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**Creating African Futures in an Era of Global Transformations:**

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**Desafios e Perspetivas**

**بعث أفريقيا الغد في سياق التحولات المعولمة :**

**رهانات و آفاق**

**Assessing the Success of Regional Trade Integration in Africa: a Comparative  
Analysis with non-African Trade Blocs**

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## **Abstract**

This paper assesses the performance of intra-COMESA and SADC trade integration compared to success of the non-African trade blocs namely, ASEAN and MERCOSUR. The analysis used a gravity approach to estimate the coefficients of ASEAN and ASEAN models which are used as a benchmark to project the potential trade for COMESA and SADC members. The results revealed that the actual intra-trade of all members of COMESA and SADC are far from their potential trade level, implying unfavorable performance of the African regional trade integration compared to non-African trade blocs. The results also indicated that Kenya and South Africa are the most successful members in COMESA and SADC integration, respectively. Finally, the paper ends with some policy recommendations regarding promoting regional cooperation in Africa.

## **1. Introduction**

Regional integration has been an interesting policy issue that received a considerable attention from policy makers in developed and developing countries. In Africa, the initiatives for regional integration have started in the early of the last century. Particularly, after independence, African countries witnessed establishment of a number of Regional Trade Agreements (RTAs). Despite of the diligent efforts to stimulate the economic cooperation in the African continent, the outcome of these efforts is still far from the expectations. According to the Economic Commission for Africa (2010), the situation of intra-African trade, is disappointing, since it remains consistently low compared with the continent's external trade. The recent statistics show that more than 80% of Africa' exports go to external markets, while African countries import more than 90% of their imports from outside of the continent (WTO, 2011).

The Common Market for East and Southern Africa (COMESA) and Southern African Development Community (SADC) are the most prominent regional blocs in Africa. They paid a considerable attention to cooperation in productive sectors such as, infrastructure, agriculture, transportation and financial sector. In the last decade, the leaders of such blocs have launched many regional cooperation arrangements, including Free Trade Areas (FTAs) as well as custom unions. Furthermore, the aspiration of the leaders is to push the cooperation process toward a Common Market and economic community in the coming decade. Having these ambitious plans for further trade cooperation, it is important to assess the success of COMESA and SADC regional trade agreements in comparison with other successful trade agreements in developing regions like Asia and Latin America. Indeed, there are many successful RTAs in developing world like Association of South East Asian Nations (ASEAN) in Asia and southern cone common market (MERCOSUR) in Latin America which they can be used as a benchmark to evaluate the African RTAs. Therefore, this paper aims at assessing the performance of COMESA and SADC on the basis of success of ASEAN and MERCOSUR integration. This would be useful to gauge the prospect of African trade integration for further trade arrangements and to uncover some policies that can help Africa



policy makers to develop the process of integration so as to achieve more cooperation. The ASEAN and MERCOSUR are selected, because they are most successful RTAs in developing regions (i.e. Asia and Latin America).

The contribution of this paper is to fill a gap in the literature on assessing regional agreements in Africa based on the success of other non-African blocs. In addition, unlike the previous studies on measuring trade potential, this study uses “out-of-sample” approach, which allow to analyze the potential intra-trade of any trade bloc relative to the success of other regional trade body. The analysis uses a gravity model for samples of members selected from ASEAN and MERCOSUR over the period 1995-2011. The estimated coefficients of the gravity equations are applied to both COMESA and SADC trade models to calculate the potential trade. Then, the performance of each trade bloc will be measured by the ratio of potential to actual trade.

The remainder of this paper will be organized as follows. The next section discusses some stylized facts about regional integration in Africa and other developing regions, focusing on the four regional blocs under consideration. Section three reviews the empirical literature on regional integration and trade potential. While section four outlines the research methodology, section five presents the empirical results. Finally, section six ends with conclusion and policy implications.

## **2. Some Stylized Facts about COMESA, SADC, ASEAN and MERCOSUR Integration**

Before analyzing the performance COMESA and SADC on the basis of success of ASEAN and MERCOSUR, it is useful to describe the features of these arrangements. Thus, this section outlines the main characteristics of the four agreements, focusing on their memberships, objectives and economic size as well as their regional trade patterns.

### **2.1 COMESA Regional Integration**

COMESA started as a preferential trade area (PTA) in 1982 and extended in 1994 to be one of the prominent regional integration bodies in eastern and southern Africa. COMESA now embodies 19 members including Angola, Burundi, Comoros, the Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Seychelles, Sudan, Rwanda, Swaziland, Uganda, Zambia and Zimbabwe. The main aim of COMESA is to strengthen the process of regional economic integration, which had been initiated in order to help member states to achieve sustainable economic growth.

In 2000, the members of COMESA signed the Free Trade Area (FTA) agreement, to attain sustainable growth of the member states, to promote joint development in all fields of economic activity, to cooperate in the creation of productive environment for foreign, Cross-border and domestic investment and in the promotion of peace, security, and stability among the member states in order to enhance the economic development in the region (COMESA, 2013). In the recent decade, the COMESA agreement witnessed the adoption of many trade



arrangements with respect to all trade sectors. In 2009 the agreement had launched the custom union, which expected to be extended to economic and currency union in the coming decade (Sawkut and Boopen, 2010).

Regarding the economic and trade performance, Table 1 presents some basic indicators about COMESA integration. The Table reveals that the COMESA region contains about 456 million inhabitants which vary widely from country to country, ranging from less than 90,000 in the Seychelles to 87 million in Ethiopia. The level of economic situation measured by GDP per capita also varies from one country to another, implying the high income disparity among COMESA countries as indicated in some empirical studies (e.g. Ben Hammouda et al., 2009). For some members like Sudan and Zambia the per capita income has increased at a rate of more than 200 per cent during the period 2000–2010. On the other hand, while some countries like Congo and Burundi exhibit low levels of GDP per capita, others like Libya and Seychelles reported high levels of GDP per capita.

**Table 1: COMESA Regional Integration, Selected Indicators, 2000 - 2010**

Member State	Population (million)	GDP per capita (USD)		Intra-COMESA Exports- in USD million		Intra-COMESA Imports- in USD million		Share in COMESA Total trade (%)	
		2000	2010	2000	2010	2000	2010	2000	2010
Burundi	9.23	130.42	219.53	5.01	24.57	19.92	105.87	0.80	0.75
Comoros	20.62	583.09	1090.38	0.10	2.45	5.03	13.01	0.16	0.09
Congo	62.19	91.70	210.77	33.69	1134.3	107.12	806.13	4.52	11.17
Djibouti	0.83	762.54	1353.19	4.08	601.73	73.43	78.15	2.49	3.91
Egypt	78.08	1509.58	2803.53	113.79	2343.67	239.08	961.77	<b>11.32</b>	<b>19.02</b>
Eritrea	5.74	179.31	368.75	0.18	2.14	7.80	155.54	0.26	0.91
Ethiopia	87.10	123.89	341.08	155.14	287.30	107.58	286.24	8.43	3.30
Kenya	40.91	406.12	787.06	595.65	1658.40	77.33	504.09	<b>21.60</b>	<b>12.44</b>
Libya	6.04	6548.57	10455.57	50.41	334.78	69.29	1378.27	3.84	9.86
Madagascar	21.08	246.28	419.22	19.06	47.09	63.47	197.27	2.65	1.41





Malawi	15.01	154.00	359.58	41.51	215.56	52.78	231.83	3.03	2.57
Mauritius	1.28	3861.04	7586.97	96.82	155.74	58.30	125.31	4.98	1.62
Rwanda	10.84	206.65	519.02	35.07	82.73	28.65	415.23	2.04	2.87
Seychelles	0.09	7578.83	10842.57	2.39	2.46	12.52	46.98	0.48	0.28
Sudan	35.65	356.50	1421.09	78.71	336.49	201.21	767.93	8.98	6.36
Swaziland	1.19	1433.18	3093.54	64.98	140.25	0.53	10.67	2.10	0.87
Uganda	33.99	255.12	505.99	77.07	712.98	152.36	586.94	7.36	7.48
Zambia	13.22	322.10	1224.95	152.13	690.18	85.26	1394.23	7.62	12.00
Zimbabwe	13.08	535.04	568.43	170.72	266.96	57.70	271.20	7.33	3.10
COMESA	456.17	25283.9	44171.24	1696.5	9039.83	1419.35	8336.63	100.00	100.00

Source: Authors' calculations based on data from World Bank Indicators and websites of COMESA ([comstat.comesa.int/DataQuery.aspx](http://comstat.comesa.int/DataQuery.aspx)).

In accordance with regional trade performance, Table 1 also indicates that COMESA has undergone a sizeable increase in the intra-regional exports and imports between 2000 and 2010. In 2010 the intra-exports of some countries like Egypt and Kenya were very high, while other countries are far lower. For example, the intra-COMESA exports performance for Comoros, Eritrea and Seychelles did not exceed \$2.5 million. The share of Egyptian exports to other COMESA members has increased from \$113.8 million in 2000 to \$2343.7 million in 2010, reporting the highest rate in COMESA. Kenya also reported a notable increase in intra-COMESA exports from about \$595.7 million to \$1658.4 million in 2010. Overall, Egypt and Kenya were active trading partners amongst COMESA states, as their contribution to total trade in 2010 accounted for 19 per cent and 12.4 per cent, respectively. On the other hand, Libya and Zambia were the highest importing countries within COMESA. Furthermore, the increase of both exports and imports for all countries between 2000 and 2010 suggests that the creation of the FTA in 2000 led to notable improvement in intra-COMESA trade.

## 2.2 SADC Regional Integration

The Southern African Development Community (SADC) is made up of fourteen members including Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Seychelles has withdrawn its membership but Madagascar was awarded “candidate membership status” at the 2004 Summit in Mauritius. Before the formation of the SADC in 1992, formerly known as the Southern African Development Coordination Conference (SADCC) which was established in 1980, aims to strengthen socio-economic cooperation and integration as well as



political and security cooperation of southern African states. The main objectives of SADC comprise achieving development and economic growth, peace and security, to alleviate poverty, enhance the standard and quality of life of the peoples of Southern Africa, and support the socially disadvantaged through regional integration, built on democratic principles and equitable and sustainable development (SADC, 2014). The SADC regional integration program includes the establishment of the FTA by 2008, which involves the elimination of tariffs and non-tariff barriers, a Customs Union by 2010, a Common Market by 2015 and later a monetary union and a single currency. The free trade area in SADC was launched on time in 2008, with all member states (except Seychelles, Angola and Democratic Republic of Congo), removing tariffs on 85% of their products.

Table 2 below shows that SADC is considered as the third populous region in our study, after ASEAN and COMESA, with a total population of over 272 million in 2010. In 2010, the total regional GDP per capita for SADC was USD 50224.47. The highest GDP per capita for SADC member was Seychelles (USD 10842.77), followed by Mauritius (USD 7586.97) and South Africa (USD 7175.62). On the other hand, some countries like Congo, Malawi and Mozambique display low levels of GDP per capita.

**Table 2: SADC Regional Integration, Selected Indicators, 2000 - 2010**

Member State	Population (million)	GDP per capita (USD)		Intra- SADC Exports- in USD million		Intra- SADC Imports- in USD million		Share in Total SADC trade (%)	
		2000	2010	2000	2010	2000	2010	2000	2010
Angola	19.55	655.63	4218.65	10.64	2331.38	330.79	1245.37	13.49	23.64
Botswana	1.97	3297.48	6980.36	320.41	897.55	6	4262.20	5.51	3.28
Congo, Dem	62.19	406.57	330.00	12.45	1180.09	197.30	1596.65	3.26	3.53
Lesotho	2.01	415.47	1083.01	1.07	11.25	1.24	12.05	0.32	0.31
Madagascar	21.08	246.28	412.96	26.10	61.65	96.60	297.86	2.13	1.17
Malawi	15.01	154.00	359.58	58.41	203.86	231.90	907.07	0.87	1.00
Mauritius	1.28	3861.04	7586.97	102.78	283.53	363.96	456.49	4.12	2.12
Mozambique	23.97	235.84	386.96	54.71	614.90	329.20	2200.63	1.34	1.93



						1244.8			
Namibia	2.18	2059.40	5113.16	436.29	1759.28	6	3490.46	3.15	3.15
Seychelles	0.09	7578.83	10842.77	6.03	1.55	45.94	109.02	0.53	0.30
				2967.4					
South Africa	50.90	3019.95	7175.62	4	8391.86	335.96	3693.06	<b>54.45</b>	<b>47.81</b>
						1000.5			
Swaziland	1.19	1433.18	3261.59	612.18	1163.58	5	1541.21	2.05	1.08
Tanzania	44.97	308.14	524.69	52.56	780.57	197.30	945.00	2.51	3.78
Zambia	13.22	322.10	1224.95	264.85	1315.51	650.15	3296.75	2.09	3.95
				1317.1		1283.2			
Zimbabwe	13.08	535.04	723.16	1	2283.80	2	3446.17	4.18	2.94
		<b>24528.9</b>	<b>50224.4</b>	<b>6243.0</b>		<b>7924.9</b>	<b>27499.9</b>		
<b>SADC</b>	<b>272.68</b>	<b>4</b>	<b>7</b>	<b>4</b>	<b>21280.38</b>	<b>4</b>	<b>8</b>	<b>100.00</b>	<b>100.00</b>

Source: Authors' calculations based on data from World Bank Indicators and websites of SADC (<http://www.sadc.int/about-sadc>).

The figures of intra-regional exports and imports show that South Africa has the highest share of trade to SADC with contribution to total trade in 2000 and 2010 accounted for 54.45% and 47.81%, respectively. On the other hand, the contribution of the other countries is very low, except Angola takes up the second highest share of trade in SADC after South Africa with contribution of 23.64% in 2010. Indeed, the importance of South Africa in intra-SADC trade results from its comparative advantage in the production of high value-added goods as well as its geographical location in SADC region.

### 2.3 ASEAN Regional Integration

The Association of Southeast Asian Nations (ASEAN) was established in 1967, to accelerate economic growth, social progress and cultural development in the region. The association also pays attention to peace and stability through justice amongst its member nations, and promotes active collaboration and mutual assistance on matters of common interest in the economic, social, cultural, technical, scientific and administrative fields. The founding countries of ASEAN are Indonesia, Malaysia, Philippines, Singapore and Thailand. Brunei Darussalam joined in 1984, Vietnam in 1995, Laos PDR, Myanmar in 1997 and Cambodia in 1999, making up what is today the ten member states of ASEAN (ASEAN Secretariat, 2013).

ASEAN has adopted many trade arrangements which resulted in remarkable progress in intra-trade performance over the last decades (see Table 3). For example, the ASEAN Free Trade



Area (AFTA) was signed in January 1992 with the aim of creating a free trade area by 2008. AFTA original signatories were Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand. Vietnam joined in 1995, Laos and Myanmar in 1997 and Cambodia in 1999. This free market trade means that all ASEAN goods can be traded to member states markets with a minimum tariff or without any tariff (ASEAN Secretariat, 2013).

Table 3 shows that the ten members of ASEAN have growing economies with a population of about 593 million. We notice that the levels of development in the two years considered are very different across these countries. The Table shows that the last four countries joining ASEAN (Cambodia, Laos, Myanmar and Vietnam) have a lower stage in economic development than the other six members. It is interesting to note that for ASEAN countries there is a large disparity between the shares of intra-regional exports and intra-regional imports. For example, Singapore was the first, followed by Malaysia and Thailand. For some countries like Lao PDR and Cambodia, the intra-regional trade is very low. In addition, the share of Singapore in total trade within ASEAN reporting the highest rate (34 per cent).

**Table 3: ASEAN Regional Integration, Selected Indicators, 2000 - 2010**

Member State	Population (million)	GDP per capita (USD)		Intra-ASEAN Imports- in USD million	Intra-ASEAN Imports- in USD million	Share in Total ASEAN trade (%)
	2010	2000	2010	2010	2010	2010
Brunei	0.40	18086.60	29915.3	8,615.4	2,383.8	0.54
Cambodia	14.36	298.95	785.1	5,583.6	4,896.8	0.51
Indonesia	240.68	789.81	3027.2	157,779.1	135,663.3	14.34
Lao PDR	6.40	321.29	1099.9	2,432.8	2,076.4	0.22
Malaysia	28.28	4004.56	8555.5	198,800.8	164,733.5	17.77
Myanmar	51.93	268.432	706.4	7,599.5	4,198.7	0.58
Philippines	93.44	1043.46	2129.4	51,431.7	58,228.6	5.36
Singapore	5.08	23814.56	44862.8	371,194.3	328,078.9	<b>34.18</b>
Thailand	66.40	1968.54	4743.3	195,312.3	189,728.4	18.82
Viet Nam	86.93	401.55	1225.5	72,191.9	84,801.2	7.67
<b>ASEAN</b>	<b>593.90</b>	<b>50997.74</b>	<b>3152.8</b>	<b>1,070,941.4</b>	<b>974,789.6</b>	<b>100.00</b>





Source: ASEAN Finance and Macro-economic Surveillance Unit Database, websites of ASEAN Member States' national statistics offices and World Bank Indicators.

## 2.4. MERCOSUR Regional Integration

In March 1991, Argentina, Brazil, Paraguay, and Uruguay agreed to form a customs union called the Mercado Común del Sur, or Southern Common Market. The union commonly known as MERCOSUR created an integrated regional market whose members were committed to liberalize trade with one another while imposing a common tariff on goods imported from non-members. The main objective of MERCOSUR is to facilitate the free movement of goods, capital, services, and people among its member states, (Connolly and Gunther, 1999).

Table 4 reveals that the population of MERCOSUR is estimated at 245 million, Brazil is one of the 10 largest countries in the world so that it is a dominant country within MERCOSUR in terms of population. However, the Table clearly shows that Brazil has a lower GDP per capita than Argentina and Uruguay. In 2010 the intra exports of Brazil and Argentina are very high, while the intra-exports of the rest of countries are far lower. The Table also indicates that Argentina's and Brazil's share of total imports originating in MERCOSUR countries has been increased, as their contribution to total trade in 2010 accounted for 40.89% and 45.53%, respectively and much more dependent on MERCOSUR for their imports than Uruguay and Paraguay.

**Table 4: MERCOSUR Regional Integration, Selected Indicators, 2000 - 2010**

Member State	Population (million)	GDP per capita (USD)		Intra-Exports- in USD million		MERC Intra-Imports- in USD million		Share in Total MERC trade (%)	
	2010	2000	2010	2000	2010	2000	2010	2000	2010
Argentina	40.37	9329.11	11460.38	8410.55	16977.30	6735.34	19653.49	42.48	40.98
Brazil	195.21	3694.46	10978.26	7843.87	22601.50	7857.39	18092.18	44.03	45.53
Paraguay	6.46	1531.89	3100.84	551.54	2818.17	1509.38	3826.96	5.78	7.44
Uruguay	3.37	6872.73	11530.64	1022.69	2291.09	1726.55	3115.45	7.71	6.05
<b>MERCOSUR</b>	<b>245.42</b>	<b>21428.19</b>	<b>37070.12</b>	<b>17828.65</b>	<b>44688.06</b>	<b>17828.67</b>	<b>44688.08</b>	<b>100.0</b>	<b>100.0</b>
								<b>0</b>	<b>0</b>

Source: Authors' calculations based on data from World Bank Indicators.



### **3. Literature Review**

Concerning the importance of regional arrangements in trade performance and economic prosperity, a huge body of literature on examining the performance of intra-trade of regional trade arrangements has grown in the last decades. However, there is a dearth on studies on the performance of African trade blocs and most of empirical literature focused on advanced and transitional regions. In the last decade, few empirical studies on African trade integration have been emerged (e.g. Chauvin and Gaulier (2001); Khandelwal (2004) and Ebaidalla and Yahia (2013)).

For instance, Pastore et al. (2009) studied the trade performance of EU members with the Mediterranean (MED) countries and the new EU members using a gravity model of intra-EU trade including thirteen members over the period 1995-2002. Employing an out of sample methodology, they report that there is a substantial unexploited trade potential with both groups of partners, but the ratio of potential to actual trade with the MED countries is much larger more dispersed and stable compared to that with the new EU members. The authors also found that the potential trade tends to converge to actual trade in a much longer time in the case of MED countries.

Stack and Pentecost (2011) employed a gravity model of new trade theory determinants for a twenty OECD trading partners with EU countries during the period 1992-2003. Based on an out-of-sample approach they project the potential trade for ten new member states and ten associated countries. They revealed that the projected trade ratios for the ten new member states are multiples of actual 2003 levels, indicating that trade expansion between these countries will tend to expand in the future. On the other hand, for the Mediterranean countries the ratio of potential to actual trade is found to be near unity value, implying fewer opportunities for further trade integration with the EU.

Al-Atrash and Yousef (2000) investigated the trade performance of 18 Arab countries with 43 trading partners that represent over 90 percent of the exports and imports of the Arab world. Using a gravity model, they found that the intra-trade within the Arab subgroups is higher than overall intra-Arab trade. The authors also found that cultural attributes measured by language have mixed effect: while English-speaking countries tend to trade more with each other, the French-speaking countries are not statistically significant. Moreover, they pointed out that ASEAN preference arrangement exert large positive effect on intra-Arab trade, while the EU arrangements decrease the volume of trade among Arab countries.

For the case of Africa, Chauvin and Gaulier (2002) measured the potential of intra-SADC trade, using three complementary approaches: export diversification index, revealed comparative advantages and trade complementarity indices as well as gravity model approach. They found that there is some complementarity between SADC countries; but their evidence does not confirm the existence of potential trade among the bloc members.



Moreover, South Africa is found to be the most significant member in terms of exports and can play an important role in fostering the intra-trade in the SADC region.

In the same vein, Khandelwal (2004) studied the prospects and challenges for trade expansion in COMESA and the South African Development Community (SADC). He argued that the COMESA FTA has taken a market-liberalization approach to regional integration, but has been hampered by country-level implementation issues. On the other hand, SADC has taken the approach of addressing infrastructure and supply constraints but also suffered from implementation problems. Khandelwal also found that possibilities of growth in intra-regional trade may be limited, but that the two arrangements provide opportunities for their member states to adopt policy credibility for trade reforms and trade liberalization and to address structural problems.

Simwaka (2011) assessed the success of SADC FTA over the period 1998-2007. He separated the data sample into two periods; pre-integration (before the adoption of FTA 1998-2000) and post-integration (after SADC FTA came into operation 2003-2007). Using a gravity model, he found that the predicted trade is higher than the observed intra-regional trade, suggesting an existence of trade potential among SADC members. Simwaka concluded that SADC FTA leads to trade creation and enhance the trade capabilities of member countries. His results, however contradicts the findings of Chauvin (2002), who found that SADC trade potentials are rather small or negative, especially for South African exports. Finally, comparing SADC with other regional integrations, the author argued that ASEAN and NAFTA perform better than SADC.

Recently, Ebaidalla and Yahia (2013) assessed the performance of intra-COMESA trade integration on the basis of success of ASEAN integration. Using an out-of-sample approach and employing gravity approach. They pointed out that all countries of the selected sample are far from their potential trade level, implying unfavorable performance of the regional trade integration among COMESA members. Their results also indicate that the gap between potential and actual trade has been decreased in last decade, suggesting a convergence toward the potential trade level over time<sup>1</sup>.

#### **4. Methodology and Data**

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<sup>1</sup> The paper of Ebaidalla and Yahia (2013) assessed the performance of COMESA relative to only ASEAN. While the current study examine the COMESA and SADC on the basis of success of two trade blocs: ASEAN and MERCOSUR. Thus, this study has an advantage of comparing COMESA with SADC relative to the performance of non-African trade integration.



To examine the performance of intra-trade of COMESA and SADC on the basis of success of ASEAN and MERCOSUR integration, the analysis proceeds via two steps: first, we estimate the coefficients of the gravity model of both intra-ASEAN and intra-MERCOSUR trade, and then apply them into equations of intra-trade between the selected members of COMESA and SADC to calculate the potential trade relative to non-African blocs. The calculated potential trade volume will be compared with the actual volume of intra-trade.

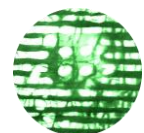
#### 4.1. Model Specification

The gravity model of bilateral trade is widely used in the literature to investigate the determinants of bilateral trade flow. The gravity model was firstly used by Tinbergen (1962) and Linneman (1966) and later developed by (Anderson, 1979). In recent decades this model has been developed further and used extensively in the trade literature. Therefore, the paper employs the gravity model as a benchmark to compare between the African and non-African trade blocs under investigation.

The gravity model is based on Newton's gravity law in Physics, which assumes that there is a gravitational pull between two physical bodies as proportional to their mass and inversely proportional to their distance. This theory is analogous to the international trade as follows: the trade flow between two countries (exporter and importer) is proportional to the product of each country's (economic mass) commonly measured by GDP or population, divided by the distance between the country's respective centers of gravity. Thus, trade between two countries depends on their Gross Domestic Product (GDP), population size and the distance between them. Hence, the estimable gravity model that used in our analysis could be specified as follows:

$$\begin{aligned} \ln T_{ijt} = & \alpha_{ij} + \beta_1 \ln GDP_{it} + \beta_2 \ln POP_{it} + \beta_3 \ln GDP_{jt} + \beta_4 \ln POP_{jt} + \beta_5 \ln DIS_{ij} \\ & + \beta_6 CB_{ij} + \beta_7 CL_{ij} + \mu_{ijt} \quad (1) \end{aligned}$$

Where  $i$  indicates the exporter countries,  $j$  are the trading partners and  $t$  is period under consideration,  $T_{ij}$  is the volume of trade (exports + imports) variable between country  $i$  and country  $j$ ;  $POP_i$  and  $POP_j$  are the population at time  $t$  of country  $i$  and  $j$ , respectively;  $GDP_i$  and  $GDP_j$  are gross domestic product of country  $i$  and  $j$  at time  $t$ ;  $DIS_{ij}$  is the geographical distance in kilometers between the capital city of country  $i$  and of country  $j$ ;  $CL_{ij}$  is a dummy variable to capture common language or colonial history, taking value of 1 if the two countries speak same language or have ex-colony links, and zero otherwise.  $CB_{ij}$  is a dummy taking a value of one if the trade partners share a common land borders or sea borders, and zero otherwise; finally,  $\mu_{ijt}$  is the error term. All the variables are expressed in natural logarithms except dummy variables.



According to the theory, the coefficient of GDP is expected to be positive, as an increase of national income indicates more imports demand and exports supply. The impact of population size (POP) is mixed as suggested by most of previous empirical studies. Markheim (1994) argues that a country with large population size entails a large domestic market and high degree of self-sufficiency and less need to trade (absorption effect). Other argument show that, a large population means more progress in specialization and division of labour and increase of the production, which are generally associated with a larger need for trading (scale effect). The coefficient of distance is expected to be negative, as the larger physical distance between two countries' economic centers, the higher is the cost of transporting goods between them. Finally, the dummy variable CL and CB are expected to be positive, as sharing borders, ex-colony links, and same language indicates geographical closeness, better information, same cultures and institutions as well as legal systems.

## **4.2. Data Sources**

The data used in the gravity model concerning the two non-African blocs: ASEAN and MERCOSUR. The Data about ASEAN covers eight members over the period 1998-2010<sup>2</sup>. On the other hand, the data for MERCOSUR members covers four countries during the period 1995-2011<sup>3</sup>. The data concerning the selected members of COMESA and SADC spans for the period 2004-2010<sup>4</sup>. The trade data for ASEAN and MERCOSUR members were extracted from IMF' Direction of International Trade statistics, while the trade data for COMESA and SADC are collected from their web sites<sup>5</sup>. The data about current GDP and population size were obtained from World Bank's Development Indicators. Data on distance in kilometers between countries was calculated by <http://www.distancefromto.net/countries.php>. Finally, Information about common language, ex-colony history and common border were sourced from the CIA World Fact-book.

## **4.3. Estimation Methodology**

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<sup>2</sup> The analysis of intra-ASEAN includes: Brunei, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam. The remaining countries were excluded, because they joined ASEAN integration after 1998.

<sup>3</sup> The MERCOSUR sample includes the four founders of the treaty: Brazil, Argentina, Paraguay and Uruguay.

<sup>4</sup> Due to the lack of data on some members of COMESA and SAD, we select eight and nine countries from COMESA and SADC, respectively. See the list of countries used in the analysis in Annex I.

<sup>5</sup> COMESA statistics database (COMSTAT) (2014). <http://comstat.comesa.int/Home.aspx>

SADC statistics database (2014). <http://www.sadc.int/about-sadc>.





The gravity model in equation (1) for both ASEAN and MERCOSUR is estimated using the three panel data methods namely, pooled, fixed effects (FE) and random effects (RE) models. As our regression models involve individual effects, it is important to decide whether they are fixed or random; thus we focus on the fixed and random effects models. When estimating the trade flows between a randomly selected sample of trading partners from a large population a random effects is more appropriate, while the fixed effects model is better when estimating the flows of trade between an *ex ante* predetermined selection of countries (Egger, 2006). However, the Hausman test statistic is applied to check further whether the fixed effects model is more appropriate than the random effects model. If the null hypothesis of no correlation between the individual effects and regressors is rejected, then the fixed effects model is better than the random effects one.

Following Simwaka (2011) and Pastore *et al.* (2009), the gravity model estimators are used as a benchmark to assess the potential trade of COMESA and MERCOSUR regional integration. That is, to assess the performance of the two African trade blocs, the estimated coefficients of the gravity model relative to the intra-ASEAN and MERCOSUR trade model will be applied to a similar specification of intra-COMESA and SADC trade model. The success of intra-trade integration for both COMESA and SADC is measured by the ratio of potential to actual trade. As the projected potential trade is the amount of trade that would be achieved if the African trade blocs (i.e., COMESA and SADC) could achieve intra-regional trade integration similar to that of ASEAN and MERCOSUR. The ratio of potential trade to actual trade measures the success of intra-trade integration of African blocs relative to non-African trade integration. A ratio of one indicates that the potential trade equals actual trade, implying that the intra-trade of a certain trade bloc is at successful level compared to a specific non-African bloc. The higher is the ratio, the higher is the gap that needs to be filled by creation more trade. A ratio below one indicates that actual trade is close to its potential level.

### 5.1. Estimation of Gravity Model

Since we use the ASEAN and MERCOSUR trade arrangements as benchmark to assess the African trade blocs, the gravity model of equation (1) will be estimated for both ASEAN and MERCOSUR integration, using pooled, fixed effects and random effects models. First the results of gravity model for selected ASEAN members are presented in Table 5 below. The results in the second column of are those of the pooled panel data model. The shortcoming of this model is that it does not consider for heterogeneity of countries, and no country specific effects are estimated, hence assumes that all countries are homogenous in terms of cross-section and time. Columns three and five present the results of the fixed effects models which



take into account the heterogeneity by estimating country specific effects. To support the efficiency of fixed effects, the F-test was performed to check the poolability of the data<sup>6</sup>. The result of the F-test shows that the null hypothesis of equality of the individual effects is rejected, suggesting that a model with individual effects must be selected (i.e. fixed effects or random).

Finally, the results in columns 4 and 6 are those of the random effects model. The main advantage of random effects model is like fixed effects allows heterogeneity in the cross section, but it avoids the loss of degrees of freedom which occurs in fixed effects. To choose between the FE and the RE models, the Hausman test rejects the hypothesis that the coefficients of the FE models and the RE models are equal, suggesting that FE estimates are more consistent. However, one problem with a fixed effects model is that variables that do not change over time (e.g. distance, common border or common language) cannot be estimated directly because they are fixed effects and are therefore removed in estimates at the difference. Since both time varying and time invariant effects must be taken into account in gravity model, the analysis follow (Pastore et al., 2009) in relying on the RE models instead of FE model. Precisely, we rely on RE model of column 6 which takes into account all variables specified in the gravity model.

**Table 5: Results of Gravity model estimation for intra-ASEAN trade (1998-2010)**

<b>The dependent Variable is the total trade (exports +imports, in US\$)</b>					
<b>Variable</b>	<b>2 Pooled</b>	<b>3 FEM</b>	<b>4 REM</b>	<b>5 FEM</b>	<b>6 REM</b>
Constant	-50.26*** (-12.36)	2.20 (0.06)	-32.67*** (-3.63)	-80.64 (-0.58)	-18.12*** (-4.07)
LOG(GDPI)	1.32*** (10.16)	-2.72*** (-3.03)	0.94*** (4.29)	-2.65** (-2.94)	0.09* (1.76)
LOG(POPI)	0.36***			3.96	0.08***

<sup>6</sup> The pooled model is the ( $\alpha_{ij} = \alpha$ ) and same parameters over time and across trading partners, while the unrestricted model allows an intercept and other parameters to vary across trading partners



	(3.34)			(0.75)	(2.88)
LOG(GDPJ)	1.49*** (11.76)	3.40*** (3.88)	1.46*** (6.77)	3.42*** (3.87)	0.17*** (5.73)
LOG(POPJ)	0.14 (1.32)			0.86 (0.16)	0.03 (0.48)
LOG(DIS)	-1.29*** (-3.92)		-1.12 (-1.19)		-1.41 (-1.47)
CL	-0.21 (-0.42)		-0.23 (-0.16)		-0.38 (-0.27)
CB	2.51** (5.36)		2.12 (1.61)		2.59* (1.93)
R2	0.64	0.78	0.58	0.78	0.61
F	94.14	34.74		33.70	
Hausman Test		31.95 (0.0000)		25.42 (0.0000)	
No of Observation	728	728	728	728	728
No of Groups	56	56	56	56	56
Obs per group	7	7	7	7	7

Note: \*, \*\*, \*\*\* indicate significance at 10, 5 and 1 per cent respectively

-t-statistics in parentheses

The Table shows that all the estimated coefficients of the preferred model in column 6 carry their expected signs, and in line with the theory, except the dummy variable of common language and ex-colony links. The coefficient of GDP of the exporter country is positive and significant as expected, implying that an increase in national income of the exporting country encourages trade flows to the trading partner. The impact of the exporter's population is also positive and significant, confirming most of the previous empirical studies (e.g. Simwaka (2011) and Pastore et al., (2009)).



The GDP and population size of the trading partner have positive impact on trade flow from the source countries. This finding indicates that a trading partner with a large economy and market size measured by its GDP and population size encourage the volume of trade with the exporter country. In addition, the coefficient of geographical distance is negative as expected, implying that high transportation costs between member countries negatively affect trade flows.

Unexpected, the coefficient of the dummy variable of common language or common border is negative, but it is not statistically different from zero. This result suggests that members speak same language or have ex-colony links tend to reduce the size of trade between them. This finding could be explained by the fact that there is few countries of ASEAN speak the same language and most of them are occupied by different colonizers. Finally, the impact of common border is found to be positive, suggesting that members sharing a common land or sea borders enjoy more trade activities between them.

Second, the results of gravity model of selected MERCOSUR members are presented in Table 6 below. We estimated the model using pooled, fixed and random effects methods. Here, also we applied the same criterion that used in the model of ASEAN to select the best model. The Hausman test rejects the hypothesis that the coefficients of the FE models and the RE models are equal, suggesting that FE estimates are more consistent. However, to consider the time varying and time invariant effects we select the random effect as suggested by (Pastore et al., 2009). Therefore, the preferred model is that of RE presented in column 6 which takes into account all variables specified in our gravity model.

The results of the random effects in column 6 have high explanatory power as indicated by R squared. All variables also bear the expected signs and fit well with theory, except dummy variable of common borders. The results show that the coefficients of exporter' income, importer' income, home population and trade partners' size of population are positive and statistically significant. This implies that GDP and population size of trade partners exert positive impact on trade follows between members of MERC integration.

**Table 6: Results of Gravity model estimation for intra-MERCOSUR trade (1995-2010)**

The dependent Variable is the total trade (exports +imports, in US\$)					
Variable	2 Pooled	3 FEM	4 REM	5 FEM	6 REM
Constant	-4.017	-1.607	-3.667	-58.40***	-4.977



	(0.008)	(-0.72)	(-1.51)	(-5.77)	(-1.40)
LOG(GDPI)	0.461*** (7.57)	0.785*** (5.13)	0.510*** (9.73)	0.511*** (3.30)	0.397*** (3.43)
LOG(POPI)	0.151 (1.42)			3.86*** (5.94)	0.595** (2.40)
LOG(GDPJ)	0.386*** (7.88)	0.087 (0.57)	0.367*** (7.01)	0.027 (0.18)	0.367*** (3.54)
LOG(POPJ)	0.004** (2.10)			0.007 (1.08)	0.001*** (3.17)
LOG(DIS)	-0.068 (0.39)		0.284 (0.95)		-0.600 (-1.26)
CL	-0.476*** (-3.09)		-0.712*** (-3.10)		0.246 (0.59)
CB	0.200 (1.20)		0.361 (1.17)		-0.292 (-0.64)
R2	0.87	0.58	0.56	0.50	0.93
F	202.62 (0.000)	50 (0.000)		47 (0.000)	
Hausman Test		3.82 (0.1484)		39.54(0.000)	
No of Observation	204	204	204	204	204
No of Groups	12	12	12	12	12
Obs per group	17	17	17	17	17

Note: \*, \*\*, \*\*\* indicate significance at 10, 5 and 1 per cent respectively

-t-statistics in parentheses





Expectedly, the effect of geographical distance is found to be negative as expected, but it is not statistically significant. In addition, the results revealed that the coefficient of the dummy variable of common language is positive, indicating that MERCOSUR members that speak same language or have ex-colony links tend to trade more. Finally, the impact of common border is found to be negative, but it is not statistically different from zero.

## **5.2. Estimating Potential Trade of COMESA and SADC Integration**

Having estimated the gravity models of ASEAN and MERCOSUR trade blocs, the next step is to project the potential trade by applying the coefficients of the estimated gravity models to COMESA and SADC members. Due to availability of data we measured the potential trade for eight COMESA countries and nine SADC members over the period 2004-2011. The potential trade is compared with actual trade in order to assess the success of intra trade of COMESA and MERCOSUR. The average of potential to actual trade ratios between each member of COMESA and SADC during the period 2004-2011 are presented in Annex II through V.

Annex II presents the ratios of potential to actual trade of intra-COMESA compared to intra-ASEAN trade performance. The results show that for all selected countries the average ratio of potential to actual trade is greater than one, implying that potential trade among these eight COMESA members is higher than actual trade level over the period 2004-2011. Although, there is a big difference between observed and predicted level of trade for all trading members, there is a variation across countries. For example, the actual trade of Egypt with Malawi, Zambia and Zimbabwe is far from its potential, over the period 2004-2011. This could be attributed to the far distance between Egypt and these countries. On the other hand, Egypt has a low potential trade gap with Ethiopia, Kenya and Mauritius. In addition, the potential to actual trade ratios are also high for Ethiopia with the far distance countries like Zambia, Zimbabwe and Mauritius. Notably, Kenya is the most successful country among the selected COMESA members. Expectedly, the performance of Kenya-Uganda trade relation is the most successful, as the ratio of potential to actual trade is very low; this situation can be attributed to the common border, language and ex-colony links between the two countries. Overall, the results indicate that the intra-COMESA trade is far from its potential compared to intra-ASEAN trade integration. These, results confirm the findings provided by Ebaidalla and Yahia (2013).

Annex III presents the performance of intra-COMESA relative to the intra-MERCOSUR trade integration. Similar to the results of COMESA relative to ASEAN model, the ratios of potential to actual trade are very high, implying unfavorable performance of intra-COMESA compared to MERCOSUR trade integration. For some country pairs like Egypt-Zimbabwe, Ethiopia-Mauritius, Ethiopia-Malawi and Ethiopia-Zambia the average ratios of potential to actual trade are high, confirming the results of COMESA-ASEAN model. The results indicate that Kenya is the most successful country among the selected COMESA members,



confirming the results of COMESA-ASEAN model. As shown in Annex III the actual trade of Kenya is less distant from its potential with all countries, especially Uganda.

For the performance of SADC relative to the ASEAN integration, Annex IV presents the average ratios of potential intra-trade to actual trade for nine SADC members. The results pointed out that for all selected SADC countries the potential trade is far distance from the actual trade. Despite the huge gap between potential and actual trade, the differences vary from country pair to another. For county pairs like Congo-Madagascar, Congo-Mauritius, Malawi-Madagascar and Zambia-Madagascar, the ratios of potential to actual trade are high; this may be due to far distance between these countries and the absence of cultural linkages like language and history. The results show that South Africa is the most successful country among the selected SADC members, as the ratio of potential to actual trade is less than 1 with all trading partners of SADC. This implies that the actual trade of South Africa with other SADC member is greater than its potential trade. The success of South Africa can be explained by its location in SADC region as well as its comparative advantages in the high value added commodities. This finding confirm the trade statistics presented in Table 2 which show that the contribution of South African trade to intra-exports and imports is the largest one among other SADC members. Finally, the performance of SADC relative to success of ASEAN integration is far better than the performance of COMESA relative to intra-ASEAN trade integration.

Regarding the performance of SADC compared to intra-MERCOSUR performance, the results of average ratios of potential to actual trade are presented in Annex V. Like the results of SADC-ASEAN model, the analysis reveals that most of selected SADC members exhibit high ratios of potential to actual trade. Countries like Congo, Madagascar and Mauritius reported far distance between actual and potential trade with other SADC members. In the model of SADC-MERCOSUR, South Africa also is only the most successful SADC member, confirming the results of SADC-ASEAN model.

Overall, the ratios of potential to actual trade indicate that both COMESA and SADC are exhibit unfavorable intra-trade performance compared to the ASEAN and MERCOSUR trade arrangements. However, based on the success of intra-ASEAN and MERCOSUR, the findings revealed that the performance of intra-SADC trade is better than the performance of intra-COMESA, implying that COMESA members should exert more efforts to improve their intra trade integration.

## **6. Conclusion and Policy Implications**

This paper assessed the performance of intra-COMESA and SADC trade integration on the basis of success of two non-Africa trade arrangements namely, ASEAN and MERCOSUR. The study used an out-of-sample approach and employed a gravity model for country samples selected from ASEAN and SADC trade blocs. The estimated coefficients of the gravity equations have been applied to intra-COMESA and intra-SADC trade model to calculate the



potential trade. Then, the intra-trade performance of the two trade blocs is measured by the ratio of potential to actual trade.

The empirical analysis shows that the actual intra-trade of COMESA and SADC is far from the estimated potential trade level, implying unfavorable performance of the African trade integration compared to ASEAN and MERCOSUR trade arrangements. The results also indicate that for all COMESA members, except Kenya the ratio of potential to actual trade is very high. In addition, the results revealed that actual trade between Kenya and Uganda is the most successful bilateral trade among COMESA members, relative to success of both intra-ASEAN and SADC.

Regarding the performance of SADC, the result pointed out that the actual intra-trade for most of SADC members is less than the estimated potential trade. Some SADC members like Congo, Madagascar and Mauritius exhibit low intra-SADC performance compared to ASEAN and ASDC. The results also indicated that among SADC members, South Africa is the most successful country with potential to actual trade ratios less than unity. Moreover, the performance of bilateral trade between Zambia and Zimbabwe is successful; this due to the common border and less geographical distance. This result implying that the actual bilateral trade between countries with common language, border or ex-colony links is close to its potential level. This finding also confirms the significant impact of distance and cultural aspects on intra-trade of African trade blocs.

Based on the above results many policy implications can be drawn to improve the intra-African trade. Since African regional integration blocs (COMESA and SADC) are far from their potential integration level, policy makers in the members of these blocs need to adopt effective trade promotion measures to achieve trade potential level. Precisely, exports diversification should be at the top of policy agenda for African countries. Therefore, member countries need to give a special attention to industrialization so as to enhance trade integration, since industrialization is the major reason behind the success of ASEAN and MERCOSUR integration. In addition, increasing regional trade needs promoting of transport and communication infrastructure networks between the members. Further efforts should be exerted to attract foreign direct investment and private capital so as to promote the trade sectors. Finally, policy makers in the continent should adopt various policies to facilitate the flow of trade between members of trade blocs. These policies include for example, flexible tax regimes, reducing transactions costs, building social peace and developing the human capital.



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## Annexes





### **Annex I: List of Countries used in the Analysis**

<b>COMESA Members</b>	<b>SADC Members</b>	<b>ASEAN Members</b>	<b>MERCOSUR</b>
Egypt	Congo	Brunei Darussalam	Brazil
Ethiopia	Madagascar	Indonesia	Argentina
Kenya	Malawi	Laos	Paraguay
Malawi	Mauritius	Malaysia	Uruguay
Mauritius	Mozambique	Philippines	
Uganda	South Africa	Singapore	
Zambia	Tanzania	Thailand	
Zimbabwe	Zambia	Vietnam	
	Zimbabwe		

### **Annexes II-V: The Average Ratio of Potential to Actual trade**

#### **Annex II: Intra-COMESA Relative to ASEAN Integration: Average of Potential to Actual Ratio of Bilateral Trade (2004-2011)**

	Egypt	Ethiopia	Kenya	Malawi	Mauritius	Uganda	Zambia	Zimbabwe
Egypt	0.00	112.7995	29.10	2026.49	193.15	356.42	810.14	2235.22
Ethiopia	175.47	0	185.05	408.90	2910.37	1642.05	3242.78	2498.20
Kenya	4.49	14.51319	0.00	14.22	49.74	1.02	9.81	140.86
Malawi	10.38	528.508	36.47	0.00	381.96	372.20	11.96	4.74
Mauritius	368.71	1668.076	58.90	1321.40	0.00	457.83	299.24	127.54
Uganda	245.37	1068.232	4.62	647.19	468.19	0.00	2192.34	1642.75
Zambia	49.54	1055.433	20.72	3.77	128.24	356.41	0.00	3.02
Zimbabwe	422.20	1486.544	119.27	4.66	86.11	1173.01	2.91	0.00

#### **Annex III: Intra-COMESA Relative to MERCOSUR: Average Rate of Potential to Actual Trade (2004-2011)**



Egypt      Ethiopia      Kenya      Malawi      Mauritius      Uganda      Zambia      Zimbabwe

Egypt	0.00	165.1799	170.52	413.66	488.15	562.88	57.85	1860.13
Ethiopia	77.67	0	62.28	6748.23	3851.92	1311.55	4647.61	2016.92
Kenya	6.19	35.76425	0.00	28.66	49.48	2.39	18.40	145.23
Malawi	22.16	6009.552	22.90	0.00	262.47	541.75	7.58	4.65
Mauritius	41.77	3588.544	47.85	1050.77	0.00	759.64	74.62	90.53
Uganda	45.48	1190.887	2.42	615.32	178.06	0.00	834.29	625.02
Zambia	46.43	3546.528	15.77	7.85	73.71	661.30	0.00	3.51
Zimbabwe	350.83	4686.028	111.06	6.68	49.62	1324.69	4.18	0.00



**Annex IV: Intra-SADC Relative to ASEAN: Average Rate of Potential to Actual Trade (2004-2011)**

	Congo	Madagas- car	Mali	Mauritius	Mozam- bique	South Africa	Tanzania	Zambia	Zim- babwe
Congo	0.00	318.10	287.07	316.40	156.00	75.60	49.11	0.53	0.96
Madagascar	830.47	0.00	683.68	1.25	116.22	47.41	394.82	728.48	173.84
Mali	10.83	335.99	0.00	75.78	2.00	6.62	9.47	1.97	0.95
Mauritius	402.38	0.17	134.91	0.00	17.20	8.54	23.94	29.98	11.59
Mozambique	58.10	52.41	0.48	43.23	0.00	1.36	43.25	11.28	0.31
South Africa	0.59	2.24	0.78	0.89	0.22	0.00	0.65	0.21	0.19
Tanzania	1.01	12.90	0.47	17.26	3.51	12.04	0.00	1.02	10.75
Zambia	0.18	705.52	0.28	90.88	17.08	0.96	0.88		0.25
Zimbabwe	0.81	421.59	0.65	8.19	3.26	1.43	18.24	0.40	0.00

**Annex V: Intra-SADC Relative to MERCOSUR: Average Rate of Potential to Actual Trade (2004-2011)**

	Congo	Mada- gascar	Mali	Mauritius	Mozam- bique	South Africa	Tan- zania	Zambia	Zim- babwe
Congo	0.00	1086.50	66.47	1398.10	515.84	168.26	142.07	1.68	3.25
Madagascar	492.42	0.00	403.30	3.59	331.83	103.64	1007.14	671.77	519.53
Mali	26.14	96.11	0.00	197.49	5.24	14.39	22.67	4.93	2.49
Mauritius	1544.75	0.51	449.82	0.00	50.21	18.72	62.06	82.85	35.85
Mozambique	152.93	158.35	1.62	127.47	0.00	2.99	112.59	31.55	0.94
South Africa	2.49	9.68	3.41	3.82	0.96	0.00	2.70	0.90	0.81





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Tanzania	3.03	44.31	1.77	58.39	11.79	26.87	0.00	3.22	37.18
Zambia	0.51	294.49	0.99	22.85	53.04	2.12	2.43	0.00	0.82
Zimbabwe	2.11	1246.04	2.09	23.32	9.36	3.13	46.07	1.07	0.00

