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The Potential for Intra-Africa Trade and The Supply and Demand Constraints for its Realization

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1. Introduction: Intra-Africa Trade (IAT) and Regional Economic Communities (RECs)

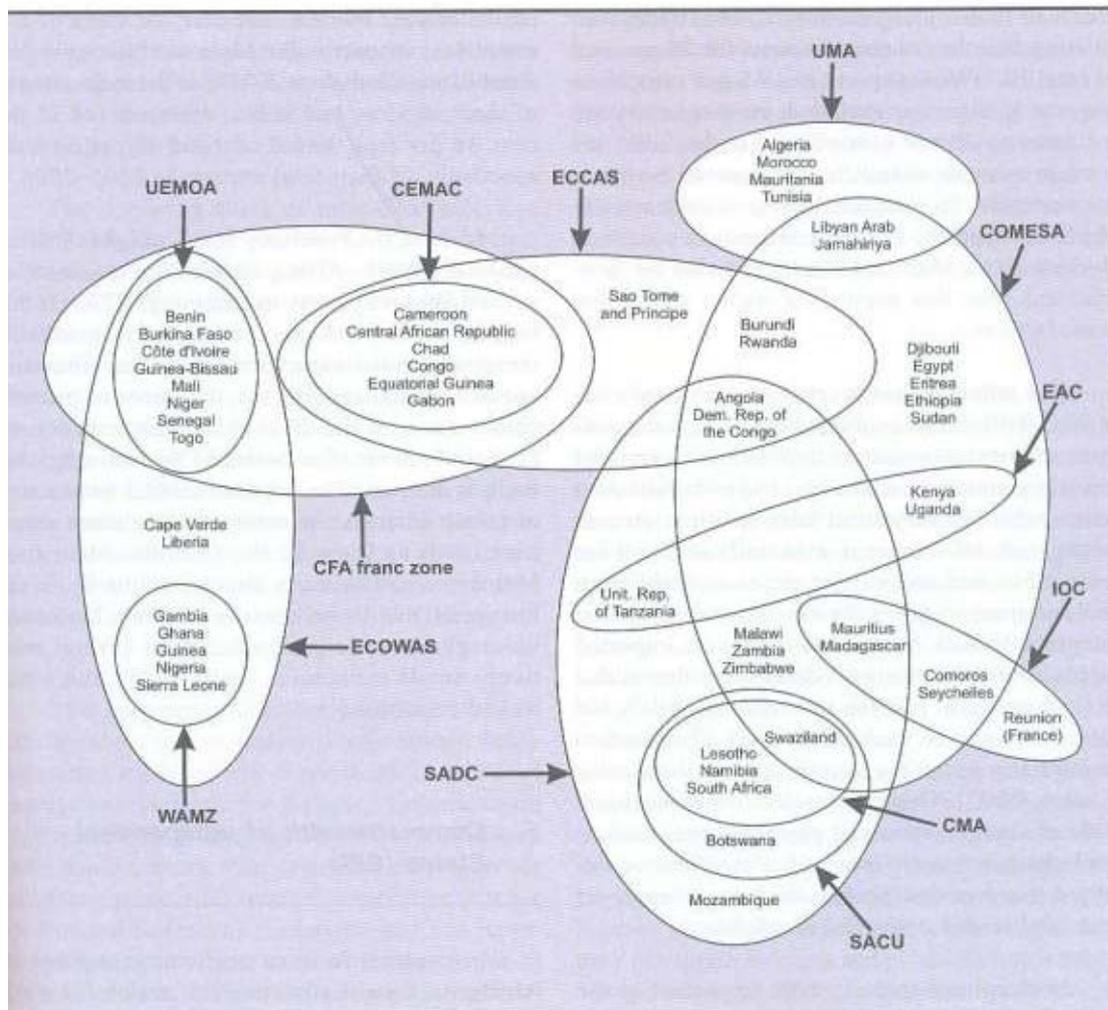
This Chapter deals with the issue of the potential for intra-Africa trade and the major challenges to realize that potential. The chapter also deals with the role of regional integration in this process. The latter is generally taken as one of the most important vehicles to enhance intra-Africa trade which itself is believed to lead to the betterment of the population in the continent. Although the issue of intra-Africa trade multifaceted the focus the challenge of this trade both from supply and demand side.

There are a number of regional economic communities in Africa. Each African country is a member of at least one economic community. In addition to politically motivated groupings, this proliferation of RECs partly indicates that the issue of regional integration is very crucial for African countries (Alemayehu and Haile, 2008)¹. This in turn is not surprising given that about 40 percent of the population and one-third of the economies in the continents are trapped in landlocked countries whose trade and development depend almost entirely on events that happen beyond their own borders. In addition, most countries in Africa are small in size and hence their economic feasibility is highly limited. It is obvious from the current pattern of RECs that the continent has this “*spaghetti bowl*” of regional economic communities (see Figure 1 below) whose missions overlap, and for the most part, are yet to achieve the most important objectives they were set up to accomplish- enhancing economic integration and uplifting the living standard of their population. On major instrument in this regard is intra-Africa trade. Although African share of world trade is less than two percent, that little trade constitutes more than half the GDP of each African country and hence its importance. Intra Africa trade has the potential to raise the level of welfare of the African population through fostering regional economic development (see Longo and Sekkat, 2001).

RECs do have the potential to contribute to the growth of intra-regional trade, could enhance the bargaining power in trade negotiations, and help ensure more policy credibility. Their welfare effect, if managed carefully, is unequivocally positive. Regionalism coupled with good policies (sound macroeconomic management, lower political tensions, and better physical infrastructure) could, hence, may lead to welfare gains. In sum, on top of pure economic arguments for African RECs, their interplay with politics and policies may turn integration into an efficient solution to intra-Africa trade and related developmental endeavors (see Longo and Sekkat, 2001; Alemayehu and Haile, 2008). According to World Bank (2000), however, contrary to the above optimism, South-South RECs were found to be quite problematic. On theoretical grounds, Venables (1999) argues that South-South regional integration schemes are likely to lead to income divergence between member countries. This doesn't however override the theoretical welfare gain of such schemes as established by the theoretical works of Kemp and Wan (1987), and Kemp (1964).

¹ These include the West African Economic Community (CEAO), Community for East and Southern African states (COMESA), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), the Central African Customs and Economic Union (EDEAC), the African and Malagasy Common Organization (OCAM), the Comite Permanent Consultatif du Maghreb (CPCM), the Economic Community of the Great Lakes Countries (CEPGL), and one may add the South African Customs Union (SACU).

AFRICA: OVERLAPPING MEMBERSHIP IN REGIONAL INTEGRATION GROUPS



Source: UNCTAD (2007): 'Trade and Development Report: Regional Cooperation for Development.

The African continent has been trading with the outside world (mostly the developed world) in large volumes since the turn of the 20th century (see Alemayehu 2002); however formal intra-Africa trade has remained at a very low level compared to the continent's trade with the outside world, constituting not more than 10 percent of total annual trade of each REC on the average (see Oramah and Abou-Lehaf, 1998; Alemayehu and Haile, 2008). The pattern of African exports continues to be strongly influenced by the continent's historical links with the outside world. Over 80 per cent of exports are still destined for markets outside Africa, with the European Union and the United States of America accounting for over 50 per cent of this total. Disaggregating African trade shows that none of the RECs has been successful in elevating intra-REC trade beyond a small portion of total African trade (see Table 1). As Table 1 shows the level of intra Africa trade is very low even though it shows some improvement lately. It was only 2.72 percent in the year 2000; but it increased to 4.31 percent in 2006. Table 2 further shows that African REC's do not supply more than 10 % of their exports or imports to the African market, the rest being directed to Europe, North America and Asia.

Table 1: The Level of Intra African Trade and Total African Trade for the years 2000-2006

	2000	2001	2002	2003	2004	2005	2006
Bilateral Trade among African Countries (in Tr.) [1]	16.4	16.3	18.4	21.8	27.6	32.6	46.7
GDP of the Trading African Countries (in Tr.) [2]	603	579	577	691	822	965	1,080
Bilateral Trade/GDP ([1]/[2])	2.72%	2.82%	3.20%	3.16%	3.35%	3.38%	4.31%

Source: compiled from UN COMTRADE (Accessed Jan, 2009).

Table 2 African RECs and Intra-Africa Trade (% of the RECs total Exports)

RECs	INTRA REC		REST OF AFRICA (ROA)		ASIA (Including China)		EUROPEAN UNION (EU)		JAPAN		USA		REST OF THE WORLD (ROW)	
	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.	Exp.	Imp.
CEMAC	0.9	5.2	2.7	8.9	23.1	6.9	36.1	52.4	0.8	1.9	28.9	13.1	7.4	11.6
CENSAD	12.2	13.0	4.5	6.4	18.9	16.4	35.5	39.1	1.9	2.7	8.7	4.9	18.3	17.5
CEPGL	2.7	1.6	4.7	35.5	17.6	8.3	39.8	33.5	6.0	2.4	7.0	4.1	22.2	14.7
COMESA	8.7	11.1	8.6	17.2	12.6	16.8	41.5	26.3	3.0	3.1	8.1	4.7	17.5	20.8
EAC	12.6	18.7	7.2	9.9	17.3	15.2	30.4	24.5	2.0	4.5	3.7	4.8	26.8	22.5
ECCCAS	0.7	3.8	2.2	14.0	18.8	9.1	42.5	50.6	0.8	2.1	23.6	10.7	11.5	9.7
ECOWAS	13.9	15.8	5.5	5.2	20.7	17.3	40.4	40.7	1.7	2.9	7.3	4.3	10.0	13.7
IGAD	21.5	15.2	5.8	3.6	18.0	21.9	19.9	19.7	3.9	3.7	2.8	5.0	28.2	30.9
IOC	3.0	3.6	1.8	15.1	7.3	21.4	63.8	32.9	3.4	2.8	16.6	3.0	4.1	21.1
MRU	0.4	1.3	3.9	9.4	7.8	25.2	68.7	38.7	0.2	7.3	6.5	4.5	12.4	13.6
SADC	19.9	33.1	2.3	2.6	12.2	14.2	40.7	25.2	4.3	2.9	9.4	5.4	11.2	16.7

UEMOA	11.5	14.9	18.6	13.7	30.8	12.9	25.2	40.3	2.0	1.8	3.0	3.0	9.0	13.3
UMA	2.5	3.1	4.5	1.7	3.0	9.0	70.4	60.3	2.8	2.4	5.1	3.9	13.1	19.6
Average	8.5	10.8	5.6	11.0	16.0	15.0	42.7	37.2	2.5	3.1	10.1	5.5	14.8	17.4

Source: ECA, compiled from IMF DOT 2006.

Given the unsatisfactory performance of the African RECs to date, the question of ‘is there a potential for intra-Africa trade?’ and ‘what are the major constraints to intra-Africa trade?’ is timely and important. The rest of this chapter is set to address these issues. The rest of the chapter is organized as follows. The next section, section two, will address the question of ‘is there a potential for intra-Africa trade?’. Once the potential intra-Africa trade across countries and potential African suppliers for African markets are identified, the relative comparative advantage of these countries is examined to further investigate the challenge of realizing the identified potential. This is done by examining the structure of demand and supply of African exports as well as the comparative advantage of African countries in export supply. This is followed by section four where the major constraints to supply are examined in detail with the aim of coming up with policy direction for enhancing intra-Africa trade. Section five concludes the chapter.

2. Is there a Potential for Intra Africa Trade?: A Gravity Model Approach

The potential for intra-Africa trade and the role of RECs in that process is a contested issue. It is argued that in spite of the proliferation of regional economic communities, it has not shown success in expanding intra-regional trade; and most of these regional economic communities have achieved very little (Ndulo, 1992; Foroutan and Pritchett, 1993; Alemayehu and Hail, 2008). Intra-Africa trade, for instance, in the Arab Maghreb Union (UMA), the Economic and Monetary Community of Central Africa (CEMAC) and the Common Market for Eastern and Southern Africa (COMESA) constitutes not more than 5 to 10 per cent of their total trade of each REC.

A number of studies have been carried out to assess the potential and performance of regional economic communities in Africa using the popular gravity model. Though the results of these studies slightly vary, the general findings and conclusion seem to be similar. They all conclude that the experience of regional integration in Africa has been disappointing in achieving one of its main objectives of increasing intra-regional trade and fostering policy coordination (see Alemayehu and Haile, 2008; Longo and Sekkat, 2000; Yeats, 1999; Lyakurwa *et al.* 1993; OECD, 1993; Foroutan and Pritchett, 1993; Elbadawi 1997; Lyakurwa 1997; World Bank, 1989). Notwithstanding some positive development in some of the African RECs, the weak intra-regional trade flows and the lack of progress over time - despite the multitude of treaties to that effect - do warrant further exploration. Should the weak performance of regional integration in Africa be attributed solely to lack of implementation? Or should it be attributed to some attendant characteristics of African economies, which led Foroutan and Pritchett (1993) to conclude that even in the absence of trade restrictions, the scope for trade among African countries is ‘intrinsically’

modest? This in simple term means *there is no potential for intra-Africa trade*. If so, does this suggest the need for a new approach to regional integration? More importantly what are the major factors behind such poor performance? Thus, the findings in the Africa literature leads to two important questions: first, is there a potential for intra-Africa trade after all? And second, if there is one, what are the major constraints that held African countries from exploiting this potential? If there is none, what are the reasons?.

According to UNCTAD (2005), intra-regional trade in UMA, for instance, is particularly low, despite the relatively diversified manufactured exports of some of its members (eg; Morocco and Tunisia), compared to the rest of the RECs in Africa. In 2005, Western Europe accounted for two thirds of total UMA exports: not only most of the fuel exports (mainly from Algeria and Libya) went to that market, but also 80 per cent of the manufactures exported by Morocco and Tunisia followed suit (see UNCTAD, 2005).

Cassim (2001) has also examined the determinants of intra-regional trade in Southern African countries using gravity model. What his gravity model suggests is that a programme of intra-regional trade liberalization could engender further trade potential. This, however, depends not only on tariff liberalization but also on overall reduction in trade costs. In Cassim's study trade in Southern Africa decreases from US\$2314 million of actual value to US\$775 million of estimation from gravity model. This represents a reduction in trade of over 50 percent, but increases significantly for non-SACU SADC countries' exports to South Africa (Cassim, 2001). This empirical result shows that intra-regional trade in SADC is not low by international standards. In fact it is actually beyond its potential. When compared to regions such as the Southern African Customs Union (SACU), the actual South African exports are higher than the estimated potential exports. However, the model indicates low trade volumes for other, especially none-SACU countries in the SADC region implying the existence of increasing scope for non-SACU countries to increase their exports to South Africa and vice versa.

In an earlier study Foroutan and Pritchett (1993) compared actual trade with what a traditional gravity model would predict. Employing the model for 19 Sub-Saharan countries, Foroutan and Pritchett (1993) predicted the level of intra-Africa trade that should occur based on their proximity to each other, the relative size of their economies and other economic characteristics. According to this study, the actual sub-Saharan African share of imports plus exports was an average (median) of 8.1 percent (4.5 percent) while the gravity model predicts a slightly lower, not higher, mean (median) of 7.5 percent (4.5 percent) implying that the actual intra-Africa trade is higher than expected.

In the light of mixed results from earlier studies, this chapter re-examined the issue using recent data (2000-2006) and wider coverage of African countries. The specification of the gravity model used, its expected signs, country coverage and the data used for its estimation are described in Appendix I. The estimated coefficients of this gravity model are used to simulate the potential for intra-Africa trade. The result of this exercise for two regions of Africa (West & Central Africa and East & Southern Africa) is briefly described below.

2.1 West and Central Africa

The gravity model specified in Appendix I is estimated using West and Central African countries as reporting countries and their major trading partners (both in Africa and the rest of the world). An attempt is made to cover all countries if the required data is available (see Appendix Ia for the sample of the countries used in estimating the model). The result of the gravity model is given as Table 3a below.

Table 3a: West & Central Africa: A Gravity Model 2000-2006

(Dependant variable is log of bilateral trade (West & Central Africa: Partners World))

	Tobit Equation	
	Coefficients	t-value
Ln (Area _j)	-0.25	-5.2 *
Ln(Area _i)	-0.07	-0.8
Ln(GDP _j)	0.69	11.2 *
Ln(GDP _i)	0.17	1.7 ***
Ln(Dist)	-0.73	-5.7 *
Ln (Mobile _i)	0.13	1.2
Ln(Road _i)	0.14	1.9 **
Land Locked	-0.62	-2.6 *
Border Share	1.17	2.7 *
Ln(FDI _i)	0.30	3.6 *
Ln(Dif_Percapita)	-0.21	-3.5 *
Ln(Taxe_Intnl _i)	-0.04	-1.8 **
Language_offical	0.37	2.2 *
Constant	-15.00	-7.7 *
Pseudo R-Square		0.0553
No of Observation		2382
Log Likelihood		-5563.02

*, **, *** Significant at 1, 5 and 10 % , respectively

The result shows that most of the traditional variables have the expected sign and are also statistically significant. As all variables, except the dummy variables, are in logarithms, the coefficients are elasticities. Infrastructure indicators used in the model are also found to have the expected positive sign (and in the case of share of paved road it is found to have statistically significant coefficient). Similar result is found for FDI. The difference in percapita income between West African countries and their trading partners is found to negatively affect bilateral trade as can be expected since it shows difference in pattern of demand (what is called 'the Linder effect'). It is also interesting to note that access to foreign market, whose proxy is tax on international trade by partner country, is found to negatively affect bilateral trade of West African countries.

Having the result in Table 3a, a simulation exercise is conducted to examine the potential or theoretical level of intra-Africa trade for each West African country given the parameters of the model reported in Table 3a. This is then compared with actual trade of each West African country to countries in the region (as the ratio of that country's total trade with all its major trading partners, both in West Africa and the rest of the world). The result of this exercise is given in Table 3b.

Table 3b: The Potential for Intra-Africa Trade in West and Central Africa

(Ratio of Actual to Potential ratio of regional exports to total exports, in Percent for each country)

	Exports of each Country to the 21 West and Central African countries (% of total Exports of that Country to all Countries in the Model)		
Exporting West & Central Africa Countries in the Model	Model Simulation (Potential, %) [A]	Actual (%) [B]	Actual to Potential Ratio (%) [A/B]
Benin	39.2	22.2	56.8
Burkina Faso	44.2	21.9	49.6
Cameroon	16.7	8.8	52.7
Cape Verde	9.4	0.3	3.5
Chad	21.3	0.7	3.1
Comoros	4.9	0.1	1.7
Congo	56.8	3.1	5.4
Congo (DRC)	60.0	1.5	2.5
Côte d'Ivoire	89.1	98.4	110.4
Gabon	23.3	1.9	8.0
Gambia	30.8	8.5	27.5
Ghana	37.5	10.2	27.2
Guinea	39.3	8.0	20.4
Guinea-Bissau	32.1	2.0	6.1
Liberia	26.2	1.8	6.7
Mali	43.4	6.6	15.1
Niger	34.3	30.7	89.5

Nigeria	26.2	8.6	32.9
Sao Tome and Principe	19.0	46.5	244.9
Senegal	7.2	1.2	16.9
Sierra Leone	18.5	4.3	23.0
Togo	46.7	67.4	144.3
Average (Simple)	33.0	16.1	43.1 (33.5*)
Average (Trade Weighted)			36.4

* Excluding Sao Tome and Principe

The result, as can be read from the last column of Table 3, shows that except for Sao Tome and Principe and Côte d'Ivoire, for most countries in the region their actual trade is well below the potential given by the gravity model which itself is the result of their proximity, level of income and related cultural affinities. On the average the countries in the region are trading only 43% (36.4 % using trade weighted average) of their potential trade in the region. The result also shows that there is variation in terms of potential across countries. Whereas some countries, such as Niger, are near their potential (90 percent) the majority are found to have actual trade well below the average actual to potential ratio.

2.2 East and Southern Africa

A similar gravity model, (as specified in Appendix I), to that of West and Central African countries is also estimated for East & Southern African countries. The result of this model is given as Table 4a.

Table 4a: East & Southern Africa: A Gravity Model 2000-2006

(Dependant variable is log of bilateral trade (East & Southern Africa: Partners World))

	Tobit Equation	
	Coefficients	t-value
Ln (Area_i)	-0.17	-3.3 *
Ln(Area _i)	0.15	1.0
Ln(GDP_i)	0.72	11.6 *
Ln(GDP _i)	0.37	2.5 *
Ln(Dist)	-0.98	-6.2 *
Ln (Mobile_i)	0.30	2.0 **
Ln(Road_i)	0.32	2.0 **
Land Locked	0.19	0.8
Border Share	1.50	3.0 *
Ln(FDI_i)	-0.22	-2.1 **
Ln(Dif_Percapita)	0.04	0.6
Ln(Taxe_Intnl_i)	-0.03	-1.2
Language_offical	0.25	1.4
Constant	-15.38	-5.8 *
Pseudo R-Square		0.0608
No of Observation		906
Log Likelihood		-2027.19

*, **, *** Significant at 1, 5 and 10 % , respectively

The result shows that most of the traditional variables have the expected sign and are also statistically significant. In addition, infrastructure indicators are found to have the expected sign which are statistical significant. The only unexpected sign is that for FDI which is negative (this may theoretically be plausible if the FDI in the region is market-seeking, as opposed to resource seeking type observed in West and Central African model). The difference in percapita income is not statistically significant for this region. Similarly access to foreign market, whose proxy is tax on international trade by partner country, and being landlocked are not found to be statistically significant, even though they have the right sign.

Having the result in Table 4a, similar simulation exercise to that of Table 3b is conducted. The result from the model is then compared with actual trade each country in the region. The result of this exercise is given in Table 4b. As can be read from the last column of Table 4b, the result shows that, except for Djibouti which is heavily trading with Ethiopia and Mauritius which is heavily trading with Madagascar and South Africa, for most countries in the region their actual trade is well below the potential given by the gravity model. On the average the countries in the region are trading about 75% (40 % using trade weighted average) of their potential trade in the region. This 75% percent would drop to about 49% if Mauritius and Djibouti are excluded from the sample. The result also shows that South Africa is nearly at its potential level (95 percent) in terms of its trade with countries in the region.

Table 4b: Actual and Potential Trade in East and Southern Africa: Model Simulation Results

(Ratio of Actual to Potential ratio of regional exports to total exports, in Percent for each country)

Exporting Country	Exports to the Sample East and Southern Africa countries (% of total Country's Exports to all sample Countries in the Model)		Actual to Potential Ratio (%)		
	Model Simulation (Potential, %) [A]	Actual (%) [B]	[A/B]		
Angola	10.9	2.1	19.1	61.4*	
Burundi	22.9	13.7	59.9		
Djibouti	25.4	90.4	356.0		
Ethiopia	24.6	6.0	24.5		
Madagascar	15.9	7.8	49.4		
Malawi	28.8	25.0	87.0		
Mauritius	13.9	23.8	171.1		58.1*
Mozambique	60.6	23.2	38.3		
Rwanda	41.5	5.6	13.6		
Seychelles	11.5	4.9	42.3		
South Africa	8.5	8.1	95.0		
Sudan	8.0	1.0	12.0		
Tanzania	33.7	20.3	60.1		
Uganda	34.1	28.2	82.6		
Zambia	11.2	2.7	24.0		
Average(Simple)				(48.5)**	
Average (Weighted)	23.4	17.5	75.7		

* The ratio for Djibouti is excluding Ethiopia, its major trading partner. Similarly the figure of for Mauritius is excluding Madagascar and South Africa, its major trading partners

** Simple average excluding Mauritius and Djibouti

In sum, the result from the two exercises in this sub-section shows that there is a larger potential for trade among African countries, given indicators of potential trade in gravity model – proximity, cultural affinity and income. This potential is also found to vary both across countries and regions; the West and Central African region, for instance, having relatively more potential than that of East and Southern African countries.

Although gravity model suggest a great potential for intra-Africa trade, this doesn't mean, however, that this potential could easily be realized. What the gravity model suggests is that, given geographic proximity, cultural affinity as well as the size of the economy, as depicted by GDP, the level of intra-Africa trade could have been larger than what it is now. However, since the model is based on the proximity variables noted above and also uses aggregated exports without any regard to the structure of supply of exports from the exporting country and the demand for these exports in the other (importing) country by commodity, it is only a necessary but not sufficient condition for potential intra-Africa trade. The sufficient condition is that what is supplied by one of the African countries, by commodity category, need to be demanded by the other African partner country. This requires examining the pattern of demand and supply by commodity among these countries. Moreover, even if one finds complementarities between the African countries exports and imports, it is imperative to examine the comparative advantage of the potentially exporting African countries in replacing the current trading partners of the potentially importing African countries, which are the OECD countries. The next section discusses these two issues.

2.3. The Structure of African Exports and Imports by Commodity

Using disaggregated commodities form UNCOMTRADE database, this section examines the structure of demand for and supply of exports in Africa by computing trade similarity index for all countries in the continent.

Trade similarity (intensity) indices are generally defined as the ratio of the share of a given country's exports to a partner to the share of the partner's similar index in the global imports of that commodity. For the Sub-Saharan African countries for the years 1989-1995 such indices indicate that the level of African intra-trade is not lower than what should be expected (Yeats, 2004). Similarly Oramah and Abou-Lehaf (1998) computed two different measures of import-export similarity indices which are based on van Beers and Linnemann (1988) approach using the 1993 intra-Africa trade data. Based on the static results of the two import-export similarity indices they used, a gravity equation was estimated including these indices as explanatory variables, to elicit the relevance of these variables in explaining actual intra-Africa trade flows. They also computed a trade potential indicator (TPI) that shows the relative strength of each African country in exporting to other African countries. The results of the study indicate that potential for improving intra-Africa trade, relying on the 1993 commodity composition, is rather modest, with only a few countries having export structures strongly matching the import demands of other African countries. When these measures of absolute trade potential were weighted by economic size of trade partners using the relationship obtained from estimated gravity equations, it was found that the countries that would stand to gain most from greater efforts to advance intra-Africa trade are Comoros, South Africa, Egypt, Sudan, Congo, Cote d'Ivoire, Gabon, Algeria and Cameroon. Those which may not gain as much are Burundi, Namibia, Guinea and Ethiopia due to the poor correspondence of their exports to the imports of economically strong African economies. However, the distributions of gains are likely to be normally distributed without very large extremes (see Oramah and Abou-Lehaf, 1998). This is a story using data 15 years ago. Updating the data for 2007 and also expanding the scope of coverage to all African countries offers empirical evidence about the current state of potential intra-Africa trade. The result of such exercise is important to evaluate the feasibility of exploiting the potential for intra-Africa trade identified in the previous section.

The export similarity index approach originally developed by van Beers and Linnemann (1988) and used successfully by Oramah and Abou-Lehaf (1998) is employed for the analysis in this section (see Appendix II for the methodology). The import-export correspondence index, COS, used in this chapter, vary between zero (no correspondence between the export of country i and the import of country j) and one (perfect similarity). COS is the cosine of the angle between the vectors of country i exports and the vector of country j imports in an n -dimensional commodity space. Using top five import and export commodities of all African countries, for which there is data for the year 2004 to 2007, a COS measure is computed for all African countries. This index may be interpreted as a variable reflecting the expected intensity of bilateral trade flows from exporting country i to importing country j . The similarity of exports and imports of all class of commodities is, however, one of the determinants of trade intensity between two countries. The term 'intensity' is used in van Beers and Linnemann (1988) interpretation to indicate that the analysis abstracts from the economic size of trade partners as reflected in the total volume or value of their exports and imports; the latter are seen as scale factors with which the 'intensity' has to be multiplied in order to arrive at observed or potential trade flow magnitudes. Finally, apart from the degree of similarity between exporting and importing country commodities, other factors such as infrastructure, non-tariff barriers, political factors favoring or obstructing trade (boycott), as well as relative competitive position of exports do determine the level of bilateral trade between a pair of countries. Among all these factors, the role of the degree of similarity in trade structure is a limited yet an important one: without any commodity correspondence no trade will take place, and with perfect correspondence trade possibilities abound (van Beers & Linnemann, 1988).

Table 5 reports estimated results of trade similarity profile of African countries using the export similarity index, COS. (Details of the commodities by value, for selected African countries with the potential to supply the rest of African countries is given in Annex I). A few points need to be noted concerning the estimation techniques used to generate the result in Table 5. First, in computing the similarity measures using aggregate data, aggregated under the Standard International Trade Classification (SITC) format, no information is required about the individual elements of the trade matrix at the commodity class level, that is about E_{ijk} ($-M_{ijk}$). Only total exports of country i in commodity class k (E) and total imports of country j in commodity class k (M) are needed to compute the values of the measures. Van Beers and Linnemann (1988) observe that the implication is that the measures indicate a trade *potential* or *expected intensity* of trade, between a pair of countries. Thus, a non-zero value of COS_{ij} , does not necessarily imply that in actual fact country i does export to country j . The estimated export-import similarity measure can be interpreted as reflecting the expected *intensity* of a bilateral trade flow from exporting country i to importing country j . Second, usually a country with a COS measure equal to or greater than 0.4 would be considered to have a reasonably matching import structure with the exporting country of reference (Beers and Linnemann, 1988; Oramah and Abou-Lehaf, 1998). With this caveat, a summary of the result of the import similarity index, using top five export and import commodities for each African country, using 3 digit SITC classification are given in Table 5.

Table 5a: Import-Export Similarity Index for Africa using the van Beers and Linnemann, Approach (COS measure)

Reporting Country	Greater than 50%	45 to 50%	40-45%	35-40%	Less than 25%
South Africa	Zimbabwe; Botswana Mauritania, Burundi, Ethiopia Kenya	Nigeria Swaziland BurkinaFaso Rwanda, Niger, Tanzania, Tunisia, Zambia	Gabon, Gambia, Malawi, Mauritius Sao Tome & Principe Senegal, Sudan, Uganda,	Benin, Mozambique Ghana, Serra Leone, Togo,	Eritrea, Lesotho, Comoros, Libya (Seychelles, 30- 35%)
Nigeria	Benin, Botswana BurkinaFaso, Cameroon, Burundi, Cape Verde, Cote d'Ivoire Gambia, Guinea, Madagascar, Mali, Mauritania, Mauritius, Malawi, Morocco, Mozambique, Niger, Sao Tome, Senegal, Seychelles, Serra Leone, Swaziland, Togo, Tunisia, Uganda, Tanzania, Zimbabwe	CAR, Namibia	Zambia, Rwanda		Ghana, Libya, Comoros, Gabon, Eritrea, Lesotho, Sudan,
Egypt	Benin, BurkinaFaso, Cameroon, Burundi, Botswana, Cape Verde, Cote d'Ivoire Gambia, Guinea, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Morocco, Sao Tome, Senegal, Serra Leone, Swaziland, South Africa, Togo, Tanzania,	CAR			
Ethiopia					All*
Algeria	Benin, BurkinaFaso, Botswana, Cameroon, Cape Verde, Burundi, Egypt, Cote d'Ivoire, Ethiopia, Gambia, Guinea, Kenya, Madagascar, Mali, Malawi, Mauritania, Mauritius,	CAR, Namibia	Rwanda, Zambia		Sudan, Libya, Lesotho, Ghana, Gabon, Eritrea, Comoros

	Mozambique, Morocco, Niger, Nigeria, Sao Tome, Senegal, Seychelles, Serra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zimbabwe				
Cameroon	Benin, Botswana, Burkina Faso, Burundi, Cape Verde, Cote d'Ivoire, Gambia, Guinea, Madagascar, Mali, Malawi, Mauritius, Morocco, South Africa, Kenya, Egypt, Ethiopia, Nigeria	CAR			Algeria, Comoros, Eritrea, Gabon, Ghana, Lesotho, Libya
Cape Verde	Cameroon, Nigeria, Ethiopia, Egypt, Kenya, South Africa				Algeria
Benin					Cameroon, South Africa, Algeria, Kenya, Egypt, Ethiopia, Nigeria
Botswana					Cameroon, South Africa, Algeria, Kenya, Egypt, Ethiopia, Nigeria,
Ghana					Cameroon, South Africa, Algeria, Kenya, Egypt, Ethiopia, Nigeria

Source: Own computation based on UNCOMTRADE database of the year 2007 for most countries.

Note: To compute the import-export similarity index among African countries, we used the year 2007 data for most countries. But for those countries which have not reported to UN, the recent data is used while omitting countries which don't have any report after 2000 (like Somalia and Angola).

Table 5a shows that the exports of countries like South Africa, Nigeria, Algeria, Egypt and Cameroon fits with the imports of most African countries; though the exports of later group of countries don't match with the imports of the former group of countries. This basically indicates that these countries have the potential to supply exports to the trading partners listed from column two onwards (the best case being columns two and three) although the existing pattern of trade structure doesn't entail reciprocity from the potential importing countries. This may imply lack of adequate incentive from the importers' side to engage in trade with the potential exports. Alternatively there might be other trade constraints that hampered two-way trade between this group of countries.

In Table 5a Algeria, Nigeria and Cameroon in particular have got a high value of import-export similarity index with most African countries because of the nature of their major export commodity which constitutes mineral fuels, mineral oils and related products which are also major importable commodities

by almost all African countries. South Africa and Egypt, on the other hand, are capable of exporting commodities which are processed (or manufactured) that are demanded by the rest of Africa. Table 5 also shows a sample of the majority of countries in the continent such as Benin, Ethiopia, Niger, and Zambia which have export commodities (cotton, edible fruit and nuts; peel of citrus fruit or melons, coffee, tea and spices, oil seeds and oleaginous fruits) which have less or no demand at all in all African countries.

What we can infer from the export import similarity index and its implication in Table 5a is that only few countries have the potential to supply exports that much the demand of the majority of countries. These are Egypt, South Africa, Cameroon, Nigeria, and Algeria, the latter three mainly because of fuel related exports. In fact, as is shown in Table 5b below and in quite detail in Annex I, the composition of export commodities from this top suppliers is not well diversified and limited in matching the demand of the majority of countries in Africa whose import structure is given in the same Annex I. South African exports, for instance, are dominated by mineral and precious metals, followed by Iron and steel and some manufactures while that of Egypt is dominated by mineral fuels and to some degree manufactured goods (See Table 5b). From this analysis it is not difficult to conclude that the potential for intra-Africa trade which seems very large using the gravity model is very modest, at best. The implications of this finding for policy relates to the importance of trade diversification and competitiveness to enhance intra-Africa trade. Thus, it is imperative to identify a strategy of diversification and address major constraints to trade that allows diversification and competitiveness to enhance intra-Africa trade.

Table 5b: Structure of Exports and Imports of Two of the Major Potential Suppliers to Other African Countries by Top five Export Commodity Category: Egypt and South Africa

South Africa: Top Fiver Imports and Exports of, 2007 (UNComtrade)

Code	IMPORTS: Description	Trade Value
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	\$14,847,297,868
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	\$12,791,743,414
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	\$7,991,367,265
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	\$7,663,554,256
99	Commodities not specified according to kind	\$5,812,637,622
	Other commodities	\$30,765,986,779

Code	EXPORTS: Description	Trade Value
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71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin	\$13,065,273,622
72	Iron and steel	\$7,495,582,335
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	\$6,778,513,096
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	\$5,876,854,782
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	\$5,048,987,580
	Other commodities	\$25,761,396,949

Egypt: Top Five Import and Exports, 2007 (UNComtrade)

Code	IMPORTS: Description	Trade Value
99	Commodities not specified according to kind	\$4,102,237,514
27	Mineral fuels, oils, distillation products, etc	\$3,971,427,394
10	Cereals	\$2,532,829,136
84	Nuclear reactors, boilers, machinery, etc	\$2,344,176,890
85	Electrical, electronic equipment	\$1,568,192,402
	Other commodities	\$12,409,982,426

Code	EXPORTS: Description	Trade Value
27	Mineral fuels, oils, distillation products, etc	\$8,454,614,264
99	Commodities not specified according to kind	\$2,630,764,735
72	Iron and steel	\$735,009,780
39	Plastics and articles thereof	\$429,428,189
10	Cereals	\$404,784,316
	Other commodities	\$3,446,039,104

Source: UNComtrade, Accessed February, 2009 (see Also Annex I for detail)

2.4 Revealed Comparative Advantage of African Export Suppliers

Although section 2.3 points out the limited scope to exploit the potential for intra-Africa trade identified in section 2.2, it has also shown that some African countries have, at least, the theoretical potential to supply exports to other countries in the continent. The most important question is then whether these African potential suppliers are actually capable of competitively supplying the other African countries that are currently importing from non-African supplier as suggested by the trade similarity index and the gravity model? In particular, are these countries competitive enough to replace traditional African trading partners which are the OECD countries and the emerging Asian countries such as China?

Empirical studies on similar question for other developing countries are not encouraging. Van Beers and Linnemann (1988) used a wide range of data from developing (including Africa) and developed countries (OECD countries) to examine this issue in the late 1980s. They found that none of the South included in their sample are found to be competent enough to replace the Northern exporters. Heavy reliance of developing countries on developed countries exporters for their supply of manufactured products is at the core of the whole issue of raising South-South trade, as noted by van Beers and Linneman (1988). The picture doesn't seem to differ fundamentally now, some two decades after van Beers and Linneman study. World Bank (1991), for instance, argued that African countries have similar production and exports profiles and therefore have little or nothing to exchange. Other studies (Achy, 2006; Weeks and Subasat, 1998; Roelofsen, 1989; ECA, 1988), however, argued to the contrary, pointing out that intra-African trade potentials are enormous. Consequently, those studies had sought further trade liberalization, and speedier economic integration efforts for the African economies. For instance, the gravity model based study for the Northern African countries of Achy (2006) revealed that, compared to international trend, the actual North African intra-regional trade is ten times lower than its potential (Achy, 2006). Achy (2006) using complementarities index further indicated that a strong correlation exists between the complementarities index of trade and the intra-regional trade rate. A sufficient condition for the assertion of the latter group of studies is to examine the relative competitive position of African suppliers to supply other African countries which are currently importing from none-African suppliers.

In Table 6, the relative value of the revealed comparative advantage indices of manufacture exports of some African countries with potential to supply other African countries (South Africa, Egypt, Cameroon, Nigeria, Algeria, Kenya) with the current major African suppliers (Western Europe, USA, Japan, and emerging China and India) is computed and reported. Other indicators of competitiveness of these two groups of suppliers is also given in Table 7. The revealed comparative advantage is based on Balassa's (1965) approximation using post-trade data that manifests both post-trade relative prices and prevailing factor and product market distortions (see Box 1).

Box 1: Revealed Comparative Advantage Computation

According to Balassa (1965, 1979) (see also Mahmood, 2001) comparative advantage is revealed in relatively high shares of export markets. However, to evaluate what is low, Balassa (1965, 1979) called for these shares to be compared to some average. Defined as such, the revealed comparative advantage index (RCAI) compares a country's world export share of the commodity in question with the total world export share of the total exports of the country in question. If a country's share of world export of a particular commodity is greater than the country's share of world exports of all commodities, the RCAI will be greater than one- indicating that this country has RCA in that product. (see for example, Lutz 1987; Rana 1990; Dowling and Cheang 2000; Mahmood 2001; Alemayehu and Atenafu, 2008). Formally, the RCA index could be given by (see Kwan, 2002; Alemayehu, 2009):

$$RCA = \frac{(X_{ij}/X_{wj})}{(X_i/X_w)}$$

Where: RCA, X, i, j and w refer to 'revealed comparative advantage', exports, product, country and world respectively. $RCA > 1$ implies having 'revealed comparative advantage'.

Table 6 provides the revealed comparative advantage of potential African suppliers and the current suppliers of exports to Africa. As can be read from the table the African suppliers RCA is less than half the level registered for OECD countries as well as China and India. Within Africa, South Africa, followed by Egypt and Kenya, are relatively in good shape in terms of RCA, although all of them do not have a comparative advantage with any of the current manufacture suppliers to African countries. The information from Table 6 further shows how challenging it is to exploit the potential for intra-Africa trade suggested by the gravity model result in section 2.1 and 2.2.

Table 6: Revealed Comparative Advantage for Potential African Suppliers

	2002	2003	2004	2005	Average (2002-2005)
Algeria	0.04	0.03	0.03	0.03	0.03
Cameroon	0.09	0.09	0.07	0.04	0.07
Egypt, Arab Rep.	0.46	0.41	0.40	0.41	0.42
Kenya	0.31	0.32	0.28	0.28	0.30
Nigeria	0.06	0.03	0.03	0.03	0.04
South Africa	0.81	0.76	0.75	0.75	0.77
China	1.16	1.19	1.20	1.22	1.19
India	0.97	1.00	0.95	0.93	0.97
Japan	1.20	1.22	1.22	1.22	1.21
Korea, Rep.	1.19	1.21	1.21	1.20	1.20
Germany	1.14	1.11	1.13	1.10	1.12
Italy	1.14	1.13	1.15	1.13	1.14
Netherlands	0.90	0.92	0.91	0.90	0.91
France	1.08	1.08	1.08	1.06	1.08
United Kingdom	1.08	1.08	1.00	1.02	1.05
United States	1.07	1.07	1.08	1.08	1.08
High income OECD	1.05	1.05	1.05	1.04	1.05
Sub-Saharan Africa	0.48	0.43	0.43	0.44	0.45

Source: Own Computation based on WDI, World Bank (2008)

In addition to the RCA shown above, Table 8 offer other related indicators of competitiveness between potential African supplier and the current OECD export suppliers to the continent. Consumer price index (CPI) ratio, as an indicator of general prices, is widely used for this purpose. As Table 7 shows in all African countries identified as potential suppliers their domestic price is found to be larger than the domestic price of the current export suppliers (trading partners) of Africa. The African potential suppliers do not also seem to fare better either in the relative level of their real effective exchange rate, export unit price or the composition of their exports (see Table 7) with these countries. This again shows how limited the potential for intra-Africa trade is.

Table 7: Some Indicators of Comparative Advantage of African Potential Suppliers vis-à-vis Current Suppliers

.Potential Africa Suppliers	CPI Ratio of African Potential Suppliers with*			Real effective exchange rate index of African Potential Suppliers		High-technology exports (% of manufactured exports)**	Export Unit Price Ratios of African Potential Suppliers		
	With OECD	with China	with India	With OECD	With China		With OECD	With China	With India
Algeria	1.02	1.06	0.95	0.89	0.93	1.82	1.25	1.29	1.24
Egypt, A	1.01	1.11	0.99	nd!	nd!	0.62	1.12	1.15	1.11
Cameroon	1.01	1.05	0.94	1.06	1.11	1.39	1.16	1.20	1.15
Kenya	1.14	1.19	1.06	nd!	nd!	5.20	nd	nd!	nd!
Nigeria	1.52	1.55	1.39	1.10	1.15	0.87	1.19	1.22	1.17
South Africa	1.10	1.16	1.04	0.93	0.98	5.66	1.36	1.40	1.34

Source: Based on World Development Indicators (World Bank, 2008)

Note: There is no data for OECD as a group in WDI, except for the first column, CPI. Thus, a simple average value of Italy, Japan, Korea, Netherlands, Sweden, United Kingdom, United States and France for the year 2001-2005 is used to represent major OECD trading partners of Africa.

** The Comparable figure for OECD, China and India are 22, 24 and 4.7 % , respectively.

In sum, our analysis in this section shows that although given geographic proximity, economic size and cultural affinity African countries have a large potential for intra-Africa trade, its realization is constrained by lack of diversification and competitive position of potential African export suppliers. This makes the short run potential of intra-Africa trade very modest. This doesn't mean, however, that there is no potential for intra-Africa trade at all. Yes, there is a potential as we have shows in section two of this chapter but its realization requires addressing squarely constraints to export supply and diversification. These are the two major challenges of intra-Africa trade and regional integration in Africa. This in turn requires unpacking what is behind supply constraint and hence competitiveness as well as the record of poor diversification in the continent. The first step towards that endeavor is to identify these constraints and suggest how to address them. The next section is devoted to that issue.

3. Export Supply Constraints and Lack of Diversification as a Challenge to Intra-Africa Trade

The analysis in the previous sections points to the fact that despite the potential for intra-African trade, that trade is modes owing to lack of diversification and competitiveness. The latter issue being determined by supply side constraints as well as trade facilitations and infrastructure that makes intra-Africa trade feasible. This section will focus on highlighting major factors behind these constraints with a view to point at policy direction for future action. In sub-section 3.1 the major constraints to intra-Africa trade (and hence also to regional integration) are examined. These problems could be categorized as:

- a) The nature of African economies and lack of progress in regional integration
- b) Absence or poor state of trade related infrastructure (trade logistics included)
- c) Macro policy related problems such as lack of macroeconomic coordination including the multiplicity and inconvertibility of currencies
- d) Supply side measures: Export promotion, inefficient customs administration, international payment mechanism and related trade facilities

The section attempts to address these issues using secondary data and a gravity model for all African countries. The gravity model shows the major determinants of trade in Africa that include the role of RECs. Sub-section 3.2 will attempt to concretize the result obtained in sub-section 3.1 using primary data from five case study countries on constraints to export supplying Africa. This information is based on ongoing AERC² research on the issue.

3.1 Export Supply Constraints

The degree of similarity in the commodity composition of exports and imports is only one of the factors that determines the intensity of trade between a pair of trade partners. Even if we have good trade similarity indices across Africa actual trade might be below the potential, as we have seen it in the previous section, owing to other factors that include the following four major supply side constraints that are briefly outlined below.

1) The Nature of African Economies and Lack of Progress in Regional Economic Integration

The sizes of most African markets are small which has a direct bearing on the volume of trade. Such economies are not competitive because of the miss-fortune of diseconomies of small scale and high transaction costs. These countries cannot generate adequate quantity and quality of competitive exports; they cannot attract significant amounts of foreign investment either. Active engagement on the global economy could help such African countries to overcome small internal markets constraints; however exporting at world prices is challenging for many Africa countries. A small economy can address the scale problem by buying inputs from international efficient producers and export at world prices. Trade could nevertheless still be costly. Reasons for this include: small consignment size, small-scale infrastructure and a lack of competition given that these countries' costs of trade may be inflated, making the cost of their goods and services higher than the world minima (Njinkeu and Fosso, 2006). This is aggravated by severe competition from other relatively developed countries and emerging economies such as China and India. This is a challenge to most African countries. One policy option to address this problem is to pursue regional integration vigorously. This is becoming difficult owing to the structure of production and trade of African countries as we have seen in the previous sections.

² We are grateful to AERC, its Executive Director Prof. W.Lykura, the Research Director, Prof. Olu Ajakiye and Project Coordinator of Export Supply Constraint, Prof. Ademoal Oyijide for allowing us to use this information (which is in line with the AERC mission of informing policy making by research).

The relatively small weight of intraregional trade in Africa, despite the existence of several (and frequently overlapping) RECs, is due largely to their structure of production and the composition of their exports. As many countries are still specialized in a small number of primary commodities, while most of their imports consist of manufactures, the potential for intraregional trade is limited, especially owing to lack of diversification and competitiveness. We have shown the empirical evidence for this in the previous section. (see also UNCTAD, 2007; Limao and Venables, 2000). For instance, the relatively low level of intraregional trade in ECOWAS, according to Shams (2003), is explained by the high dependence of most member countries on exports of primary commodities, and by a trade liberalization scheme that has very strict rules of origin. Access to the regional market is especially difficult for those firms and sectors that are at an early stage of development, given the low degree of internal integration. Such firms have to rely on imported inputs, and the content of domestic value added in their products is often too small to satisfy the rules of origin. In early 2000, only 17 manufacturing firms in the region were able to comply with these rules (Shams, 2003).

Progress in regional integration, which would have been an invaluable instrument to expand intra-Africa trade is limited mainly due to unwillingness of governments to (i) surrender sovereignty of macroeconomic policy making power to a regional authority; (ii) face potential consumption costs that may arise by importing from a high-cost member country; (iii) accept unequal distribution of gains and losses that may follow an integration agreement at least in the short run and (iv) discontinue existing economic ties with non-members (Johnson, 1995; Alemayehu and Haile, 2008). Although it is difficult to establish whether intra-Africa trade causes progress in RECs or the other way round, the two could be reinforcing each other to bring progress in economic integration (see the evidence in the next sub-section) in the region yet both are currently at low level of development.

2) *Absence (or Poor state) of Trade related Infrastructure*

In many cases, formal trade liberalization is not successful partly because some fundamental aspects of trade logistics, such infrastructure were limited. Infrastructure plays a crucial role in raising intra Africa trade, and hence regional growth rates. According to Longo and Sekkat (2001) a one per cent increases in the stock of transportation and telecommunication infrastructure in the exporting country boosts its export towards other African countries by about 3 per cent (Longo and Sekkat, 2001). Poor infrastructure, or its complete absence, makes trade physically difficult, if not impossible, quite independently of the trade regime. As can be read from Table 8 below, for instance, the length of paved roads as percent of total roads in Africa is about 5 times lower than that of high income OECD countries (and nearly two-third of the OECD level in North Africa). The telephone coverage is much worst for both North and Sub-Saharan Africa compared to that of OECD level, as can be read from the Table 8, second column.

The existence of tariff barriers or quantitative constraint pose formidable obstacles to trade, but they do not render trade exchanges completely impossible, as does the absence of an appropriate regional infrastructure (UNCTAD, 2007). According to the ARIA study (2004) about the Regional Integration in Africa (ECA) transport costs are 63 percent higher in African countries compared to the average in developed countries. They are estimated at 14 percent of the value exported in the first group of countries, against 8.6 percent only in the second. According to UNCTAD, as quoted by Lisinge (2005),

the freight cost, as a percentage of the imported value, stood at 11 percent for North African countries, i.e. 111 percent more than industrialized countries and 25 percent more compared to the average in developing countries. Similarly, Collier and O'Connell (2006), cited in Njinkeu and Fosso (2006), estimated that coastal areas have a growth advantage of about 1.5 percentage points better compared with their landlocked counterparts. As about 35 percent of African population live in land locked countries, compared to the global average of 1 percent (Njinkeu and Fosso, 2006), regional integration may allow landlocked countries to narrow this growth gap in Africa.

Table 8: Some Indicators of Macro and Infrastructure in Africa 2000-2005 (average)

	<i>Macro Indicators</i>			<i>Infrastructure Indicators</i>	
	RER	CAB	Growth	Roads	Telephone
High Income Countries (OECD)	100*	-2*	2.3	94.3	574.1
Africa	101.1	0.3	4.2	22.7	28.4
North Africa	93.4	5.1	3.9	60.9	90.3
Sub-Saharan Africa	103.5	-2.2	4.3	18.2	15.0
Sub-Saharan Africa excluding South Africa	104.2	-2.5	4.6	17.5	8.4
Sub-Saharan Africa excluding South Africa and Nigeria	103.1	-4.3	4.3	17.7	8.8

Source: Based on World Bank, ADI (2008a) and WDI, World Bank (2008b)

Note: RER=Real effective exchange rate index (2000 = 100) (%)

Growth=GDP annual growth (%)

Roads=Roads, paved (% of total roads)

Telephone=Telephone mainlines (per 1,000 people)

* The figure of CAB and RER was -6 and 93 for USA; and -2 and 101 for UK respectively for year 2005

Casem (2001) examined how trade logistics, level of economic development and the size of the economy influence the bilateral trade potential in Southern African countries. His study shows that transaction cost of trade, the growth paths of economies and changes in per-capita income should be the focus of economic policy to reap from intra-Africa trade in the region. Intra-regional trade liberalization could engender further trade potential in some country combinations. Indeed this will depend not only on tariff liberalization but also on overall reduction in trade costs (Casem, 2001). Similarly, Shams (2003) noted that some of the major obstacles to intraregional trade in West Africa are bureaucratic and physical ones, such as road charges, transit fees and administrative delays at borders and ports, which raise transport costs and render deliveries unreliable (Shams, 2003). Using a modified gravity model, Augustine and

Nwabuzor (2002) examined the impact of infrastructure on African trade. Their analysis revealed that while trade flows among ECOWAS member nations have been growing; inadequate infrastructure has deterred this growth. There is also a strong indication that these impediments have tended to increase transaction costs. There is a supporting evidence of a similar nature shown in sub-section 3.2 below.

Deficiencies in telecommunications services, as another set of trade infrastructure, have also tended to isolate African states from each other (see Table 8). Consequently it is much easier and comfortable for businessmen in Africa to deal with their counterparts in Europe and North America than fellow businessmen in the continent (Yeboah, 1993). Intra-Africa trade is further constrained by absence of market information. While the standard trade theory assumes that information-such as about the availability of the products in the foreign countries, their characteristics and prices-is perfect and costless, in Africa where communication links among countries are few and indirect, relevant market information may be costly to obtain for both importers and exporters (Yeboah, 1993).

In sum, transport costs in Africa are recorded to be the highest in the world. The freight costs as percentage of total value of import was about 13 percent for the continent in 2000 while it was 8.8 percent for all developing countries and 5.2 percent for developed countries (UNCTAD, 2002). The freight cost differs from region to region in Africa with East and South Africa experiencing higher cost compared to other region in the continent. Similarly, Ackah and Morrissey (2005) noted that transport cost constitute about 15 percent (this being about 20 percent for landlocked countries) of unit value of exports in Africa, which is considerably higher than other regions such as Asia, about 8 percent and Western Europe about 5 percent. This high transport cost is mainly attributed to poor infrastructure which increases the trading costs (lowers competitiveness) and result in lower level of intra-Africa trade.

3) *Lack of Macroeconomic Coordination in general and the Multiplicity and Inconvertibility of Currencies in Particular*

Macroeconomic coordination is important to enhance intra-Africa trade and regional integration because success on trade liberalization and growth could be undercut by problems of macro policy coordination. Although the liberalization policy pursued in almost all African countries has resulted in relatively better fiscal posture and some degree of success in managing major macro variables, the macro environment and the current fiscal posture (including indebtedness) in Africa leaves much to be desired. Growth in the last five years has been good in most African countries. However, other indicators of macro stability such as current account balance, exchange rate, and budget deficit were not impressive. Even the excellent growth record is recently eroded owing to the current global crisis (see Table 8). There is also variation across countries in meeting macroeconomic targets which is one of the reasons for falling to meet the convergence criteria drawn for various RECs in key macro variables. This requires, among other things, to have an institutional framework for realizing macro policy harmonization for regional integration. Establishing the institutional framework for macro policy harmonization and maintaining the surveillance mechanism to monitor the convergence criteria drawn is a daunting task. It requires: the submission of certain degree of autonomy in domestic policy making by member countries, establishing an elaborated and transparent institutional mechanism, and deploying a skilled labour force. This is what the history of European integrations shows. Studies on the issue show that there is an enormous variation across RECs and member countries in terms of the macroeconomic environment, the fiscal posture, asymmetry of

shocks as well as the policy response to such shocks (see Alemayehu 2001, Weeks, 2008). This underscores the need to design a macro policy harmonization scheme that suits the specific context of each REC with adequate safeguard measure for weaker members.

A closely related macro policy harmonization agenda is the issue of currency. Establishment of monetary unions in Africa can play a vital role in promoting intra-Africa trade. It is estimated for instance that a pair of countries that start to use common currency may see a near doubling of their bilateral trade. Thus, the effect of currency union on trade is positive, significant and large (see Rose, 2002; Rose and Engel, 2002; cited in Njinkeu and Fosso 2006). The multiplicity of currencies compounded by exchange rate problems encourages underground trade in the form of smuggling, and an expanding unrecorded trade (Yeboah, 1993). Multiplicity of currencies do also raise international trade costs as businessmen are confronted with the cost of changing from one currency to another as well as the uncertainties associated with the market for these currencies.

CEMAC and UEMOA are monetary unions, with CFA franc as the common currency. Although formally differentiated, the common currencies are exchangeable between the two communities one to one and are convertible into the euro at a fixed exchange rate. Southern Africa, Namibia and Swaziland are members of a Common Monetary Area, where the South African rand circulates freely as a common currency under a floating arrangement. In EAC, all three members (Kenya, Tanzania and Uganda) have floating currencies. Most of the non-UEMOA members of ECOWAS also have floating exchange rates. Although these are encouraging trends, the multiplicity of currencies and exchange rate arrangements (including uncertainties associated with them) that exist in Africa makes a case for the establishment of clearing mechanisms in the short run and some kind of monetary union in the long run. ECOWAS and COMESA formally established clearinghouses to promote intra-community trade with the use of local currencies against a background of exchange control dictated by the scarcity of hard currencies in most countries (IMF 2001). It is high time to build on this fragmented and less organized, yet important initiatives so as to build and enabling macroeconomic environment for intra-Africa trade.

4) Other Supply Side Measures: Export Promotion, Inefficient Customs Administration, International Payment Mechanism and related Trade Facilitation Measures

Trade and industrial policy making in newly developed Asian countries featured prominently in their impressive growth record of the last five decades. Supply side measure that includes export promotion policies, appropriate and timed incentive structure as well as efficient bureaucracy, including customs authority, at the service of exporters is central for their trade growth. Failure to enhance trade facilitation measures such as these hinders trade by reducing market access through delays and higher costs. They also raise input cost. These would erode the competitiveness of exporting firms (Biggs, 2007).

Customs authorities in many African countries are inefficient. Overall, delays at African customs are on average longer than the rest of the world: 12 days in countries South of the Sahara, compared to 7 days in Latin America, 5.5 days in Central and East Asia, and slightly more than 4 days in Central and East

Europe, adding a tremendous cost to importers and exporters each passing day at custom's warehouse (ECA, 2004). Such delay increases the transaction cost of trading between African countries.

Generally, each day lost in transport delays due to customs and related problems is equivalent to a tax of about 0.5 percent (Hummel 2000, reported in Global Economic Prospects, 2005, World Bank). The situation in crossing borders between African countries can be even worse. In Southern Africa, delays at the main border crossing between South Africa and Zimbabwe (Beit-Bridge) amounted to six days in February 2003, leading to an estimated loss in earnings per vehicle of US\$1,750, equivalent to the cost of a shipment from Durban in South Africa to US. Another study (Alvis 2004) indicates that crossing a border in Africa can be equivalent to the cost of more than 1,000 miles of inland transportation compared to its equivalent of 100 miles in western Europe (World Bank, 2005). Border crossing delays are also linked to other trade costs as well, especially corruption in customs.

Another obstacle related to trade facilitation includes problems with international payments mechanisms; insurance requirements; and customs guarantees. Documentary credit payment which is popular in the African countries is characterized by cumbersome and complex procedures. The basis of the system is a series of checks in which the progress of goods towards the buyer is pinned to the progress of payment to the seller. The process is time consuming, requires physical movement of documents between different banking establishments in two different countries and is not well understood and badly managed by many users. Indeed it has been reported that half of all requests for payment are rejected on grounds of documentary inconsistencies (Njinkeu and Fosso, 2006). In addition, delays and complicated procedures related to insurance of good and customs guarantee requirements are believed to raise the cost of exports from Africa and hence its competitiveness both in Africa and non-African countries. It is estimated that each day of delay reduces export volume by about 1 percent. With this rate, if Uganda, for instance reduces its factory-to-ship time from the current level of 58 days to 27 days, its exports would have increased by 30 percent (Njinkeu and Fosso, 2006). Table 10 also shows how competitiveness in African trade could be adversely affected by delays in customs clearing, cost of doing business, business regulatory environment and macroeconomic management, where African countries hardly register good ratings.

Table 10: Some Indicator of Competitiveness related to Trade facilitation for Selected Countries

	<i>SSA</i>	<i>North Africa</i>	<i>Rwanda</i>	<i>South Africa</i>	<i>Angola</i>	<i>Botswana</i>	<i>Egypt</i>
Average time to clear customs (days)	4.2	2.4	6.7	4.3	16.5	1.2	na
Trade rating (1=low to 6=high)	3.6		3.5	na	4.0	na	4.0
Cost of business start-up procedures (percent of GNI per capita)	162.9	28.1	188.3	6.9	486.7	10.6	68.8
Business regulatory environment rating (1=low to 6=high)	3.1	3.0	3.5	na	4.0	na	na
Macroeconomic management rating (1=low to 6=high)	3.5	na	4.0	na	3.0	na	na

Source: Based on World Development Indicators, World Bank, 2008b.

To give a quantifiable dimension of the issues briefly outlined in this section (infrastructure, trade related policies, the ease of 'doing businesses and the role of regional economic communities), a gravity model of determinants of African trade is specified and estimated. (see Appendix I for model specification). The result of this model is reported in Table 10. This gravity model is similar to the others used in the previous sections. However, it is estimated for all African countries using the data for the year 2000 to 2006. In addition to traditional gravity model variables, membership to African RECs (UMA, ECOWA, SADE and COMESA), infrastructure indicators (number of mobile phones per 1000 population, and paved roads as percentage of total roads in the reporting African country), market access indicators in importing countries (taxes on international trade) as well as policy indicators variables such as net FDI in the reporting African countries) are used. These are believed to roughly summarize factors mentioned in this section as a supply constraint that are quantifiable and available.

Table 10:: Gravity Model: All African Countries, 2000-2006

(Dependant variable is log of bilateral trade (Trading Partners: World, including Africa)

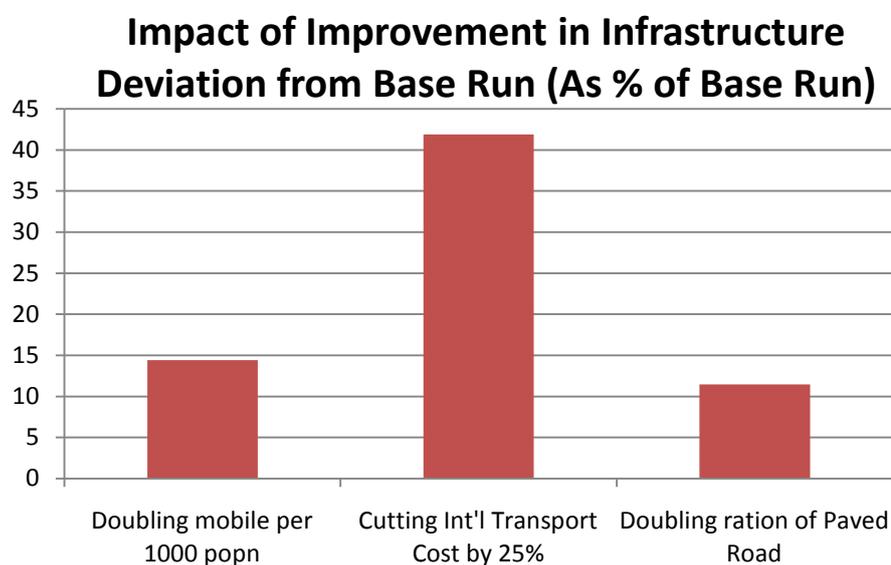
	Tobit Equation	
	Coefficients	t-value
UMA	0.54	0.7
ECOWAS	1.05	3.4 *
SADEC	1.05	2.6 *
COMESA	0.42	1.5 ***
Ln (Area _j)	-0.23	-5.7 *
Ln(Area _i)	0.01	0.1
Ln(GDP _j)	1.14	21.0 *
Ln(GDP _i)	0.42	4.9 *
Ln(Dist)	-1.23	-11.6 *
Ln (Mobile _i)	0.19	2.6 *
Ln(Road _i)	0.16	2.6 *
Land Locked	-0.47	-2.6 *
Border Share	0.79	2.5 *
Ln(FDI _i)	0.16	2.3 *
Ln(Dif_Percapita)	-0.06	-1.0
Ln(Taxe_Intnl _j)	-0.06	-2.7 *
Language_offical	0.60	4.4 *

Constant	-28.22	-17.1 *
Pseudo R-Square	0.1833	
No of Observation	2382	
Log Likelihood	-2400.18	

*, **, *** Significant at 1, 5 and 10 percent , respectively

As can be read from Table 10, all traditional gravity model variables are found to be important determinants of African trade. Among these, distance from trading partners (a proxy for cost of international transport), the income of trading partners, sharing border, landlockedness, in the order of importance, are found to be the most important determinants of African trade. Internal infrastructure, another indicator of supply constraint related to transport and communication (whose proxies are number of mobile phones and percentage of paved roads) is found to have positive and statistically significant impact on bilateral trade. In fact a simulation of doubling these infrastructure indicators (number of mobile and proportion of paved roads) using the above gravity model could improve African trade by about 15 percent. Similarly cutting international cost of transport by 25 percent could lead to raising the level of African trade by over 40 percent (see Diagram 1).

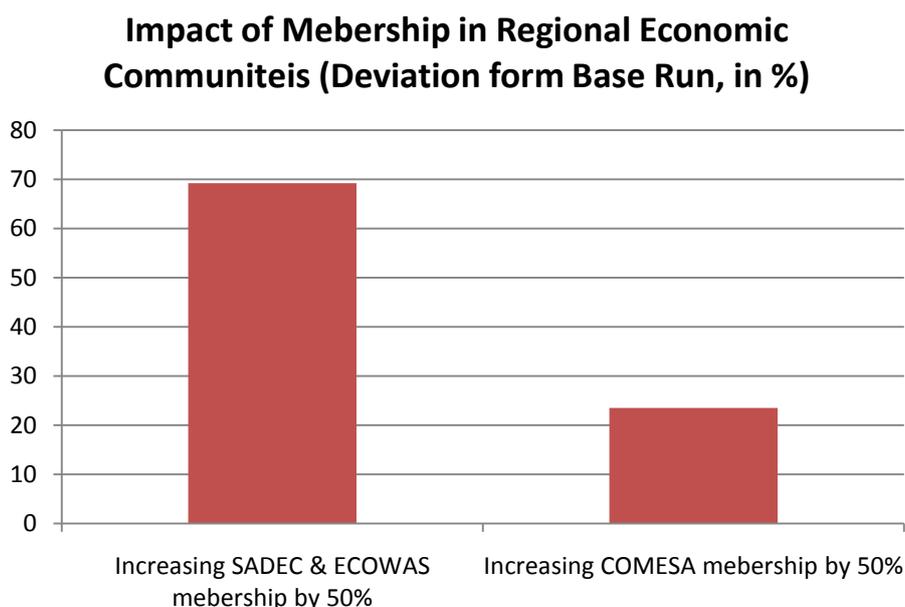
Diagram 1: The Impact of Infrastructure (Transport and Communication) on African Trade



Equally, the result shows that belonging to regional economic communities is generally found to have a positive effect on bilateral trade in all cases except for UMA. Although the coefficient for UMA is positive it is not statistically significant, perhaps confirming the finding of UNCTAD (2005) about the low level of trade among North African countries and that of Achy (2006) who observed that UMA trade is ten times below its potential. On the other hand, ECOWAS and SADEC, followed by COMESA are

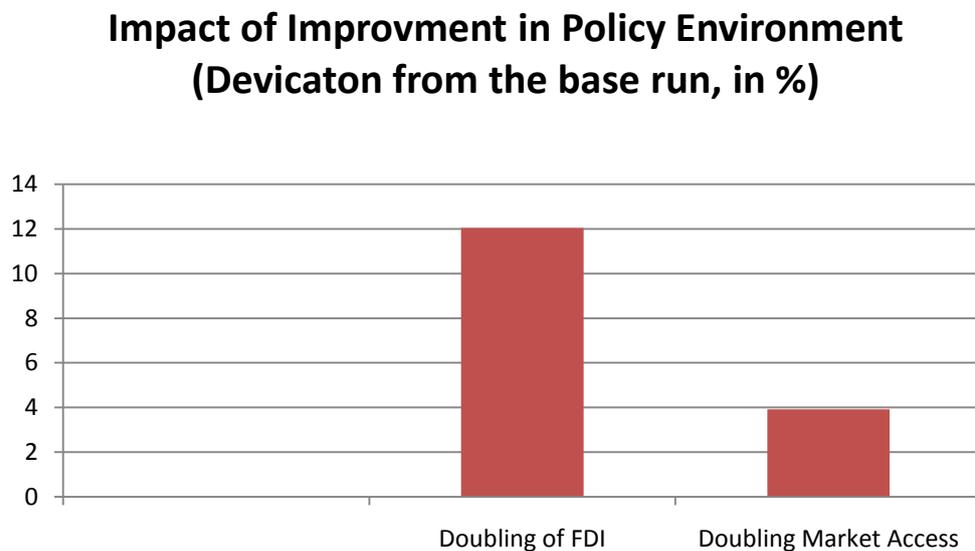
found to strongly and positively influence bilateral trade of African countries – and hence a case for RECs and Intra-African trade. A simulation exercise using the model shows that increasing the membership of countries in SADEC and ECOWAS by 50 percent may lead to an increase in African trade by about 70 percent. The comparable figure for COMESA is about 20 percent (see Diagram 1).

Diagram 2: Simulation of Increasing Membership in RECs by 50 Percent



Finally, policy and cultural indicators (such as FDI – it is assumed that apart from its important in its own merit, FDI is normally attracted to countries with conducive macro and institutional environment and hence could be a good indicator for that) and sharing official language are found to have positive and statistically significant effect. The model shows that doubling the level of FDI through enabling macroeconomic environment and improved institutions may lead to a rise on African trade by over 12 percent (see Diagram 3). Though not statically significant, the percapita income gap has the right sign, the higher the income gap, the higher the demand gap and hence low trade – called ‘the Linder Effect’. Market access in partner countries (whose proxy is tax on international trade) is also found to have statistically significant negative effect on African exports although its potency (coefficient value) is not strong. Our model simulation shows that reducing taxes on international trade in partners countries by half will lead to an increase in African trade only by 4 percent.

Diagram 3: The Impact of Improved Policy Environment on African Trade



In sum, this section has examined the fact that even if African countries have potential for trade as well as good trade similarity indices, the supply constraint will act as a major hindrance to realize that trade potential. These supply side constraints are briefly summarized based on available information on the issue in Africa. The quantifiable dimension of this issue is also summarized using a gravity model for Africa. The result confirms not only the importance of RECs to enhance African trade but also the importance of the supply constraining factors in determining the level of African trade through its competitiveness. Thus, progress on intra-Africa trade, and hence also on regional integration in Africa, requires addressing these major constraints to intra-Africa trade. To give a firm foundation for this argument this section will conclude by examining the recent evidence on the issue from case studies of an ongoing research on the issue on five African countries.

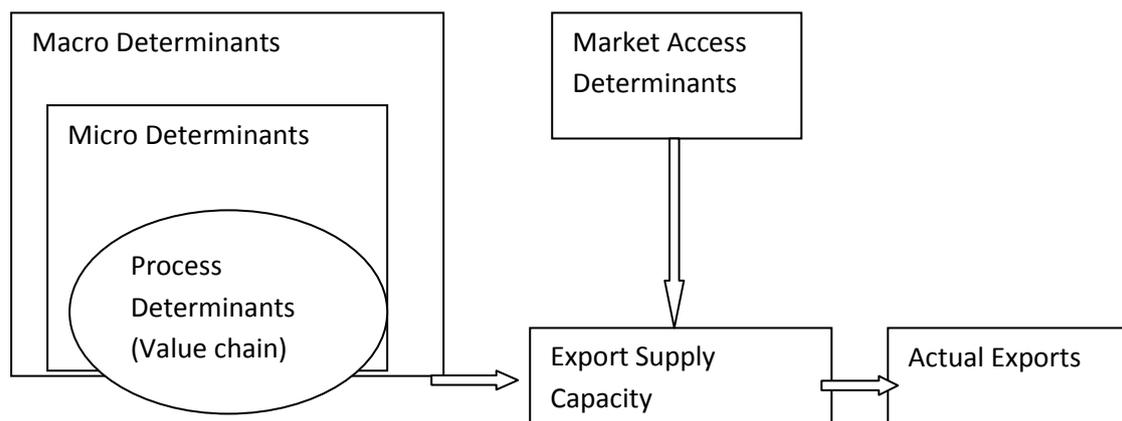
3.2 New Evidence from County Case Studies of Supply Capacity Constraint in Africa

Country level in-depth study about supply capacity constraint in Africa is absent in the literature. Recently, however, the African Economic Research Consortium (AERC) is conducting an in-depth study on the issue on a sample of countries: Ethiopia, Kenya, Ghana, Mauritius, the Sudan, Togo and Uganda. The major findings of these studies (summarized from the interim reports) are briefly offered below. These new findings generally corroborate the general picture given by our model above.

The AERC case studies are geographically representative countries. These studies managed to see the supply constraints of both traditional and non-traditional exports from macro (using macro data), micro (using

sample survey) as well as process (using value-chain analysis) perspective. These in turn are confronted with market access condition in the destination of African exports to determine the level of actual African exports, as depicted by Diagram 1. The evidence shows that although different factors have different degree of importance across countries, some commonality could be read from country case studies, as can be inferred from the brief description of each country given below.

Diagram 1: The Analytical Structure of the AERC Study



In the case of *Sudanese* traditional exports (both raw and processed agricultural exports), the real exchange rate, high input costs, old and outdated equipment, high cost of energy, high port charges are found to be the most binding supply side constraints of traditional exports. The recent fast growing export of oil is a non-traditional export for the Sudan which is increasingly dominating the export sector (see Maglad *et al*, 2009). One noticeable phenomenon in this connection is a decline in the traditional exports of the Sudan that is accompanying the surge in oil exports – indicating a possibility of the so called ‘Dutch Disease’ effect. One possible implication of this latter phenomenon is the possibility of a decline in traditional exports following resource discovery that may occur in other African countries too.

The supply constraint study for *Ghana* has focused on non-traditional exporting firms in the garment and furniture exporting sub-sector as well as in Ghana’s traditional exports of Cocoa, Minerals and Timber. In the latter group of exports, macroeconomic indicators such as real exchange rate and the level and growth of Ghana’s trading partners’ income is found to be important determinants of export growth. These exports are also found to be adversely affected by a combination of expansionary macroeconomic policies and restrictive trade policies. Similarly constraint imposed by institutional and regulatory rules is estimated to impose costs equivalent to 4 to 20 percent of the fob value of exports. In the non-traditional export sector, in addition to conducive macroeconomic environment, competition both from foreign and domestic firms, insufficient demand, high cost of inputs or uncertain supply and poor quality of inputs, as well as high taxes and interest charges (finance), in their order of importance, are found to be the major constraint to export supply. These supply side constraints are found to be important not only for both exporting and non-exporting firms in Ghana but also between the garment and furniture exporting firms chosen for the study (see Akouoni *et al*, 2009). The Ghanaian (as well as the Kenyan) study has also shown that government could play a positive role in exporting by creating the skilled labour necessary for exporting firms (see Box 2).

Box 2: Role of Government in Supply of Skilled Work Force, Technology transfer and Export Supply Facilitation for Export Sector in Ghana and Kenya.

During the implementation stages of the Ghanaian President's Special Initiative for Textiles and Garments about a decade ago it was realised that the available proportion of skills required for the factories to operate was inadequate. The implementation team therefore scouted for local expertise in the polytechnics and then brought in experienced personnel from East Asia to train them.

The training centre was established in 2002 to train employable manpower which was found lacking at all levels of the garments industry, this included managers, supervisors, technicians and machinists. Basic skills training takes place for a period of 4 weeks, after which the trainees acquire further specialised training in the factory. Initially, industries were involved in facilitating the importation of the required skilled labour. Experts were imported from India, Sri Lanka, Mauritius, USA and South Africa to carry out training and impart best practice. Currently, the training centre is managed by a Ghanaian, but still has some expatriate staff. The centre currently has the capacity to train up to 10,000 people a year; however, it has only trained about 9,500 machinists in the last six years. In addition to machinists, supervisors were also trained.

Almost 80 percent of firms interviewed (in 2009) were of the view that the quality of workers on the market had improved in the last five years. All of the furniture exporting firms interviewed were of this view. Almost 70 percent of the firms in the survey of garments and furniture firms claimed they were satisfied with the skills of their workforce. Focussing on the sub-set of exporting firms a lower proportion is satisfied with the skills of the workforce. A recent assessment of the President's Special Initiative for Clothing and Textiles identifies low training capacity as one of the four challenges facing the Initiative. There is a large turnover of labour in the garments industry. It is therefore necessary that there is a pool of skilled workers that firms can hire from when workers leave. The skill supply by the government was central to deal with supply side constraints of exporting firms.

Within the export sector, the results of a survey indicate that a significantly higher proportion of garment firms (i.e. 70.4 percent) as compared to 50 percent of furniture firms indicated that they had adequate access to technology. The significant difference could be a direct result of efforts that have been put in place under the President's Special Initiative on Garments and Textiles to provide support towards the acquisition of appropriate technology aimed at helping local garment manufacturers to take advantage of the enormous opportunities offered under the African Growth and Opportunity Act (AGOA).

Similarly, the Kenyan government helped the growth of its non-traditional export sector (horticulture) through **The Horticultural Crops Development Authority's (HCDA)** legal provision to promote and develop production and marketing of horticultural produce. The focus of the Authority was mainly on the smallholder farmers who had the potential to utilize their own labour, as production is labour intensive. The

HCDA provided all the packaging material at cost and airspace booking services in conjunction with and involvement of the Ministry of Agriculture Inspectorate staff. Over the years, HCDA's functions have evolved with the changing government policies and industry demands. HCDA also has field offices which provide extension services to farmers; provide advice on methods of production, correct use of fertilizers and pesticides, and even advice on meeting specific requirements such as standards. HCDA also provides information and market linkages to farmers and potential exporters. It oversees the signing and implementation of contract between farmers and exporters and has therefore played an important role in the marketing and export of horticultural produce from small holder farmers – hence the unprecedented growth of this export sector in Kenya

Adopted from Akouoni *et al* (2009) and Onjala and Otieno (2009).

In *Ethiopia's* and *Kenya's* export supply studies both traditional (live stock and livestock products) and non-traditional exports (horticulture, including cut flowers) are investigated. The result shows that at macro level, the demand for African exports (depicted by the level and growth of income in Ethiopia's and Kenya's trading partners), appropriate real exchange rate and domestic capacity (depicted by GDP and its growth) are found to be important in determining both traditional and non-traditional exports. For non-traditional exports, the evidence at firm and farm level indicate that poor road network, high cost of electricity (in Kenya) and high cost of imported inputs such as fertilizer and pesticides (both in Kenya and Ethiopia) are found as major constraints of export supply. In the traditional exports of both countries, low quality of inputs such as hides and skins, competition from other exporters, access to finance as well as the power of middle men, brokers and exporters are found to be important constraints on the supply of exports (Alemayehu *et al*, 2009; Onjala and Otieno, 2009).

The *Ugandan* study shows that at macro level, export supply in Uganda is found to be constrained by level of investment, capacity utilization rate and real exchange rate. At micro or firm level productivity and the related issue of access to modern technology, high cost of inputs (both raw material and labor), high taxes and license fees, lack of finance and inconsistency in government policy, lack of marketing information and corruption, in the order of importance, are found to be the major constraints to total supply of both traditional and non-traditional exports. The major constraints in the non-tradition exports (fish and fish products) are found to be, in the order importance, competition from other firms in foreign market, lack of finance, high tariff and access to information in foreign market as well as access to and cost of imported inputs. For traditional exports (coffee) pests and related coffee disease, low price of coffee, lack of finance and poor infrastructure, in the order of importance, are found to be the major constraints to export supply (see Mwebaze *et al*, 2009).

Finally, although the result is based on preliminary work, export supply in Cote d'Ivoire and Congo are found to be constrained by real exchange rate at macro level, as well as level of investment and domestic GDP used as an indicator of domestic production capacity. In addition to these factors, export supply in Congo (which is oil and timber) is also found to be constraint by poor road and shortage and high cost of power (See. Seka *et al*, 2009; Samba *et al*, 2009).

In sum, as can be read from Table 11 that summarize the information above, the traditional exports in the case study countries may grow and prosper through appropriate macro policy, in particular exchange rate policy, followed by enhancing investment and improving infrastructure, especially roads. Similarly, the non-traditional export growth may be achieved, in addition to having appropriate macro and trade policy, through improvement in infrastructure (such as road) and, reliable supply of inputs at reasonable price that will, among other things, would raise the relative competitive position of exporting farms and firms (see Table 11).

Table 11: Summary of Major Supply Side Determinants/Constraint of African Exports

<i>Case Study Countries</i>	<i>Traditional Exports</i>			<i>Non-traditional Exports</i>		
	The Top Major Constraint	The 2 nd Major Constraint	The 3 rd Major Constraint	The Major Constraint	The 2 nd Major Constraint	The 3 rd Major Constraint
Congo	Real Exchange Rate	Investment	Poor Road	same	Same	Same
Cote d'Ivoire	Real Exchange Rate	Investment	Poor Road	same	Same	Same
Ethiopia	Real Exchange Rate	Income of trading partners	Investment	Poor Road	Power	High Cost of inputs
Ghana	Real Exchange Rate	Income of trading partners	Macro & Trade Policy	Competition in foreign market	Demand for Exports	High Cost of inputs
Kenya	Real Exchange Rate	Income of trading partners	Investment	Poor Road	Power	High Cost of inputs
Sudan	Real Exchange Rate	High Cost of inputs	Old Equipment	Possible Dutch Disease Effect		
Uganda	Disease	Real Exchange Rate	Finance	Competition in foreign market	Finance	High tariff in foreign market

Source: AERC Interim Reports on Export Supply Constraint Studies (2009)

1. Conclusion and Policy Implications

In this chapter an attempt to examine the nature of the potential for intra-Africa trade as well as the prospect for advancing regional economic integration is made. A variety of methods are deployed for the purpose. The analysis suggest that although the result form a gravity model suggest the existence of a potential for intra-Africa trade, realizing this potential and hence the effort to advance regional integration through intra-Africa trade is challenged by highly limited similarity of exports and imports as well as the relative competitive position of African suppliers. This is the result of weak infrastructural basis, weak productivity and weak trade facilitation - in short acute supply constraint - that characterized the African trade.

This calls for a new and different approach for enhancing intra-Africa trade and furthering regional integration as the issue is fundamentally about addressing the challenge of supply constraint and competitiveness of African exports and their diversification. One fundamental policy direction in this regard is to go beyond liberalization to actual creation of the potential for trade through provision of infrastructure, enabling macro and institutional environment, as well as trade facilitation and diversification plan. This effort may be problematic as most African countries do find themselves at different level of development and with limited resources.

Variable geometry which allows some groups to move faster than the others could be usefully employed to address this latter problem (see Oyejide, 2000). These may take a new cooperation framework where responsibilities may be allocated across regions and countries. This will be important to address the major constraints of intra-Africa trade and regional integration effort – physical infrastructure and production capacity– which will enhance the competitiveness of countries in Africa through lowering transaction costs (Oyejide, 2000) and raising supply. Thus, investing on physical infrastructure (transport and communication in particular) across African countries is an important policy direction for both national and regional/continental organizations.

In addition, as regulation, doing business and trade facilitation are found in many countries as part of the major constraints to intra-Africa trade, regional integration schemes may need be directed to address these challenges through incorporating the responsibility of covering regulatory policies that foster integration and intra-Africa trade. Regional integration schemes may also need to cover cooperation on multi country infrastructure as well as policy coordination, as the latter determines optimal use of infrastructure investment. In particular, with regard to trade facilitation, there is a need to facilitate efficient service in core-infrastructure-related services such as finance, telecommunication, energy and transportation (Njinkeu and Fosso, 2006). As the issue in intra-Africa trade is realizing the potential by addressing the challenges of diversification and competitiveness, such investments would be crucial.

Both advances in regional integration and intra-Africa trade growth are conditional on other important policies to be carried by individual or group of countries. Rdorick (2006, cited in Biggs, 2007) for instance noted that Bangladesh's relative factor endowments are similar to that of China – abundant labour and scarce human and physical capital. But China has an export bundle that is 50 percent more sophisticated than Bangladesh, a difference that must have a lot to do with policy. China has made determined effort to transfer technology into the country and to diversify exports and Bangladesh has not. China, Vietnam and India have successfully integrated their economies in the world market not through open liberalization but by identifying and promoting exports and diversification that best suited their initial condition, political economy and institutional constraint (Biggs, 2007). Similarly, Africa's policy towards regional integration and intra-Africa trade need not be one-fits-all policy prescription. It should be tailor made that suits both different regions and individual countries. Such policy also needs to take diversification as central issue as lack of export-import similarity is one of the major hindrances to intra-Africa trade and advances in regional integration.

Finally, notwithstanding the proximate cause of lack of progress on regional integration and intra-Africa trade such as lack of adequate liberalization and trade facilitation as we noted above, deeper determinants of progress are related to issues of geography, incentives, capability, infrastructure and institutions and initial

conditions (Biggs, 2007). A sustainable solution need to address these problems in a medium to long term. This needs to be carried in a phased and coordinated fashion at national, regional and continental level. It is high time that African governments move fast from liberalization to (regional) planning or an 'outline of the policy and institutional framework' for actual capacity creation for enhancing intra-Africa trade and further progress on regional integration as the existing potential is challenged by lack of diversification and constraints on supply side that limit competitiveness.

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Appendix I

Brief Overview of the Methodology of the Gravity Model

The Gravity Model Specification and Estimation Procedure

The gravity model has widely been used to identify determinants of bilateral trade, though they are often criticized for lacking a strong theoretical basis. As Cernat (2001) noted, despite its use in many early studies of international trade, the model was considered suspect in that it could not easily be shown to be consistent with the dominant Heckscher-Ohlin model explaining net trade flows in terms of differential factor endowments (Cernat, 2001). However, Anderson (1979), Bergstrand (1985), Deardorff (1998), and Feenstra, Markusen and Rose (1998) have each developed some theoretical foundations to formally derive the model. In a typical gravity model, bilateral trade flows are determined by the size of the two economies and the distance between them. However, it is always possible to expand the model to include other relevant determinants of trade. The following standard gravity model is specified and estimated to examine the potential for intra-Africa trade in this study:

$$T_{ij} = \beta_0 + \beta_1(Y_i Y_j) + \beta_2[(YC_i YC_j)] + \beta_3 Dist_{ij} + \beta_4 (Area_i Area_j) + \beta_5 |YC_i - YC_j| + \left[\beta_i \sum Z_i + \beta_j \sum Z_j \right]$$

Where: T is bilateral trade between country i and j; Y is GDP; YC is GDP per capita and Z_i and Z_j are other relevant variables grouped under 'Infrastructure' (Paved road length as Percent of total, number of mobile telephone per 1000 people), policy (FDI in reporting countries, Tax on international trade in partner country), 'Cultural and geographic' (distance between the capitals of the trading countries, common official language, sharing border, being landlocked) and membership in regional groupings (UMA, COMESA, SADEC AND ECOWAS).

Expected Signs: β_1 and β_2 are expected to be Positive; β_3 , β_4 and β_5 are expected to be negative. Infrastructure variables, sharing border and common official language, membership to a particular REC as well as FDI are expected to be positive, while being landlocked is expected to be negative.

This model is estimated using bilateral export data of African countries. The censored nature of such regional bilateral trade implies that OLS estimates are biased. Thus, the model is estimated using a Tobit formulation (see Longo and Sekkat 2001, Elbadawi, 1997, Forotutan and Prichett, 1993; Alemayehu and Haile, 2008). The parameters of the model are, thus, computed by finding the estimates that maximize the likelihood function in the Tobit formulation. An experiment of other estimations techniques such as fixed-effect and random-effect model did not change the result reported. Neither the use of lagged GDP

and FDI to address possibly endogeneity has brought about different results. Hence, the tobit based result is used in the main text of this chapter.

Source of Data: The trade data is taken from IMF's Direction of Trade Statistics; Macro Indicators are taken from the World Bank's World Development Indicators as well as African Development Indicators. The data for FDI is obtained from the web site of UNCTAD. The relevant data for each African country and its trading partner is compiled for all countries listed in Appendix I(b) below.

Appendix I(b) (Sample of Countries used in the Gravity Model)

African Countries (Both reporter and partners)		Non-Africa Trading Partners	
		Europe and North America	Asia and Latin America
Algeria	Madagascar	Austria	Latin America
Angola	Malawi	Belgium and Luxembourg	Argentina
Benin	Mali	Canada	Bolivia
Botswana	Mauritania	Denmark	Brazil
Burkina Faso	Mauritius	Finland	Chile
Burundi	Morocco	France	Mexico
Cameroon	Mozambique	Germany	Colombia
Cape Verde	Namibia	Greece	
Central African Republic	Niger	Iceland	Asia Pacific
Chad	Nigeria	Ireland	Australia
Comoros	Rwanda	Luxembourg	China
Congo	Sao Tome and Principe	Italy	Hong Kong
Congo (Democratic Republic of the)	Senegal	Netherlands	India
Côte d'Ivoire	Seychelles	Norway	Indonesia
Djibouti	Sierra Leone	Portugal	Israel
Egypt	Somalia	Spain	Japan
Equatorial Guinea	South Africa	Sweden	Malaysia
Eritrea	Sudan	Switzerland	New Zealand
Ethiopia	Swaziland	United Kingdom	Saudi Arabia
Gabon	Tanzania, United Rep. of	United States of America	Singapore
Gambia	Togo	Other Europe	Turkey
Ghana	Tunisia	Bulgaria	
Guinea	Uganda	Czech Republic	
Guinea-Bissau	Zambia	Croatia	
Kenya		Hungary	
Lesotho		Poland	
Liberia		Russian Federation	
Libyan Arab Jamahiriya		Ukraine	

Appendix II

Brief Overview of the Methodology for Computing Export Similarity Indices for Africa

The Import-Export Similarity Index

As part of the quest to understand the potential for intra-Africa trade, the export similarity index approach originally developed by van Beers and Linnemann (1988) and used successfully by Oramah and Abou-Lehaf (1998) on African data is used. The import-export similarity index as proposed by van Beers and Linnemann (1988), are the following two indices, labeled Cosign (COS) and EIS. Taking i and j for exporting and importing countries, respectively, these indices take the form in equation [1] and [2] .

$$COS_{ij} = \frac{\sum_k E_{ik} M_{jk}}{\sqrt{\sum_k E_{ik}^2 \sum_k M_{jk}^2}} \quad [1]$$

$$EIS_{ij} = \sum_k \text{Min} \left\{ \frac{E_{ik}}{\sum_k E_{ik}}; \frac{M_{jk}}{\sum_k M_{jk}} \right\} \quad [2]$$

Where E_{ik} - Exports of country i in commodity class k
 M_{jk} - Imports of country j in commodity class k
 k - Commodity class 1,...,n

Both measures of import-export correspondence index, COS and EIS, vary between zero (no correspondence between the export of country i and the import of country j) and one (perfect similarity). COS is the cosine of the angle between the vectors of country i exports and the vector of country j imports in an n -dimensional commodity space. The related equation EIS, given as an equation [2], is the sum over all commodity classes of the share of commodity class k in country i exports or in country j imports - whichever of these two shares is the lower, so that only the 'overlap' counts (see van Beers and Linnemann, 1988). The measures are sensitive to the level of aggregation; generally increasing the number of commodity classes, n , will tend to lower the numerical value of the measures. To avoid this problem, only five of the best import and export commodities of all African countries, for which data is available for the year 2007 from UNComtrade is used. The other property of COS worth noting is that because of its non-linear nature it may assume a higher value, compared to EIS, when there is a high concentration of tradable commodities [If one , that has the lion's share, among the top five exports of country A is similar with one of the imports which is also the lion's share of country B import, then the COS_{AB} will be high even if the other exports of country A are entirely different from the imports of country B]. However, COS is normally preferred in the literature and hence used in this chapter.

A measure of export-import similarity may be interpreted as a variable reflecting the expected intensity of a bilateral trade flow from exporting country i to importing country j . The similarity of exports and imports of all class of commodities is, however, one of the determinants of trade intensity between two countries. The term 'intensity' is used in van Beers and Linnemann (1988) interpretation to indicate that the analysis abstracts from the economic size of trade partners as reflected in the total volume or value of their exports and imports; the latter are seen as scale factors with which the 'intensity' has to be multiplied in order to arrive at observed or potential trade flow magnitudes.

LIST OF IAES WORKING PAPERS

No	Authors	Title	No and Year
		2011	
1	Alemayehu Geda and Kibrom Tafere	The Galloping Inflation in Ethiopia: A Cautionary Tale for Aspiring 'Developmental States' in Africa	WP A01_2011
2	Alemayehu Geda, Kibrom Tafere and Melekt Amedu	Remittance and Remittance Service Providers in Ethiopia	WP A02_2011
3	Alemayehu Geda and Abrham Abebe	A Dynamic Modelling of Gebre-Hiwot Ideas: Of Early 20 th Century Ethiopia's Development Problems	WP A03_2011
4	Alemayehu Geda and Atenafu G. Meskel	Impact of China-Africa Investment Relations: Case Study of Ethiopia	WP A04_2011
5	Alemayehu Geda	Economic Ideas of Gebre-Hiwot Baykadagn (A great early 20th[1924] century thinkers, in AMHARIC)	WP A05_2011
6	Alemayehu Geda and Idris Hussein	The Potential for Intra-Africa Trade and The Supply and Demand Constraints for its Realization	WP A06_2011