to have the same comparative disadvantages, especially in manufactured products. What our indicator regards as complementarity is in fact, to a large extend, dissimilarity in the sets of export goods. Natural trade partners for primary goods producers are industrialized countries and the scope for trade within SADC is limited. Only South Africa and to a lesser extend Zimbabwe can provide adequate manufactured products. And even in this field, the range of products remains limited. No competitive supply can be found within the region for numerous branches (motor vehicles for instance).

- Moreover, large exports from South Africa suggest that existing opportunities may have already been exploited. Even though South Africa could increase its imports of certain products such as textile and clothing, tobacco and foodstuffs, the potential trade remains low for now, given the present economic structures of SADC countries.

- Another point to be made is that South Africa is currently not in a position to play the role of a driver vis-à-vis SADC like the European Union does for Maghreb countries. Indeed, comparative advantages of South Africa in manufacturing correspond to those of a country at its earlier stage of industrialization which suggests that the country can not be at the downstream of the labor division at a regional level. Moreover, South Africa and the other SADC countries tend to have comparative advantages in similar products. This means that it is difficult for the SADC countries to see South Africa as an important outlet for their exports (for example, mining or food can hardly be competitively exported to South Africa by SADC partners). However one can imagine that intra trade could expand

[19] For indication, the economic activity of Malawi, Tanzania and Mozambique is driven by the agricultural sector. The pillar of the economies of Zambia and DR Congo is the mining sector. Seychelles relies more on Tourism. Analysis on Angola is more difficult as the country is facing war and political problems for quite long time.

especially in vertically differentiated goods: for instance South-Africa could specialize in high quality food products, while importing from regional partners for middle and low range. On this issue, Robertson (2002) presents a sectoral analysis of trade for SADC countries which indicates that an orientation of trade policy around intra industry is likely to have large trade creation effects. According to him: *"The SACU markets are considered less accessible because of their common external tariff. However the potential for SACU to source products from the rest of SADC instead of the rest of the world is thought to be very high. Most of the SACU imports are confined to a few important sectors in which non SACU SADC countries have a comparative advantages (foodstuffs, clothing…). This indicates strong potential for intra- industry trade to develop from the FTA, both vertically and horizontally*". In the same vein, a research undertook by Visser (2001) shows that the level of intra-industry trade and cross-border trade along value added supply chains in specific categories (such as textiles) are also higher than might be expected in the SADC region.

Nonetheless, "Revealed" complementarity might be biased and thus underestimate potential trade insofar as trade restrictions for certain goods are existing, especially on 'sensitive' goods. As mentioned in section **1.3.**, these goods might nevertheless be source of complementarity among SADC countries.

3.1 SADC Trade Potential: A Gravity Approach

Gravity models are commonly used as an analytical framework in empirical studies of bilateral trade flows. They might be used not only to analyze trade patterns but also to address the issue of regionalism. Indeed, such an exercise can be done in order to simulate trade potentials corresponding to any regional integration scheme between any grouping of countries. In this respect, we thus estimate trade flows from 30 exporting countries (emerging countries among which 19 African countries) to 50 importing countries (encompassing both emerging and industrialized countries).

The first equation[20] (**model 0**) to be estimated in cross section in 1996 is in the following form:

$$Log\ X_{ij} = c + a_1 logGDP_j + a_2 log\ GDP_i + a_3 logPop_i + a_4 logPop_j + a_5 log\ DIST_{ij} + a_6 CB + \hat{\imath}_{ij} \quad (1)$$

With Xij the total exports of country *i* to country *j*; *GDP* is nominal income in country *i* and *j*; *Popi* and *Popj* are population in the two countries; *DISTij* is the geographic distance between country *i* and country *j*; *CB* is a dummy for Common Border which takes the value of 1 if there is a common border between country *i* and *j* and 0 otherwise.

We expect trade between *i* and *j* to be positively affected by output (*GDP*); negatively related to the level of population, indicating that larger countries tend to be more self

[20] Data sources : GDP and Population data are from the World Development Indicators from the World Bank, Distance is provided by CEPII database, and exports from the International Trade Statistics from the IMF (except for SADC countries, the data are from the SADC secretariat).

sufficient or, alternatively that poorer countries (countries with larger populations for a given level of *GDP*) trade less than richer countries; and negatively related to distance. As the existence of a common border usually facilitates trade, we expect the elasticity of *CB* to be also positive. The results are displayed in **Table 12**.

In **model 0**, the elasticity for the distance, while with the appropriate sign, is quite important. This might be due to the inclusion in our sample of both emerging and industrialized countries[21], or as we will discuss below to the problem of using geographic distance as a proxy for transport costs. The elasticities of GDP of country *i* and country *j* are positive and a bit higher than the usual results of the impact of national income on exports (around unity). The elasticities of Population are also significant with the right signs. The effect of the dummy common border[22] is quite important. As we show below, the inclusion in our sample of African countries has increased the common border effect. Indeed intra African trade tends to be highly concentrated geographically due to infrastructure and institutional constraints.

The high elasticities obtained for the distance and GDP variables lead us to introduce a remoteness variable[23] (**model 1**). The *Remoteness*[24] is a GDP weighted average of bilateral distances for each exporting country. Such a procedure improves the fit of the model with an R^2 adjusted amounting to 0.68. The remoteness is significant and positive which means that 'isolated' countries do not trade less on average: it's the relative distance that counts. Nevertheless the coefficient of distance while decreasing remains high and errors are still important. In **model 2**, *PTA*, a dummy for Preferential Trade Agreement, which takes the value of 1 if there is trade agreement between country *i* and *j*, and 0 otherwise, has been introduced. And in **model 3**, fixed effects for exporting countries have been added. In addition in **model 2 and 3**, we have considered a weighted OLS method (with weights being fitted value from Model 1) instead of a simple OLS[25]. With such a procedure, both PTA and fixed effects are

[21] Indeed on a reduced sample where the partner countries include only OECD countries the elasticity for distance equals 0.55.
Moreover, the inclusion in our sample of African countries and thus of intra African trade might also impact this result. Indeed as underlines by Yeats (1998) the existence of infrastructure and institutional constraints my limit expanded trade opportunities and influence the geographic pattern of trade. This is particularly relevant for intra-Africa's trade where as noted by Yeats also, cross border trade generally accounts for a high share of intra Africa's exports.

[22] The issue of common border has been highly discussed by Helliwell (1995, 1997).

[23] Refer to Freudenberg, Gaulier, Unal-Kesenci (1998).

[24] $Remoteness_i = \sum_j \left[GDP_j \times Dist_{ij} / \left(\sum GDP_k \right) \right] with k \neq i$

[25] One point has to be stressed : low or zero values observations for bilateral trade flows pose problems for the estimation of a gravity equation. Indeed, with a standard OLS estimation, prediction errors (in level) have a decreasing trend with the size of flows, i.e. residuals tend to be positive for small flows and negative for bigger ones. To accommodate for the numerous very large negative logarithm values for flows between small and remote countries (we replace null flows with 0.01million USD), OLS estimator gives very large elasticities to GDP and distance. As a consequence (OLS implies minimizing sum of residuals) fitted values for close and big countries are superior to actual numbers. Given the high variability of residuals (it is usual to get a factor of 10 between actual and predicted flows) positive relative errors for close and big countries translate into huge negative level error (actual flows minus predicted flows, in USD). For instance actual exports from Argentina to Uruguay is USD 726M compared to more than USD 150 MM predicted by **Model 1**. Even if OLS estimator with logarithm is not supposed to minimize level error but relative errors, we believe that too big level errors are evidence of misspecification.

significant. The coefficients of the other variables are also more in lines with the usual elasticities obtained for such variables.

Table 13: Results for several estimations

	0	1	2	3	4
C	-7,76 (-6.39)	-39.93 (-10.47)	-41.76 (-13.04)	-19.22 (-4.63)	-41.03 (-12.97)
LGDPi	1,53 (23.50)	1,22 (22.56)	1.00 (22.02)	1.48 (4.06)	1.08 (23.23)
LGDPj	1,46 (32.14)	1,23 (33.7)	1.01 (28.18)	1.03 (31.21)	1.08 (28.95)
LPOPi	-0,14 (-2.18)	0.04 (0.79)	0.11 (2.11)	1.76 (4.06)	0.07 (1.23)
LPOPj	-0,16 (-2.43)	-0,13 (-2.64)	-0.02 (-0.42)	-0.044 (-1.06)	-0.04 (-0.89)
CB	1,45 (3.36)	1,06 (3.31)	0.79 (3.07)	1.12 (4.7)	0.41 (1.35)
LDIST	-2,57 (-16.05)	-2,17 (-18.17)	-0.96 (-8.31)	-0.94 (-8.39)	-1.01 (-8.88)
Remoteness		3.76 (8.88)	3.27 (8.75)		3.07 (8.29)
PTA			1.39 (4.96)	1.38 (5.2)	1.12 (3.77)
LdistAfrica					0.12 (2.9)
CB AFrica					1.00 (2.53)
Fixed Effects				By exporting countries Globally significant (Pvalue < 0.001)	
No. of Observations	1471	1471	1471	1471	1471
R^2 Adjusted	0.63	0.68	0.65	0.71	0.66
Method of Estimation	OLS	OLS	Weighted OLS Weight = fitted value of model 1	Weighted OLS Weight = fitted value of model 1	Weighted OLS Weight = fitted value of model 1

Source: Author's calculation. Student statistics in brackets.

Our primary focus was to compare observed and predicted flows so as to assess trade potentials. Nevertheless, whatever the models, our results suggest that SADC trade potentials are rather small or negative[26], especially for South African exports (**See Table 14**, below). In one sense, our conclusions are not dissimilar from some previous studies. Thus, Coe & Hoffmaister (1998) find that the average African

One way to address the issue of nil flows might be through using Logit/Tobit procedures. Here, we have assessed ***weighted regressions*** which reduce the importance of low flows in the estimation of the equation. We first assess a standard OLS (**Model 1**) and then we use the predicted (logarithm) flows as weighting in the final regression (**Models 2, 3 and 4**). In this manner trade flows between Mexico and the USA for example will have more influence in the estimation than the one between Lesotho and Swaziland. Such a procedure allows to correct for the decreasing trend of level errors with the size of flows. The variables' elasticities are affected: coefficients of income and population tend to decrease, the latest sometimes loosing their significance; the elasticities for GDP decrease to unity, that is theoretically consistent values; the elasticity of distance is also reduced to reach values usually found for this variable, i.e. around unity.

[26] Predicted trade flows are available from the authors upon request.

country tends to "overtrade" compared with developing countries in other regions. In the same vein, one of the main conclusions of Subramanian and Tamirisa (2001) is that Anglophone Africa traded more with itself than an average country, while its trade with the South and with the non-Lomé industrial country partners was typical.

Cassim (2001) used a cross section econometric gravity model to look at the potential for trade among SADC countries. According to his results, specific areas where potential trade is less than actual trade are mostly South African and Zimbabwean exports to the region. As he underlines: *"In the case of South Africa, in all instances, its potential exports are significantly lower than its actual exports. This is very interesting in the sense that trade patterns are currently skewed in favour of South Africa*." Our results are in line with Cassim's results in the sense that we find that South Africa's actual exports are all above potential exports with other SADC countries. Nevertheless, even though other SADC country combinations show some potential trade higher than actual trade, they seem nevertheless smaller compared to Cassim's results.

Table 14: Actual and potential bilateral trade among selected SADC countries, millions US $

Export	Import	actual	predict	Diff	Export	Import	actual	predict	Diff
Angola	Angola				**South Africa**	Angola	345,01	75,49	-269,52
	Botswana	0,01	1,22	1,21		Botswana	1728,10	447,37	-1280,73
	DRCongo	0,01	19,10	19,09		DRCongo	219,24	47,82	-171,42
	Lesotho	0,01	0,17	0,16		Lesotho	868,61	90,19	-778,42
	Malawi	0,01	0,51	0,50		Malawi	219,95	23,26	-196,69
	Mauritius	0,01	0,52	0,51		Mauritius	214,39	32,26	-182,13
	Mozambique	0,01	0,51	0,50		Mozambique	553,57	179,46	-374,11
	Namibia	1,43	4,10	2,67		Namibia	1441,71	269,32	-1172,39
	Seychelles	0,01	0,06	0,05		Seychelles	37,62	2,96	-34,66
	South Africa	56,82	33,33	-23,49		South Africa			
	Swaziland	0,01	0,23	0,22		Swaziland	1058,35	86,12	-972,23
	Tanzania	0,01	1,15	1,14		Tanzania	128,93	48,73	-80,20
	Zambia	0,01	3,60	3,59		Zambia	414,38	37,78	-376,61
	Zimbabwe	0,01	2,10	2,09		Zimbabwe	1239,31	454,42	-784,90
Botswana	Angola	0,01	1,58	1,57	**Tanzania**	Angola	0,56	1,52	0,96
	Botswana					Botswana	1,40	1,19	-0,21
	DRCongo	0,01	1,02	1,01		DRCongo	4,07	4,82	0,75
	Lesotho	0,20	0,61	0,41		Lesotho	0,01	0,17	0,16
	Malawi	4,60	0,67	-3,93		Malawi	2,23	4,75	2,52
	Mauritius	0,10	0,66	0,56		Mauritius	0,20	1,04	0,84
	Mozambique	0,40	1,56	1,16		Mozambique	0,30	2,73	2,43
	Namibia	4,30	6,08	1,78		Namibia	0,04	0,62	0,58
	Seychelles	0,01	0,06	0,05		Seychelles	0,01	0,15	0,14
	South Africa	585,60	256,34	-329,26		South Africa	5,02	28,32	23,30
	Swaziland	0,70	0,80	0,10		Swaziland	0,03	0,28	0,25
	Tanzania	0,50	1,17	0,67		Tanzania			
	Zambia	6,40	5,15	-1,25		Zambia	12,76	4,45	-8,31
	Zimbabwe	99,20	15,97	-83,24		Zimbabwe	2,09	3,15	1,06
Mauritius	Angola	0,01	0,77	0,76	**Zimbabwe**	Angola	7,04	3,03	-4,01
	Botswana	0,11	0,76	0,65		Botswana	84,18	17,76	-66,43
	DRCongo	0,01	0,56	0,55		DRCongo	6,32	2,10	-4,22
	Lesotho	0,54	0,13	-0,41		Lesotho	0,24	0,52	0,28
	Malawi	3,79	0,40	-3,39		Malawi	60,83	3,30	-57,53
	Mauritius					Mauritius	2,73	1,46	-1,28
	Mozambique	0,01	0,48	0,47		Mozambique	77,88	9,56	-68,32
	Namibia	0,00	0,37	0,37		Namibia	24,47	7,02	-17,45
	Seychelles	2,56	0,13	-2,43		Seychelles	4,49	0,15	-4,34
	South Africa	13,32	21,19	7,87		South Africa	312,34	289,57	-22,77
	Swaziland	0,01	0,20	0,19		Swaziland	2,14	0,97	-1,17
	Tanzania	4,68	1,18	-3,50		Tanzania	5,12	3,45	-1,67
	Zambia	0,17	0,47	0,30		Zambia	91,11	23,68	-67,44
	Zimbabwe	8,91	1,50	-7,41		Zimbabwe			

Source: Author's calculation based on equation (4). See **appendix 1** for the results for the other SADC countries.

The technical problems related to the results coming forth from the application of the gravity model lead us to believe that the gravity model might not be a sufficient and most suitable tool to assess trade potential for Africa.

One problem we face is related to the distance variable[27]. The use of geographic distance in kilometers may bias our results. In the gravity equation, distance (and common border) is supposed to proxy for transaction cost. However, especially when transport infrastructures are poor and physical obstacles important, geographical distance is a very crude proxy. Two examples illustrate this issue: the simulated trade between South Africa and Lesotho is quite inferior to the observed one due to the overestimation of distance between the two countries (983km). Lesotho being landlocked in South Africa, the relevant "distance" is much less. On the opposite, distance between Luanda and Kinshasa (530km) does not take into account that trade between two countries in war is difficult and thus our model is likely to overestimate trade between these countries. The fact that India is the first client to Tanzania may also be understandable given close historical links and shipment between Dar es Salaam and Bombay. Geographic distance is thus an inappropriate proxy of transport costs in our case[28]. In order to deal with the potential specificities of Africa regarding proximity we consider (**model 4**) allowing a distinct impact for both distance and common border variables. Two additional variables have thus been introduced: *DISTAfrica* is $dist_{ij}$ × Africa, where Africa is a dummy variable that takes the value of 1 for African countries and 0 otherwise; *CBAfrica* is *CB* × Africa. The results suggest that while the elasticity of distance is about -0.89 (-1.01+0.12) for Africa (which is relatively small), the coefficient for common border dummies for Africa reaches 1.41 (0.41+1). This implies that trade between neighbors countries is three times (exp(1.41)) higher than between countries that do not share common border. Distance, per se, seems not to be the main explanatory variable for African trade while the common border effect is more important.

Nonetheless **model 4** specifications do not improve significantly the sensitiveness of results (computed trade potentials remain dubious, even in the case of negative intra-SADC potentials). The question is thus to what extent our conclusion of negative potential trade among SADC countries might be relevant? While some procedures have allowed us to improve the fit of the model, problems related to errors in level remain. This suggests that certain characteristics of African countries are not taken into account in our specification and thus are gauged by the residuals. This might explain the existence of large systematic errors. Indeed, according to our results, Africa's trade does not seem to be properly explained by the usual and natural determinants of gravity equations. When using distance as a proxy for transaction

[27] Limao and Venables (2000) show that intra African trade is more responsive to distance (with an elasticity of –1.63 compared to –1.33 for non-SSA pair) due to poor infrastructure.

[28] A more precise treatment of distance, as in Head and Mayer (2000), might be useful. It would imply considering the breaking down of countries into regions and measuring between countries distances as weighted average distances between regions (rather than between capital distances). It would solve the measurement problem for landlocked countries (our first example) but not the issue of incomplete transport networks, which is of crucial concerns in Africa.

costs we ignore the specificities of transport network that result from history (transport facilities favoring trade with a former colonial country) or geography (deep forests, deserts). Such issue are particularly relevant in the case of SADC (and of Africa in general)[29] Gravity model also assumes a level of diversification of outlet and supplying too important for small countries and does not take into account of the composition of supply and demand between countries[30]. This issue might be important for African countries. Fundamentally, one should be cautious in using gravity model for emerging and developing countries. Those countries tend to have a highly sectoral and geographically concentrated distribution of exports (for example, a large share of Angola's exports is directed to the United States and consists of oil). Standard gravity equation (which considers homogenous trade models) may not be able to accommodate for such high specificities and "distortions".

It seems interesting to assess the countries relative degree of trade (exports) openness by using gravity model results. However we argued that gravity equation residuals are poor estimate of trade potential, at both bilateral and country level. Consequently we consider using information about variability of errors (in place of average). In Gaulier (2001) we make the assumption that obstacles to trade (tariff and non-tariff barriers) lead to distortions in the geographic spread of supplies[31]. Faced with markets protected by significant obstacles, only some suppliers will be able to bear the resultant costs, even if the obstacles are the same for everyone (i.e. there is no ex-ante discrimination). As a result, the greater the barriers, the more imports will be concentrated on a small number of trading partners and/or the more market shares will be distorted compared to a "natural" distribution of trade flows. In this paper we proxy "natural" trade with the forecast from the gravity equation. Gaulier (2001) address the question of openness to imports. In contrast, we measure here distortions in exports destinations. However distortions in exports and in imports tend to be positively correlated. The analysis of errors according to the method described above suggests that most SADC countries have a good degree of export openness. Angola is an exception but its dependence on oil exports may explain the high distortion it gets[32]. Low (corrected) distortion in South Africa and Zimbabwe suggest that their export potential is reduced.

All in all, according to our results, negative potentials for intra SADC are estimated. This might seem relevant for South Africa's exports that are quite high and lead to a very important surplus vis-à-vis the rest of SADC area as already seen in previous sections. However the prediction of a decrease of these flows is not credible. But, as we have already noticed an increase of South Africa (intra-SADC) imports might be considered. Also, results from the gravity equation[33] suggest that a deeper regional

[29] A proper treatment of transaction costs in Africa would require getting information on freight costs.
[30] To this respect, it might be interesting in a further research to introduce in our model a similarity variable that will gauge this effect.
[31] Leamer (1988) uses variance of residuals from a trade model as an openness measure.
[32] More generally countries with low level of diversification (and supply of homogeneous goods) tend to get high distortion. This is natural insofar as demand from their product is geographically concentrated (in industrialized countries). High distortions in Chile do not mean that this country is relatively closed.
[33] Large residuals for those flows. This includes, for instance, South Africa exports to United Kingdom or DR Congo exports to Belgium.

integration might reduce the trade flows existing due to former colonial relationship. This shift could be to the benefit of intra SADC trade.

4. CONCLUSION

The motivation of this paper was twofold:

Increasing integration of the world economies has revived interest in regional integration scheme. Africa which has been experimenting with economic integration for quite a long time is not left apart as can be seen through the number of economic blocs that has emerged in the continent. Nevertheless, as for now, progress on Africa regional integration has been slow and without significant result. The participation of South Africa, the largest and the richest country of the continent, has led to believe that it could provide the basis for successful and sustainable economic cooperation. The launch of the SADC FTA in September 2000 is intended to act as a catalyst for increase regional integration and to foster trade and investment flows within the region.

While regional trade liberalization is considered, by its proponents, as a mean to contribute to development through fostering economic growth, the debate on the link between trade liberalization and growth is still open among academicians and do not provide a clear cut answer. Therefore, we have focused our analysis on the prospects of trade in a regional context, the SADC community rather than to investigate the link between trade and development.

Several conclusions may be drawn from our analysis on SADC trade integration:

- While some complementarity might exist between SADC countries, this does not prove for existence of potential trade. Indeed, comparative advantages of SADC countries remain concentrated and in similar products. Moreover, they tend to have the same comparative disadvantages, especially in manufactured products. The complementarity indicator used in our study reflects, to a large extend, dissimilarity in the sets of export goods. Natural trade partners for primary goods producers are industrialized countries and the scope for trade within SADC seems limited. Only South Africa and to a lesser extend Zimbabwe can provide adequate manufactured products. And even in this field, the range of products remains limited. No competitive supply can be found within the region for numerous branches (motor vehicles for instance);

- Moreover, large exports from South Africa and the South Africa trade surplus vis-à-vis SADC region suggest that existing opportunities may have already been exploited. Even though South Africa might increase its imports of certain products such as textile and clothing, tobacco and foodstuffs, the potential trade remain low for now, given the present economic structures of SADC countries and the fact that some of these products are considered as 'sensitive' goods and are likely to be subject to a slower liberalization process;

- Another point to be highlighted is that given the basis of comparative advantages of South Africa (mostly in primary goods), it is not currently in a position to play the role of a driving force for the region. Moreover as the comparative advantages of the SADC countries are similar to that of South

Africa, it is difficult for the SADC countries to see South Africa as a large export market.

- However one can imagine that intra trade could expand especially in vertically differentiated goods: for instance South-Africa could specialize in high quality food products, while importing from regional partners for middle and low range of quality. In this respect, several studies suggest that the development of intra-industry trade and vertical integration of supply chains within the region would benefit the regional integration process;

- All in all, an increase of trade among SADC countries will imply either an openness of South African market, a changing of specialization of SADC countries or a reduction of protection on sensitive goods;

- Second, the use of gravity equation to simulate trade potentials for SADC countries raise several issues. According to our results, gravity models does not seem to be perfectly suitable to explain Africa trade. The use of geographic distance as a proxy of transport cost seems particularly problematic. This tend to suggest that one of the main problem of African trade does not only result from lack of diversification of comparative advantages but also from transport infrastructure network. More generally, improvement in infrastructure may be a prerequisite for successful trade integration and growth.

Even though regional integration might be seen as a tool to increase the power of negotiation vis-à-vis other trading blocs, it is important that SADC countries give weight to their national industrial development strategy which can be complementary to the regional initiative. Indeed, regional trade integration by itself is not a sufficient tool to contribute to economic development. In this respect and as an example, the improvement in infrastructure may be a prerequisite for successful trade integration and growth.

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APPENDIX

Table A1: Actual and potential bilateral trade among SADC countries, millions US $

Export	Import	actual	predict	Diff	Export	Import	actual	predict	Diff
DRCongo	Angola	0,01	19,78	19,77	**Namibia**	Angola	0,01	4,82	4,81
	Botswana	0,01	0,81	0,80		Botswana	6,00	5,51	-0,49
	DRCongo					DRCongo	0,01	0,68	0,67
	Lesotho	0,01	0,11	0,10		Lesotho	0,01	0,16	0,15
	Malawi	0,01	1,58	1,57		Malawi	2,21	0,28	-1,93
	Mauritius	0,01	0,39	0,38		Mauritius	0,01	0,30	0,29
	Mozambique	0,01	0,35	0,34		Mozambique	0,35	0,41	0,06
	Namibia	0,01	0,60	0,59		Namibia			
	Seychelles	0,01	0,05	0,04		Seychelles	0,01	0,03	0,02
	South Africa	114,79	21,86	-92,93		South Africa	256,68	139,84	-116,84
	Swaziland	0,01	0,16	0,15		Swaziland	0,07	0,19	0,12
	Tanzania	0,53	3,79	3,26		Tanzania	0,01	0,55	0,54
	Zambia	10,90	2,59	-8,31		Zambia	6,03	2,20	-3,83
	Zimbabwe	0,21	1,51	1,30		Zimbabwe	11,05	5,72	-5,33
Lesotho	Angola	0,01	0,25	0,24	**Seychelles**	Angola	0,01	0,05	0,04
	Botswana	0,30	0,70	0,40		Botswana	0,01	0,04	0,03
	DRCongo	0,01	0,16	0,15		DRCongo	0,01	0,03	0,02
	Lesotho					Lesotho	0,01	0,01	0,00
	Malawi	1,45	0,10	-1,35		Malawi	0,01	0,02	0,01
	Mauritius	0,01	0,13	0,12		Mauritius	0,40	0,07	-0,34
	Mozambique	0,01	0,32	0,31		Mozambique	0,01	0,02	0,01
	Namibia	0,00	0,20	0,20		Namibia	0,40	0,02	-0,38
	Seychelles	0,01	0,01	0,00		Seychelles			
	South Africa	67,52	59,04	-8,48		South Africa	1,01	1,00	-0,01
	Swaziland	0,11	0,17	0,06		Swaziland	0,01	0,01	0,00
	Tanzania	0,01	0,20	0,19		Tanzania	0,01	0,09	0,08
	Zambia	0,07	0,17	0,10		Zambia	0,01	0,03	0,02
	Zimbabwe	0,06	0,54	0,48		Zimbabwe	0,01	0,08	0,07
Malawi	Angola	0,01	0,67	0,66	**Swaziland**	Angola	0,03	0,30	0,27
	Botswana	0,65	0,68	0,03		Botswana	1,60	0,82	-0,78
	DRCongo	0,58	0,49	-0,09		DRCongo	0,01	0,20	0,19
	Lesotho	0,53	0,09	-0,44		Lesotho	0,49	0,16	-0,33
	Malawi					Malawi	8,80	0,16	-8,64
	Mauritius	5,01	0,35	-4,66		Mauritius	3,20	0,18	-3,02
	Mozambique	9,43	1,56	-7,87		Mozambique	43,60	6,11	-37,49
	Namibia	0,01	0,32	0,31		Namibia	1,90	0,22	-1,68
	Seychelles	0,06	0,04	-0,02		Seychelles	0,01	0,02	0,01
	South Africa	68,03	13,53	-54,50		South Africa	584,90	50,40	-534,50
	Swaziland	0,01	0,16	0,15		Swaziland			
	Tanzania	5,80	4,75	-1,05		Tanzania	8,31	0,28	-8,03
	Zambia	8,97	3,73	-5,24		Zambia	7,00	0,25	-6,75
	Zimbabwe	21,59	3,01	-18,58		Zimbabwe	9,70	0,89	-8,81
Mozambique	Angola	0,47	0,92	0,45	**Zambia**	Angola	0,61	4,69	4,08
	Botswana	0,01	2,17	2,16		Botswana	4,90	5,17	0,27
	DRCongo	0,13	0,62	0,49		DRCongo	41,31	3,25	-38,06
	Lesotho	0,01	0,38	0,37		Lesotho	0,01	0,15	0,14
	Malawi	1,39	2,14	0,75		Malawi	10,77	3,69	-7,08
	Mauritius	0,01	0,58	0,57		Mauritius	0,01	0,42	0,41
	Mozambique					Mozambique	6,16	2,32	-3,84
	Namibia	0,01	0,63	0,62		Namibia	4,26	2,44	-1,82
	Seychelles	0,01	0,05	0,04		Seychelles	0,01	0,04	0,03
	South Africa	43,91	142,90	98,99		South Africa	43,48	21,72	-21,76
	Swaziland	0,01	8,31	8,30		Swaziland	0,91	0,24	-0,67
	Tanzania	3,96	3,74	-0,22		Tanzania	11,53	4,40	-7,13
	Zambia	0,11	3,21	3,10		Zambia			
	Zimbabwe	9,83	11,94	2,11		Zimbabwe	52,73	21,36	-31,37

Source: Author's calculation.