Intra-African Trade and Competitiveness in Africa

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Abstract
This paper investigates the competitiveness of the African continent by studying the impact of relevant intra-African trade indices on the competitiveness of the continent, based on a panel dataset spanning 2000 to 2016. The results show considerable variations in trade performance and competitiveness. Intra-African trade, especially in exports, over the study period, was consistently low. While the South Africa region had the highest intra-regional trade in imports, East Africa region had the highest level of inter-regional imports. West Africa, with Nigeria's dominance, had the highest level of intra-regional exports, while South Africa had the highest inter-regional exports at country level. For the Regional Economic Communities (RECs), SADC reported the highest intra-African import trades, while SACU reported the highest inter-regional imports. SADC has the highest intra-African exports, while COMESA has the highest inter-regional exports. African Competitiveness Index (ACI) ranking puts the East Africa region on top, and South Africa as the most competitive African economy. The results were mixed but plausible. All the variables were correctly signed and significant in different regions, reflecting the huge structural and policy disparities among the regions. Continued transformation of African economies with emphasis on both physical and financial infrastructure, and human capital development is advised, as it will enhance intra-African trade and regional competitiveness.

Keywords*: Trade, Economic integration, Intra-regional trade, Competitiveness*

JEL Classification: F13, F15, F42, R11

Introduction

In March 2018, about 44 African countries signed the African Continental Free Trade Area (AfCFTA) (Moehr, Coles, & Tsiknia, 2018), with the hope of using

it to drive greater competitiveness in the continent. Trade has been identified as a possible route by which Africa could innovate its way out of its various predicaments. Promoting intra-African trade through the instrumentality of regional integration is therefore considered essential (African Development Bank [AfDB], Organisation for Economic Cooperation and Development, [OECD], & United Nations Development Programme [UNDP], 2017; Akorede, 2018).

One very significant challenge at the time was the fact that the largest economy in Africa, Nigeria, alongside about 9 other countries did not signed the agreement, due to concerns over domestic industry protection, labour force considerations, as well as the distribution of the prospective gains (Bello & Gass, 2018; Moehr *et al.*, 2018; Witschge, 2018). Besides, Africa stands as the continent with the highest number of RECs, but this is not accompanied by substantial trade among members, due to their low levels of competitiveness (Jordaan, 2014). The current underperformance of intra-African trade is ironical, given that, on the average, an African country belongs to at least 1 REC, while 31 African nations belong to at least 2 RECs (Jordaan, 2014; Geda & Seid, 2015). Africa features the lowest intra-continental trade as a percentage of total trade standing at 18%, compared to 35% for Latin America, 45% for Asia, and 60% for Europe (Bello & Gass, 2018). Joordan (2014) reports that Africa exports over 80% of its output to non-African countries, while importing as much as 90% of requited items from non-African countries

Africa needs to enhance its competitiveness in order to sustain its limited development gains. Kimenyi, Lewis and Routman (2012) emphasise that intra-African trade can boost the competitiveness of African economies via economies of scale and improving the efficiency of firms. However, empirical evidence on Africa's competitiveness is very scanty. Moreover, the measurement of competitiveness in the few studies that exist for Africa did not use global measures or indicators of competitiveness. Yet, econometric evidence on Africa's competitiveness and its drivers remains a critical piece of information. This study meets these gaps, by adopting the global competitiveness index (GCI) of the sampled African countries as a composite measure of competitiveness capturing several dimensions of national economic well-being. This study therefore focuses on the important role, which increased

intra- and inter-regional trade, and stable macroeconomic conditions could play to enhance the competitiveness of African states.

Intra-African Trade: Stylized Facts

Macroeconomic Conditions

The Afreximbank (2017) in its report indicated that intra-African exports and imports performed better in 2016 than it did in 2015. Three main drivers were identified as responsible for the gain in momentum in intra-African trade in 2016 namely. They are Commodity prices; massive trading by some top intra-African traders and enhanced trading within regional economic blocs, and Currency shifts.

While the above gain in momentum in 2016 is desirable, the entire picture in terms of comparing intra-African trade to other intercontinental trade as well as the growth performance of the intra-African trade shows a bleak picture. In figure 1 below, it can be seen that intra-African trade is dwarfed by volume of intercontinental trade from other regions of the world, especially in Asia, Europe, and North America.

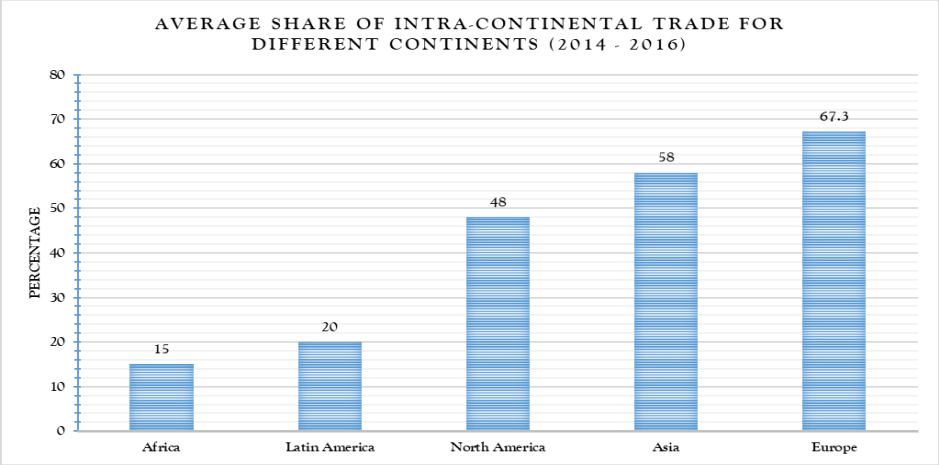
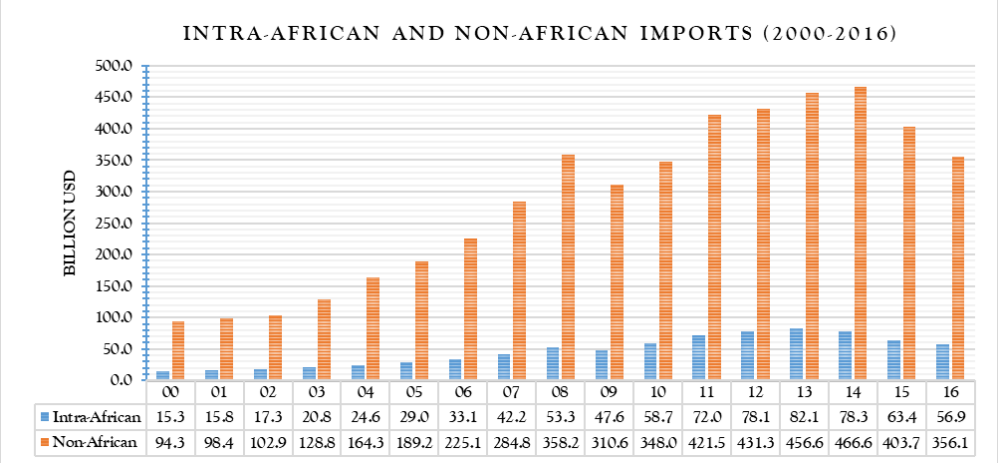


Figure 1: Intra-African Trade Vis-à-vis Other Intracontinental Trade
Source: *Afreximbank (2017)*

The performance trend of infra-African trade is examined here. Comparison between intra-African trade and non-African trade is also presented here, as

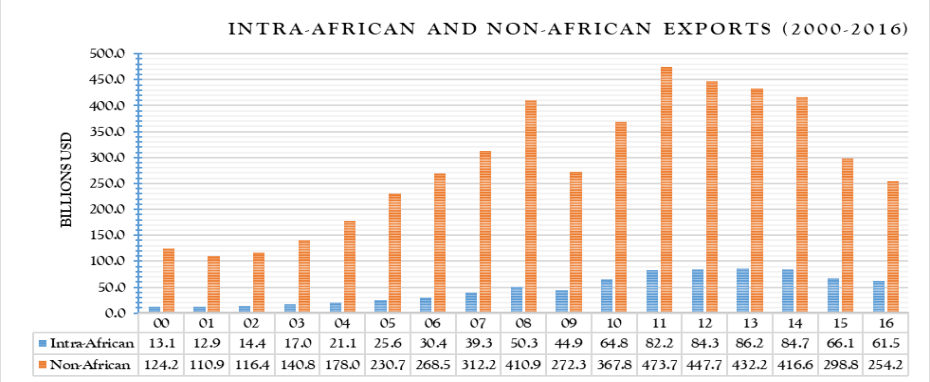
well as trade between Africa and emerging and developing economies. Top intra-African traders are also identified. The review period is 2001 – 2016 coinciding with the formation of the AU and recent times.

Figures 2 and 3 show the level of intra-African imports and exports compared to the non-African component. As can be seen for the entire period, both exports and imports within the African countries consistently falls below imports and exports to non-African countries.



	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Intra-African	15.3	15.8	17.3	20.8	24.6	29.0	33.1	42.2	53.3	47.6	58.7	72.0	78.1	82.1	78.3	63.4	56.9
Non-African	94.3	98.4	102.9	128.8	164.3	189.2	225.1	284.8	358.2	310.6	348.0	421.5	431.3	456.6	466.6	403.7	356.1

Figure 2: Intra-African Imports Vis-a-vis Non-African Imports
Source: *IMF Direction of Trade Statistics (2017)*



	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Intra-African	13.1	12.9	14.4	17.0	21.1	25.6	30.4	39.3	50.3	44.9	64.8	82.2	84.3	86.2	84.7	66.1	61.5
Non-African	124.2	110.9	116.4	140.8	178.0	230.7	268.5	312.2	410.9	272.3	367.8	473.7	447.7	432.2	416.6	298.8	254.2

Figure 3: Intra-African Imports Vis-a-vis Non-African Exports
Source*: IMF Direction of Trade Statistics (2017).*

The absolute figures reported in figures 2 and 3 shows dominance of non-African trade. For exports, the higher exports to non-African countries stems for higher prices that the non-African countries have to offer, as well as better industrial base with huge demand for raw materials that Africa can offer. For the imports, higher imports from non-African countries stems from their weak manufacturing base of most African economies and their high import dependence. Within Africa however, the exports exceed the imports, which is largely as a result of the higher non-African imports explained above. This is shown in figure 4.

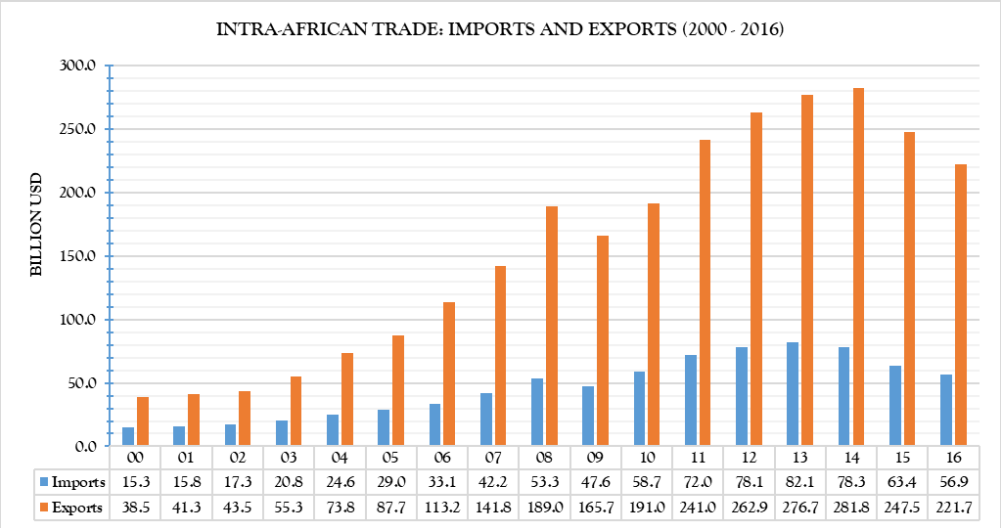


Figure 4: Comparing Intra-African Imports and Exports
***Source**: IMF Direction of Trade Statistics (2017).*

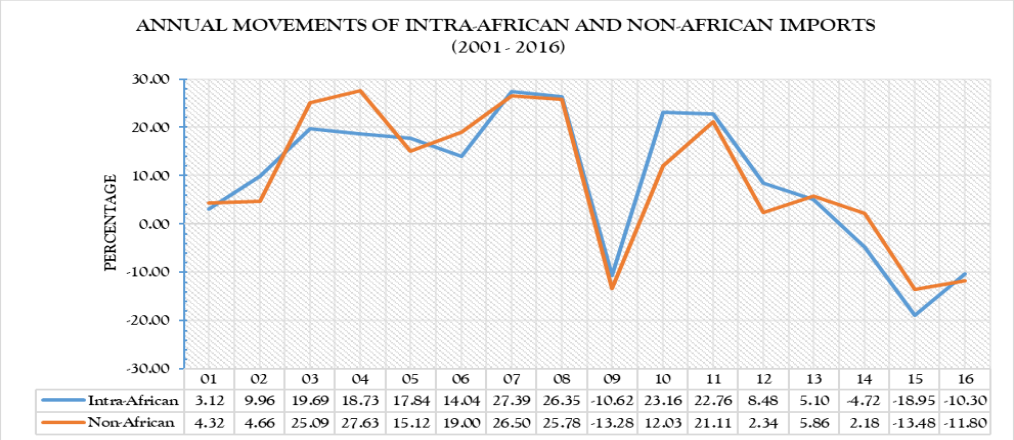
Table 1: Growth Rates of Intra-African and Non-African Trade (2001 – 2016)

	AVERAGE IMPORTS		AVERAGE EXPORTS	
Year	Intra-African	Non-African	Intra-African	Non-African
2001-2016	9.50%	9.57%	11.50%	6.87%

***Source**: Author's Computation from IMF Direction of Trade Statistics (2017).*

The growth rates of intra-African and non-African trade shows a quite different picture from the absolute figures reported in figures 2 and 3. As shown in table 1, the average growth rate of intra-African and non-African imports for the review period averaged 9.50% and 9.57% respectively, while growth rate of

intra-African and non-African exports averaged 11.50% and 6.87% respectively. As seen, the growth rate of the non-African imports slightly exceeds that of the intra-African imports. In contrast, the growth rate of intra-African exports far exceeds that of non-African exports. This stems from the growing volume of trade between regional economic blocs in Africa, as Africa is increasingly recognising the imperatives of trading within itself.



	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Intra-African	3.12	9.96	19.69	18.73	17.84	14.04	27.39	26.35	-10.62	23.16	22.76	8.48	5.10	-4.72	-18.95	-10.30
Non-African	4.32	4.66	25.09	27.63	15.12	19.00	26.50	25.78	-13.28	12.03	21.11	2.34	5.86	2.18	-13.48	-11.80

Figure 5: Growth Rates of Intra-African and Non-African Imports
***Source**: Author's Computation from IMF Direction of Trade Statistics (2017).*

Figure 5 shows both intra-Africa and non-African imports declining in 2009, and 2014 – 2016. However, non-African imports had the biggest growth in a single period, growing by 27.68% in 2004, compared to the highest growth of intra-African imports of 27.39% in 2007. Intra-African imports recoded the most decline of 18.95% in 2015, compared to 13.48% decline in non-African trade in 2015.

Figure 6 replicates same decline patterns for both intra-Africa and non-African exports, declining in 2009, and 2014 – 2016. However, non-African exports recorded the most decline of 33.72% in 2009, compared to the highest decline of intra-African trade of21.94% in 2015. Also, intra-African trade recorded the most growth of 44.29% in 2010, compared to the highest growth of 35.08% recorded by non-African exports in 2010.

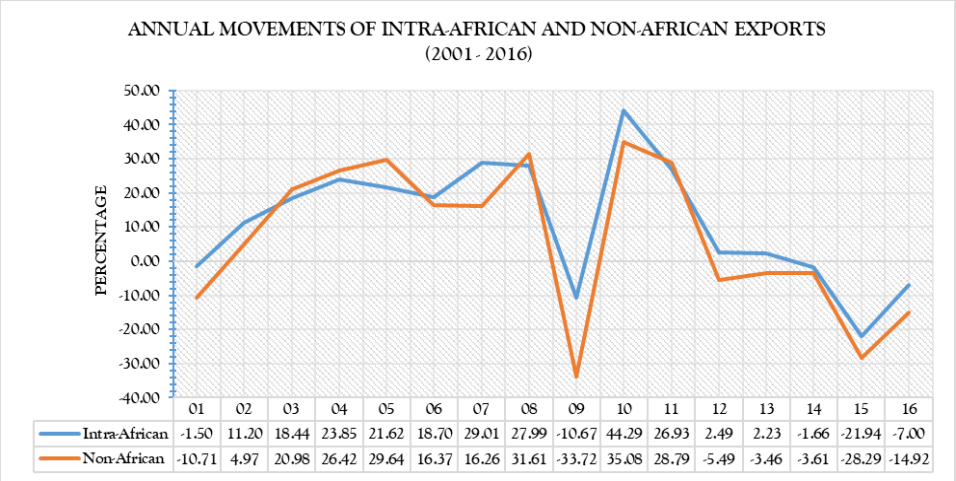


Figure 6: Growth Rates of Intra-African and Non-African Exports
Source: *Author's Computation from IMF Direction of Trade Statistics (2017).*

The pattern of non-Africa trade delineated between emerging and advanced economies is presented in figure 7 below. The results show two divergent patterns, wherein African trade to emerging economies fell below trade with advanced economies between 2000 and 2011. However, African trade to emerging economies exceeded trade to advanced economies from 2011 – 2016. The rapid industrialisation of emerging markets very well explains the change from 2011 – 2016.

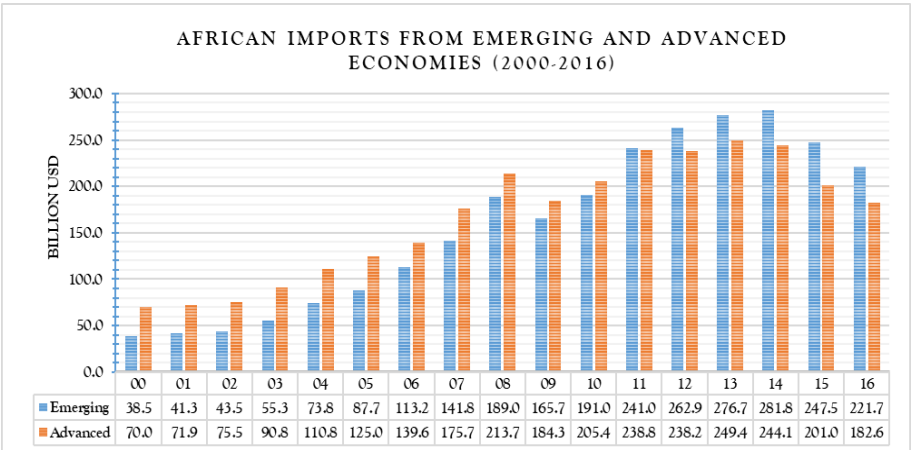


Figure 7: African Trade with Emerging and Advanced Economies
Source: *Author's Computation from IMF Direction of Trade Statistics (2017).*

Afreximbank (2017) identified the biggest intra-African traders, on the basis of volume of trade between 2014 - 2016, which placed South Africa as the biggest intra-African trader, followed by Nigeria and Namibia in 2nd and 3rd places respectively. Presented below is the average of the share of these countries' trade in intra-African imports and exports for the period 2000 – 2016.

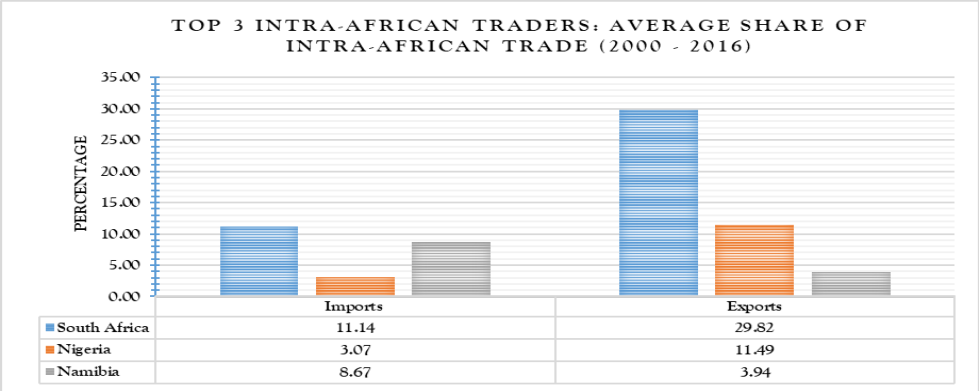


Figure 8: Top Three Intra-African Traders
Source: *Author's Computation from IMF Direction of Trade Statistics (2017).*

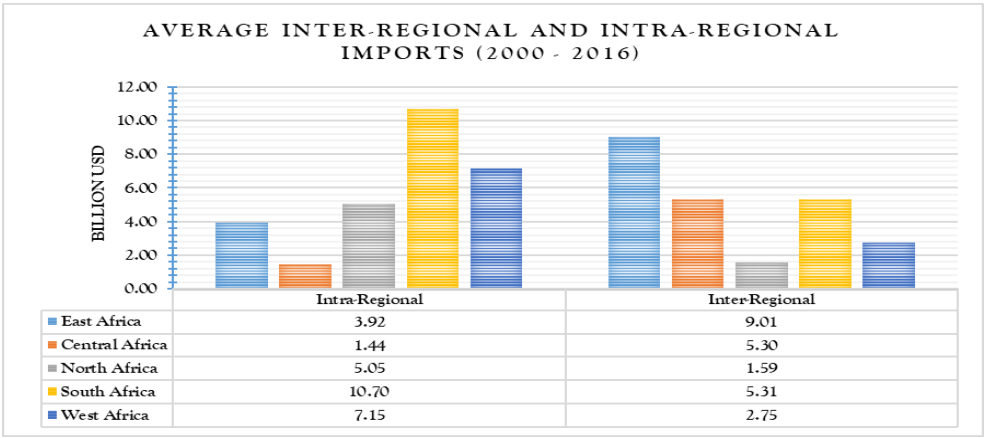


Figure 9: Intra-Regional and Inter-Regional Imports between Regions of Africa
Source: *Author's Computation from UNCTAD Stat.*

The direction of import trade between the regions of Africa is captured in figure 9 above, which shows that the South Africa region have the highest intra-regional imports, while East Africa has the highest level of inter-regional

imports. In figure 10 below, West Africa had the highest levels of intra-regional exports, while South Africa had the highest level of inter-regional trade.

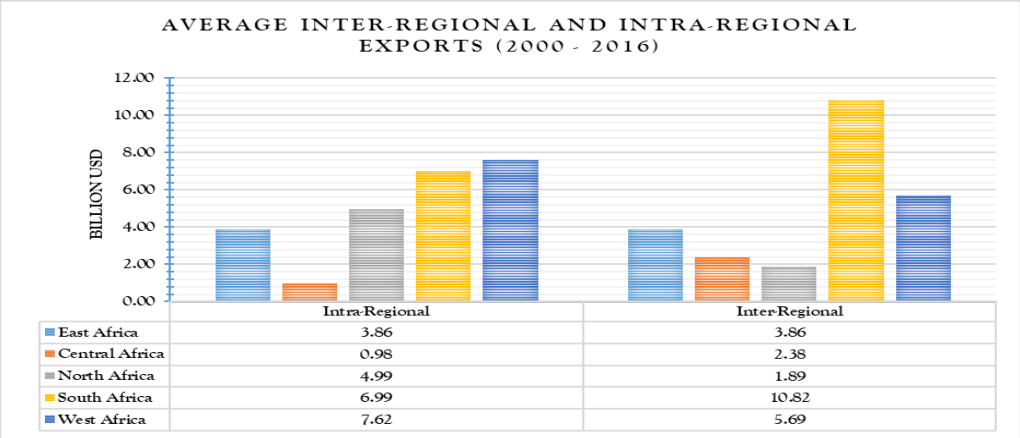


Figure 10: Intra-Regional and Inter-Regional Exports between Regions of Africa
***Source**: Author's Computation from UNCTAD Stat.*

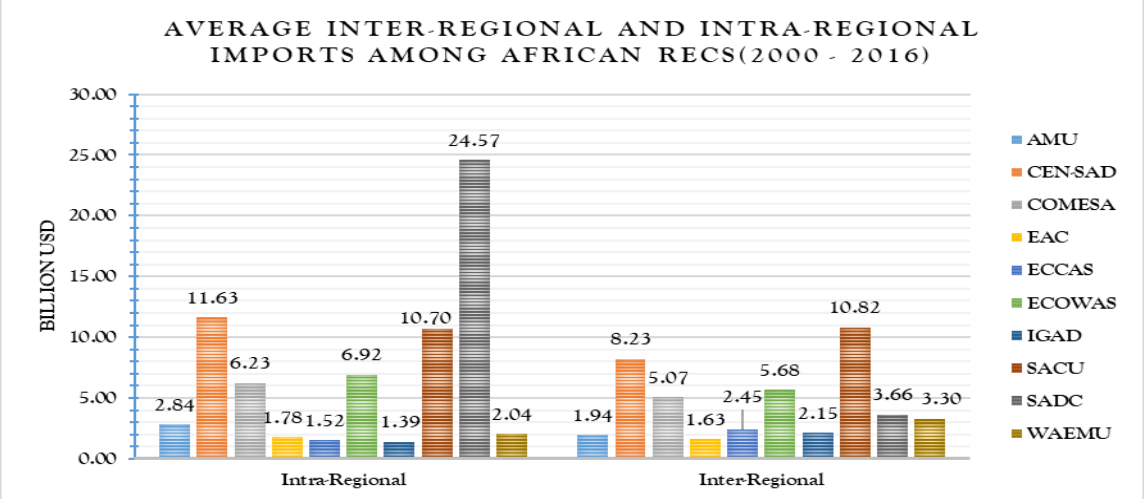


Figure 11: Intra-Regional and Inter-Regional Imports between Resin Africa
***Source:** Author's Computation from UNCTAD Stat.*

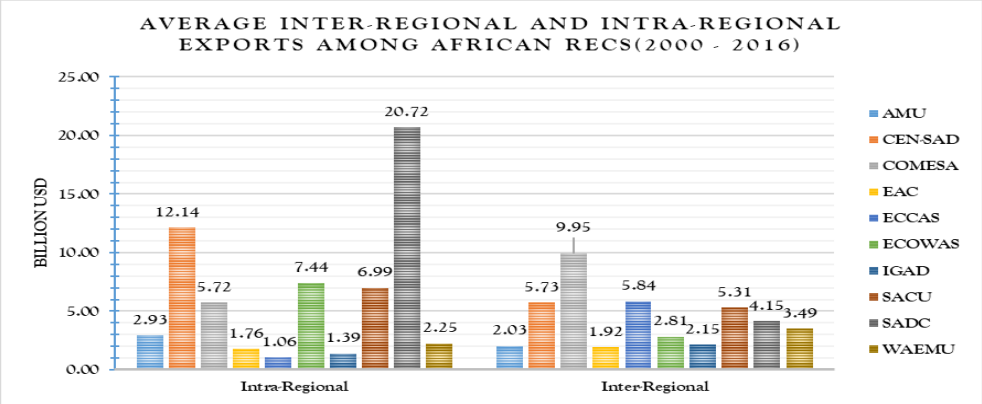


Figure 12: Intra-Regional and Inter-Regional Exports between RECs in Africa
Source: *Author's Computation from UNCTAD Stat.*

Figures 11 and 12 capture intra-African and inter-African trade among the major regional economic groupings in Africa. The Southern African Development Community (SADC) reported the highest intra-African imports, while the Southern African Customs Union (SACU) reported the highest inter-regional imports. SADC is shown to have the highest intra-African exports, while the COMESA is shown to have the highest inter-regional exports.

Overview of the Competitiveness Performance of AU Member Countries
The competitiveness of 20AU member countries broadly categorised into the regions is captured in figure 13, wherein the average competitiveness index of all the 4 countries for each region between 2012 and 2016 is obtained and charted below. In figure 13, it can be seen that East Africa stand as the most competitive region with an average index of 3.835. This is followed by South Africa with an average index of 3.725. The least competitive region is Central Africa, with the lowest average index of 3.345.

Figures 14 through 18 captures the region specific competitiveness rankings for the 4 economies selected in each region. In North Africa, figure 14 captures Morocco as the most competitive economy, and moving up the ranking from 77thposition in 2013 to 70th position in 2016. Both Mauritania and Egypt made steady declines in the global competitiveness index (GCI) rankings. Algeria rose phenomenally in the rankings from 110th in 2012 to 79th in 2014, but dropped to 89th by 2016.

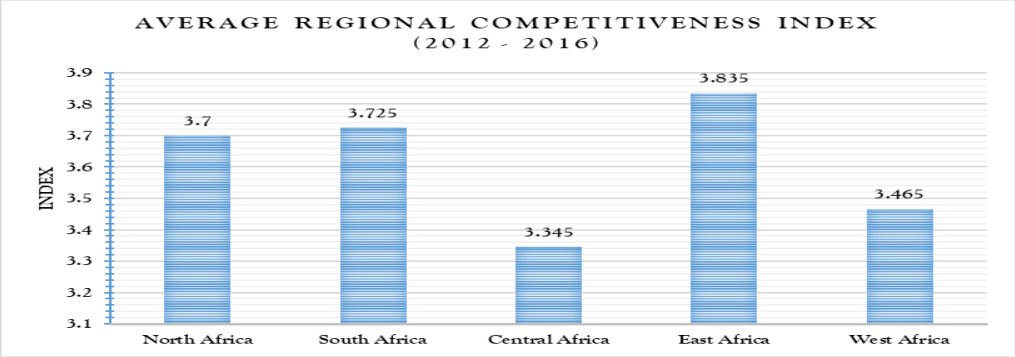
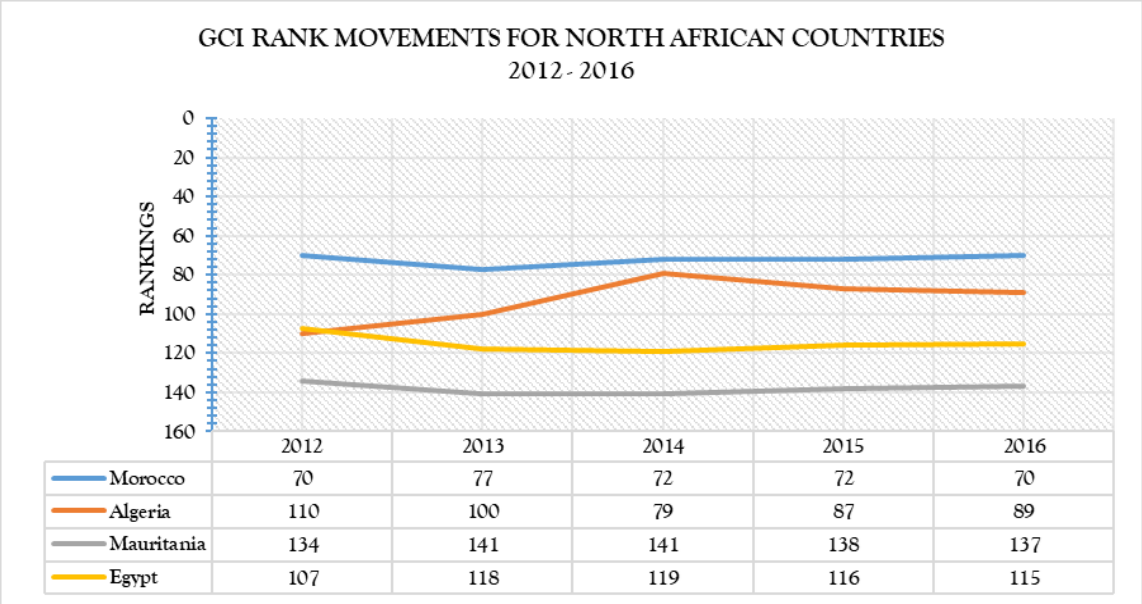


Figure 13: Regional Competitiveness in Africa
***Source**: Author's Compilation from Global Competitiveness Report (2018).*

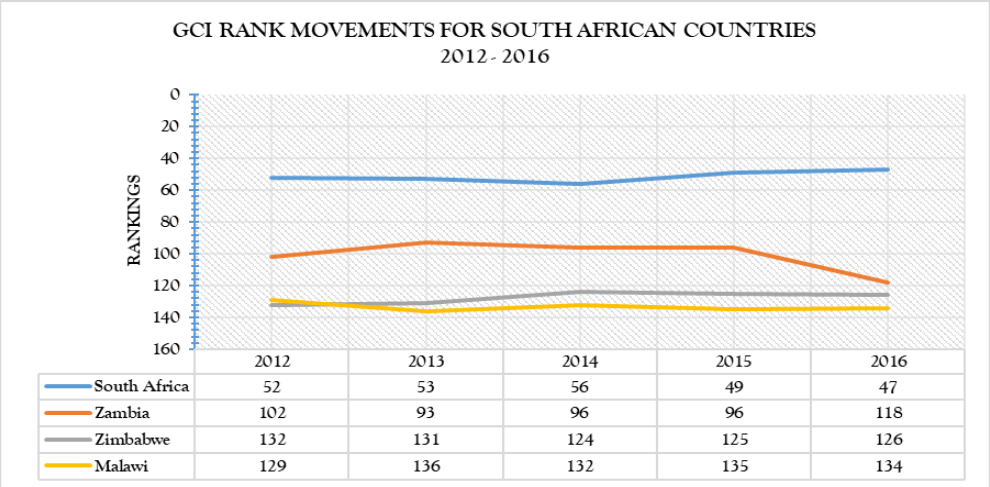


	2012	2013	2014	2015	2016
Morocco	70	77	72	72	70
Algeria	110	100	79	87	89
Mauritania	134	141	141	138	137
Egypt	107	118	119	116	115

Figure 14: Competitiveness Rankings in North Africa
***Source**: Author's Compilation from Global Competitiveness Report (2018).*

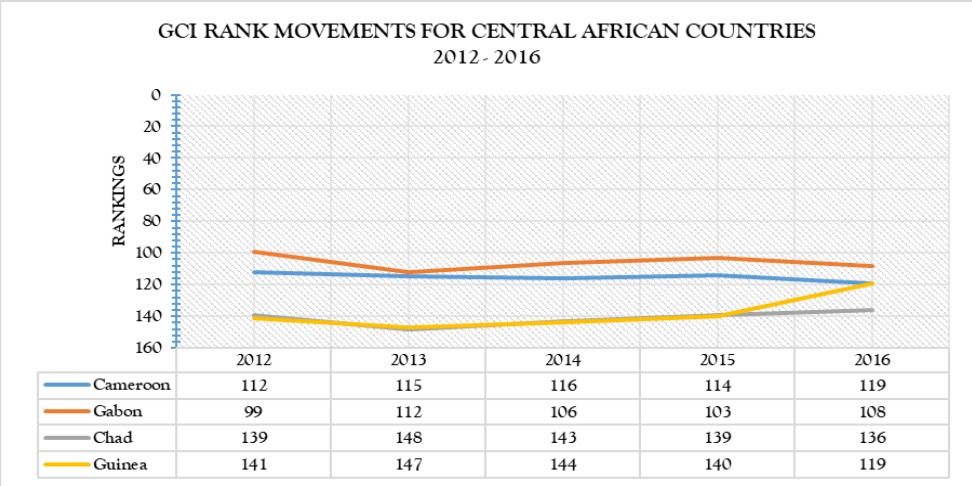
Figure 15 captures the competitiveness performance of 4 economies from South Africa region. South Africa stands as the most competitive economy in this region, though it dropped slightly from 52nd on the 2012 rankings to 56th in the 2014 rankings, but made gains on the rankings by moving to 47th on the 2016 rankings. Zimbabwe made some upward movements on the GCI rankings,

from 132nd in 2012 to 126th in 2016. Zambia and Malawi fell down the rankings for the review period.



	2012	2013	2014	2015	2016
South Africa	52	53	56	49	47
Zambia	102	93	96	96	118
Zimbabwe	132	131	124	125	126
Malawi	129	136	132	135	134

Figure 15: Competitiveness Rankings in North Africa
Source: *Author's Compilation from Global Competitiveness Report (2018)*

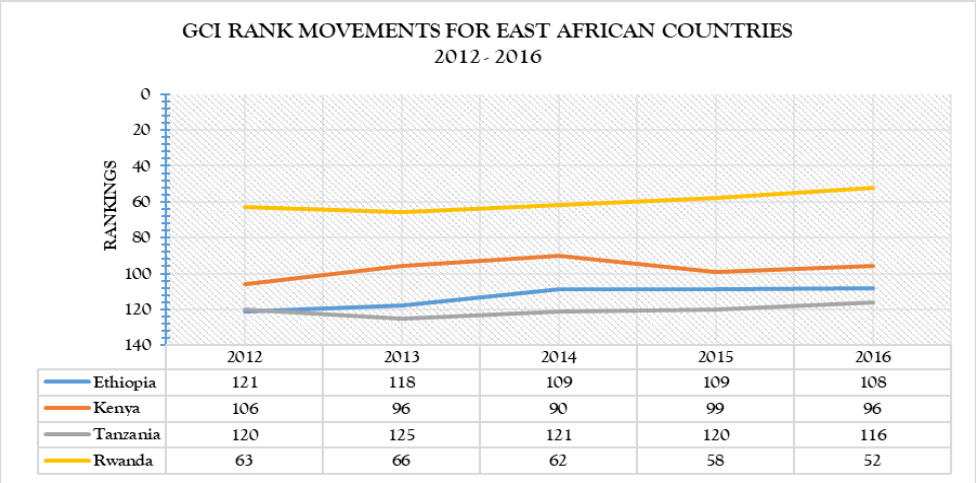


	2012	2013	2014	2015	2016
Cameroon	112	115	116	114	119
Gabon	99	112	106	103	108
Chad	139	148	143	139	136
Guinea	141	147	144	140	119

Figure 16: Competitiveness Rankings in Central Africa
Source: *Author's Compilation from Global Competitiveness Report (2018)*

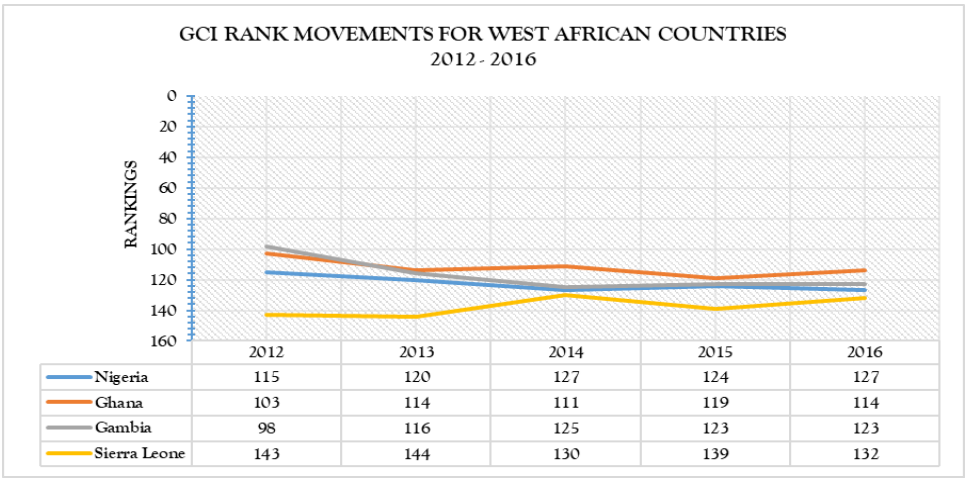
Figure 16 shows Cameroon as the most competitive Central African economy, though it dropped in the GCI ranking from 112th in 2012 to 119th in 2016.

Gabon declined from 99th position in 2012 to 108th position in 2016. Guinea moved significantly up the rankings from 141st in 2012 to 119th in 2016. Chad fell by3 places form 139th in 2012 to 136th in 2016.



	2012	2013	2014	2015	2016
Ethiopia	121	118	109	109	108
Kenya	106	96	90	99	96
Tanzania	120	125	121	120	116
Rwanda	63	66	62	58	52

Figure 17: Competitiveness Rankings in East Africa
Source: *Author's Compilation from Global Competitiveness Report (2018)*



	2012	2013	2014	2015	2016
Nigeria	115	120	127	124	127
Ghana	103	114	111	119	114
Gambia	98	116	125	123	123
Sierra Leone	143	144	130	139	132

Figure 18: Competitiveness Rankings in West Africa
Source: *Author's Compilation from Global Competitiveness Report (2018)*

Rwanda is the most competitive East African economy as shown in figure 17 above, and also made some gains on the GCI rankings, moving from 63rd

position in 2012 to the 52nd spot in 2016. Kenya, Tanzania, and Ethiopia all made upward movements in the GCI rankings. Kenya moved up 10 places from 106th in 2012 to 96th in 2016. Ethiopia moved 13 places up the rankings from 121st in 2012 to 108th in 2016. Tanzania rose from 120th in 2012 to 116th in 2016.

With the exception of Sierra Leone, figure 18 shows that all other West African countries fell down the GCI rankings. From 143rd in 2012, Sierra Leone moved up to 132nd in 2016. Nigeria fell steadily from 115th in 2912 to 127th in 2016. Gambia fell steeply from 98th in 2012 to the 123rd spot in 2016. Ghana fell 11 places from the 103rd spot in 2012 to 114th spot in 2016.

The two highest rankings from the 20 African economies dealt with is South Africa (ranked 47th in 2016) and Rwanda (ranked 52nd in 2016). Most other economies performed poorly either by being far down the rankings or falling steeply during the period under review. The dismal competitive performance of the AU countries region is not far-fetched, given that the indices with which the competitive index is computed are very bleak for the member countries. Thus, AU countries have performed more poorly compared to other countries resulting from weak and corrupt institutional machineries, huge infrastructural deficits, unfavourable macroeconomic conditions, poor human capital development, inefficient markets, as well as low levels of business sophistication and innovation.

Review of Relevant Literature

The conventional models of international trade theory used to study the processes involved in securing and maintaining international competitiveness are the Ricardian, Heckscher-Ohlin, contemporary standard trade, and industrial organisation models (Smit, 2010; Ossa, 2011; Gandolfo, 2013; Feenstra, 2015; Shiozawa, 2015; Viner, 2016; Jones & Kierzkowski, 2018).). In these theories/models, the major factor for international competitiveness are trade balance and terms of trade (Fatima, 2010; Kamar, Bakardzhieva, Naceur & Naceur, 2010; Leamer & Stern, 2017).

In line with the conventional models of international trade theory, a few studies have looked at the subject matter of international competitiveness. Using a sample of selected African economies especially in the Franc Zone, Agbor and

Taiwo (2014) examined the determinants of international competitiveness. Using a sample of 40 countries for a period of 1980 – 2011, pooled OLS model, fixed effects model and random effects model were estimated to capture how competitiveness is determined by 8 variables capturing factor conditions, demand conditions, state of infrastructure, trade intensity, as well as governance. The pooled OLS model showed that domestic demand and factor conditions, as well as infrastructure exerts significant positive impact on competitiveness of African economies, while governance was found to have a significant negative impact on competitiveness of African economies. The random effects model confirmed the above results, but indicated further that FDI exerts a significant positive impact on competitiveness of African economies. The fixed effects model replicated same results as the random effects model.

In the case of Central and Eastern Europe (C.E.E.) countries, Rusu and Roman (2018) investigated the determinants of competitiveness using an 8-variable model, estimated using a sample of ten C.E.E countries, and a data set spanning 2004 – 2016. The global competiveness index was regressed on growth rate of the GDP, tax rate, FDI, inflation rate, labour productivity, foreign trade, and cost of business start-up procedure. Empirical estimates, from pooled OLS, fixed effects, and random effects models were provided for three groupings of C.E.E. countries grouped into: the Efficiency-driven Economies, Transition economies, and Innovation-driven Economies. Regarding the Efficiency-driven economies, the growth rate of the GDP was found to be an insignificant determinant of competiveness in all three models. Inflation and cost of business start-up were found in all three models to have significant negative impact on competitiveness. Tax rate was shown to have a significant negative impact on competitiveness by the fixed effects model; Foreign Trade was shown to have a significant positive impact on competitiveness by the fixed effects model; labour productivity in all three models had significant positive impact on competitiveness while FDI in all three models had insignificant negative impact on competitiveness. Concerning the Transition economies, the growth rate of the GDP was shown to have a significant positive impact on competiveness by all three models; the random effects model showed inflation rate to have a significant positive impact on competitiveness; the tax rate exerts a significant negative impact on competitiveness, as shown by the fixed effects model; while all other variables were shown to have no significant impact on competitiveness. The results of the analyses for the innovation-driven C.E.E.

economies showed that the growth rate of the GDP had a significant positive impact on competiveness by all three models.

Using a sample of 53 developed and developing countries, Liu and Xu (2017) examined the national competitiveness implications of educational efficiency for the period 2000 – 2014. Based on 6 different models, competitiveness rankings from the World Competitiveness Yearbook (WCY) was regressed on educational efficiency, GDP per capita, energy intensity, high-tech exports, employment and population market size. While the first model contained all 53 countries, the other models were adjusted for the level of competitiveness from very strong to very weak. The result for the first model showed that educational efficiency had an insignificant negative impact on competitiveness; GDP per capita, high-tech exports and employment were found to exert significant positive impacts on competitiveness; population market size was found to have an insignificant negative impact on competitiveness; while energy intensity was found to have a significant negative impact on competitiveness. However, the result for countries with very weak or weak competitiveness showed that none of the explanatory variables had significant impact on competitiveness.

Staehr and Vermeulen (2016) employed the Vector Autoregression (VAR) approach to investigate the impact of competitiveness shocks on macroeconomic performance of 11 OECD countries. Using quarterly data from 1995 (Q1) to 2013 (Q4), four measures of competitiveness were regressed in four separate VAR models on the GDP, current account balance, and domestic credit. The impulse response functions indicated that the GDP seems to be affected more by competitiveness shocks, compared to the current account balance and domestic credit. In particular, it was found out that GDP declines for up to years when there is a worsening of the competitive parameters of an economy.

Based on West Balkan economies, Latja (2015) investigated the relationship between trade balance and competitiveness. Data for 5 countries for the period of 2011 – 2013 on the global competitiveness index (GCI), its pillars, and trade balance was subject to the Pearson correlation analysis. A correlation coefficient of 0.6057 ($p < 0.05$) was obtained, showing that there is significant strong positive correlation between GCI and trade balance. Results for the pillars indicated that there is a significant very strong positive correlation

between trade balance and both goods and market efficiency ($r = 0.9380$; $p < 0.05$), and business sophistication ($r = 0.8801$; $p < 0.05$). Trade balance was captured to have a significant strong positive correlation with both labour market efficiency ($r = 0.7541$; $p < 0.05$) and efficiency enhancements ($r = 0.6196$; $p < 0.05$). Health and primary education, technological readiness, and innovation were all shown to have very weak or weak correlations with the trade balance.

Hchaichai and Ghodbane (2014) empirically investigated the determinants of international competitiveness of Morocco, Tunisia, and Egypt. A data set spanning 1995 – 2010 was used to estimate an 8-variable model where exports (proxy for competitiveness) regressed on gross capital formation, nominal exchange rate, FDI, education expenditure, R&D expenditure, high-tech exports, and taxes of international trade. The fixed-effects estimate was the only model reported in the study, and it showed that education expenditure, R&D expenditure, and FDI all exert significant positive impact on competitiveness, while nominal exchange rate exerts a significant negative impact on competitiveness of the North African countries.

With focus on the Kenyan economy, Mutunga (2014) investigated how macroeconomic indicators affect sustainable competitive advantage in the food and beverage sector. The OLS estimation method was applied to primary data generated from a field survey, wherein sustainable competitive advantage was regressed on inflation, bank lending rate, and exchange rate. Preliminary analysis with the Pearson correlation analysis indicated no significant association between sustainable competitive advantage and the explanatory variables, with interest rate in particular having a negative correlation with sustainable competitive advantage. Main results from the regression analysis indicated that none of the macroeconomic factors exerts a significant impact on sustainable competitive advantage, with exchange and lending rates having negative impacts.

Masmoudi and Charfi (2013) examined the export competitiveness of Tunisia, with respect to macroeconomic factors. Using annual data spanning 1980 – 2011, a 9-variable model was estimated with the OLS, with the volume of exports as the predicted variable. The results showed that the export competitiveness of Tunisia is significantly increased by increases in custom duties on imports, high-tech imports, fixed capital formation, research and

development spending, and free trade with the EU. In contrast, export competitiveness of Tunisia is significantly decreased by increases in real effective exchange rate and inflows of foreign direct investment.

Ulman (2013) examined the implications of corruption for national competitiveness of 73 countries, which he divided into 2 groups that took into consideration the stage of development of the countries. In a cross-sectional analysis involving 3 separate models, the study employed both the Pearson correlation and OLS estimation method to see the relationship between a country's global competitiveness index (GCI - dependent variable), and its corruption perception index (CPI – predictor) – the factor-driven group (with 38 countries), and the innovation-driven group (with 35 countries). Data was obtained from the Global Competitiveness Index 2012-2013 and the Corruption Perceptions Index 2012. In the first model involving 106 non-grouped countries, the results indicated that strong positive correlation between improving corruption perception of a country and its national competitiveness. The regression estimates indicated that an improving corruption perception has a significant positive impact on the national competitiveness.

The review shows that the body of empirical evidence on the impact of intra-regional trade and macroeconomic factors on competitiveness, especially for African economies is scanty. The researchers are only aware of the empirical output of Abgor and Taiwo (2014) focusing on 40 African countries, and Hchaichai and Ghodbane (2014) who studied international competitiveness for Morocco. Egypt and Tunisia. Some other studies have studied competitiveness at the national levels (see Mutanga, 2014; Masmoudi & Charfi, 2013). What largely exists are anecdotal evidence, without much rigorous analytical depth, and therefore have not adequately measured the direction and magnitude of the impact of relevant factors on competitiveness in Africa. Thus, empirical evidence on the implications of intra-African economic realities for their competitiveness is lacking. These are some of the research gaps this study intends to fill.

Data and Methodology

Based on the conventional models of international trade theory (namely, Ricardian, Heckscher-Ohlin, contemporary standard trade, and industrial organisation models) and important studies in the literature such as Agbor and

Taiwo (2014), we specify the econometric models between Africa's Competitive Index and some of its macroeconomic determinants in the selected countries, and regions. An all-Africa global model will be estimates along with five others for each of the regions of Africa, to determine the relationship that may exist among these countries' and regions' trade indices and their competitiveness, including Imports, Exports, Inflation, Exchange Rate, Gross Capital formation and Real GDP growth rate. The empirical equation for estimation is given as:

$$ACI_{it} = \beta_0 + \beta_1 EXP_{it} + \beta_2 IMP_{it} + \beta_3 INF_{it} + \beta_4 NEXR_{it} + \beta_5 GCF_{it} + \beta_6 RGDPGR_{it} + \mu_{it} \qquad (1)$$

Where,

ACI: Africa competitiveness index of a region or country in a given year;
EXP: intra-African exports of a country or region in a given year;
IMP: intra-African exports of a country or region in a given year;
INF: inflation rate of a country or region in a given year;
NEXR: nominal exchange rate of a region or country in a given year;
GCF: gross capital formation of a region or country in a given year;
RGDPGR: growth rate of the real GDP of a region or country in a given year.

The above model is estimated using panel data from 20 African economies for the period of 2012 – 2016. The 20 economies were chosen on the basis of availability of data on their global competitiveness rankings and from the 5 geographical regions in Africa. Morocco, Algeria, Mauritania, and Egypt were selected from North Africa. South Africa, Zimbabwe, Zambia, and Malawi were selected from South Africa. Cameroon, Chad, Gabon, and Guinea were selected from Central Africa. Nigeria, Ghana, Gambia, and Sierra Leone were selected from West Africa. Ethiopia, Tanzania, Kenya, and Rwanda were selected from East Africa

The panel least squares was used to estimate both the global model (for all African countries sampled in the study as a whole), and separately for the 5 regions studied. The pooled, fixed effect and random effects models were reported for the global model. However, the adopted model was based on comparing the random effects and fixed effects model using the Hausman test. Based on the result of the Hausman test, the F-test or Breusch-Pagan LM test will determine if the pooled model is adopted (Torres-Reyna, 2007; Park, 2011). The random effects model could not be estimated for the regions, as the

number of variables exceeded the number of countries sample for each region. Data was sourced from the IMF Direction of Trade Statistics and World Bank Development Indicators for the countries.

Empirical Analysis and Discussion of Results

A total of 6 models were estimated using the Pooled OLS, Fixed Effect and Random Effect approaches. Table 2 presents the results of the three outcomes for the overall all-Africa model for the 20 sample economies used in the study.

Our choice of the result for interpretation was informed by the outcome of the diagnostic tests we carried out on the Pooled OLS, Fixed Effects and Random Effects (only for the overall model) models we estimated, to enable us to select the most appropriate models. In choosing between the Pooled OLS and the Random effects outcomes for the all-Africa model, the Hausman Test ($p > 0.05$) indicates that the random effects model is more appropriate than the fixed effects model. For the comparison between the random effects and the Pooled OLS models, the Breusch-Pagan LM Test ($p < 0.05$), shows that the random effects model is the more appropriate. Nonetheless, we present all the results in Table 2.

Table 2: Pooled OLS, Fixed-Effects and Random-Effects Models for the Global Model on Intra-African Trade and Macroeconomic Determinants of Competitiveness

Variables	All Africa Model (n = 20)		
	Pooled Model	Fixed-Effects Model	Random-Effects
Constant	3.501054**	3.639612**	3.583577**
EXP	0.000555	0.017899	0.026040
IMP	0.042634	-0.040363	-0.037313
INF	-0.013747*	-0.001810	-0.001777
NEXR	1.002985*	0.213742	0.243542
GCF	0.004049*	0.001476	0.002703
RGDPGR	0.004724	-0.001211	-0.001573
R^2	0.342918	0.940246	0.078190
F-statistic	7.654255**	45.89479**	1.244053

**p-value of t-value of coefficient and F-statistic < 0.05*

***p-value of t-value of coefficient and F-statistic < 0.01*

Hausman Test: Chi Square Statistic = 5.833952; p = 0.4420

Breusch-Pagan LM Statistic: 312.9281; p = 0.0000

Source: *Author's Computation*

The All-Africa Model

From the results, both intra-African exports (EXP) and imports (IMP) were found not to exert any significant impact on the competitiveness of African countries, with imports found to be negative. The insignificant positive impact of exports supports the finding of insignificant positive impact of trade openness on the international competitiveness of African economies by Agbor and Taiwo (2014). This result is also in accord with that of the random-effects model estimated by Rusu and Roman (2018), which returned an insignificant positive impact of trade on the international competitiveness of efficiency-driven Central and Eastern European (C.E.E.) countries, though there was a significant positive impact of trade on the competitiveness of innovation-driven C.E.E. countries. The insignificant negative impact of imports obtained comes close to the finding of insignificant negative impact of trade on the competitiveness of transition of C.E.E. countries. The result for the innovation-driven economies is instructive and underscores the importance of technology and innovation in the competitiveness of nations.

Inflation (INF), as expected, had a negative but insignificant impact. This comes close to the findings of the random-effects model by Rosu and Roman (2018) of a significant negative impact of inflation on the international competitiveness of the efficiency-driven C.E.E economies. It however conflicted with the findings of significant positive impact of inflation on the competiveness of transition-and-innovation-driven economies. The nominal exchange rate (NEXR) was found to have an insignificant positive impact on competitiveness, which is opposite of the findings of Hachaichi and Ghodbane (2014) of a significant negative impact of exchange rate on competitiveness of selected North African countries. Gross capital formation (GCF) was found to have an insignificant positive impact on competitiveness. This plausible outcome is close to the findings of Hachaichi and Ghodbane (2014) of a positive impact of gross capital formation on competitiveness of selected North African countries, though not statistically significant. The Growth rate of the real GDP was found to have an insignificant negative impact on the competitiveness of African economies, which is opposite the results of Rosu and Roman (2018) of a significant positive impact of GDP growth rate on the competitiveness for the transition and innovative-driven CEE economies. This result also conflicts the findings of Liu and Xu (2017) of a significant positive impact of GDP per capita on the competiveness of 53 countries. The result might not be unconnected with

the quality of growth we have in Africa, which is mostly not shared among the population.

The estimated random-effects model for Africa was able to explain 7.82% of the variations of in competitiveness. The overall significance of the model was poor as shown by the F-value of 1.244053, which was not significant at both the 0.05 and 0.01 levels of significance. The fixed effects and pooled OLS models however featured better results, as shown on table 2. We associate the seeming poor explanatory power of the model to the data challenges experienced in this study. The weak or poor impact of macroeconomic variables on competitiveness indicates the important role effective policy regimes could have on Africa's competitiveness.

Regional Results

Results of the five separate models estimated for the five African regions, using a sample of 4 countries for each region are interpreted subsequently. Random effects model could not be run for the regions due to data challenges.

North Africa

The F-test on table 3 shows a p-value of 0.1508, indicating that the pooled model is appropriate. Intra-African exports and imports were found to have insignificant negative impacts on competitiveness of North African economies. Nominal exchange rate, gross capital formation and growth rate of the real GDP were all found to have insignificant positive impact on the competiveness in the region, while inflation was found to have an insignificant negative impact.

Table 3: Pooled OLS and Fixed-Effects Models for North Africa000

Variables	North Africa Model	
	Pooled Model	Fixed-Effects Model
Constant	2.789510**	3.164137**
EXP	-0.163527	-0.056067
IMP	-0.068944	-0.130535
INF	-0.067094**	-0.029999
NEXR	7.137586**	5.172665
GCF	0.017229**	0.006036
RGDPGR	0.091292*	0.078710
R^2	0.916668	0.949821
F-statistic	23.83366**	21.03189**

**p-value of t-value of coefficient and F-statistic < 0.05*

***p-value of t-value of coefficient and F-statistic < 0.01*
F-Test: F Statistic = 2.202346; p = 0.1508
Source: *Author's Computation.*

The estimated random-effects equation explained 94.98% of the variations in competitiveness of the countries on the North African region, with F-statistic of 21.03189 confirming the overall significance of the model.

Table 4: Pooled OLS and Fixed-Effects Models for South Africa on Intra-African Trade and Macroeconomic Determinants of Competitiveness

Variables	South Africa Model	
	Pooled Model	Fixed-Effects Model
Constant	3.506005**	4.131319**
EXP	0.084481	-0.026006
IMP	-0.069226	0.035428
INF	-0.008726	-0.016216
NEXR	1.218800	-1.072320
GCF	-0.007578	-0.004074
RGDPGR	-0.009045	-0.006075
R^2	0.969284	0.976583
F-statistic	63.37121**	46.33707**

**p-value of t-value of coefficient and F-statistic < 0.05*
***p-value of t-value of coefficient and F-statistic < 0.01*
F-Test: F Statistic = 1.038973; p = 0.4169
Source: *Author's Computation*

South Africa

The F-test on table 4 shows a p-value of 0.4169, indicating that the pooled model is appropriate for South Africa. Intra-African exports exert an insignificant negative impact on competitiveness of South African economy, just like in the North African Region. Intra-African import was found to have insignificant positive impacts. None of the macroeconomic variable had a significant impact on the competitiveness of the region. This result is similar to the findings of Liu and Xu (2017) whose estimation results for weak and very weak competitive economies showed that none of the macroeconomic variables significantly impacts their competitiveness. However, the overall significance of the model was confirmed by the F-value of 46.33707, which explained 97.66% of the variations of the competitiveness of countries in the region. As in North Africa the insignificance of macroeconomic variables on Africa's competitiveness again underscores the need for economic policy reforms.

Central Africa

The F-test on table 5 shows a p-value of 0.0000, indicating that the fixed-effects model is appropriate. In this region, intra-African exports returned a significant negative impact on the competitiveness of the region. Intra-African imports exerted a significant positive impact on competitiveness.

Table 5: Pooled OLS and Fixed-Effects Models for Central Africa on Intra-African Trade and Macroeconomic Determinants of Competitiveness

Variables	Central Africa Model	
	Pooled Model	Fixed-Effects Model
Constant	1.825507*	3.754724**
EXP	2.513423**	-0.519036*
IMP	-0.330316	0.248639*
INF	-0.003098	0.014536**
NEXR	614.0192	-23.19927
GCF	-0.086162	-0.067853*
RGDPGR	0.040730	0.005795
R^2	0.780216	0.996689
F-statistic	4.733218*	225.7911**

**p-value of t-value of coefficient and F-statistic < 0.05*
***p-value of t-value of coefficient and F-statistic < 0.01*
F-Test: F Statistic = 196.16099; p = 0.0000
Source: *Author's Computation*

Both inflation and gross capital formation were found to be the only macroeconomic variables found to have significant impact (positive and negative,+ respectively) on the competitiveness of Central African economies. The estimated fixed-effects model was able to explain 99.67% of the variations in competitiveness of the region, with the overall significance of the model confirmed by the F-statistic of 225.7911 being significant at the alpha level of 0.05.

Table 6: Pooled OLS and Fixed-Effects Models for West Africa on Intra-African Trade and Macroeconomic Determinants of Competitiveness

Variables	West Africa Model	
	Pooled Model	Fixed-Effects Model
Constant	3.579523**	4.093341**
EXP	0.050343	0.018597
IMP	-0.511929*	-0.323135*
INF	-0.007791	-0.025727
NEXR	1.267138**	0.349544
GCF	0.006977	-0.007396
RGDPGR	0.004640	0.001837
R^2	0.793020	0.939256
F-statistic	8.301352**	17.18074**

**p-value of t-value of coefficient and F-statistic < 0.05*

***p-value of t-value of coefficient and F-statistic < 0.01*

F-Test: F Statistic = 8.024786; p = 0.0051

Source: *Author's Computation*

West Africa

The F-test on table 6 shows a p-value of 0.0000, indicating that the fixed-effects model is appropriate. In the West African region, intra-African imports was found to have a significant negative impact on the competitiveness of the countries, while intra-African exports was found to exert an insignificant positive impact on competitiveness of West African countries. Although, the estimated model explained 93.93% of the variations in competitiveness of the West African region, none of the macroeconomic variables significantly positively impacted competitiveness. The F-value of 17.18074 confirmed the significance of the model at both the 0.01 and 0.05 alpha levels.

East Africa

The F-test on table 6 shows a p-value of 0.0149, indicating that the fixed-effects model is appropriate. The results indicate that intra-African exports exert insignificant positive impact on the competitiveness of East African economies, while intra-African import exerts a significant negative impact. Nominal exchange rate was found to be the only macroeconomic variable significantly impacting competitiveness but negatively. The estimated model captured 90.15% of the variations in competitiveness, while the overall model was found to be significant given the F-value of 19.82555 being significant at both the 5% and 1% levels of significance.

Table 7: Pooled OLS and Fixed-Effects Models for East Africa on Intra-African Trade and Macroeconomic Determinants of Competitiveness

Variables	East Africa Model	
	Pooled Model	Fixed-Effects Model
Constant	4.639885**	4.247613**
EXP	0.000834	-0.061427
IMP	-0.481275**	0.000684
INF	-0.004351	-0.006116
NEXR	-13.43256*	-23.29695
GCF	0.014331	0.007312
RGDPGR	-0.026491	0.003024
R^2	0.901480	0.963901
F-statistic	19.82555**	29.66871**

**p-value of t-value of coefficient and F-statistic < 0.05*

***p-value of t-value of coefficient and F-statistic < 0.01*

F-Test: F Statistic = 5.763293; p = 0.0149

Source: *Author's Computation*

Conclusion and Recommendations

The importance of increased interaction among African countries, particularly in their import and export trade, has been further highlighted by this research. Inter-African trade, both intra- and interregional trade among African countries, have historically been quite low, according to several research findings, and this has reflected very clearly in the outcomes of this research. This study therefore found that intra-African trade is of low significance to the competitiveness of most of the continent's regional groups, and by extension, the entire continent. This could be attributed to the very low levels of trade existing among member countries. The study recommends that African nations should focus on reversing the current trend of trading more with the rest of the world than they do among themselves in order to improve its competitiveness.

The impact of macroeconomic factors on the competitiveness of African economies was also found to be low. Several unfavourable macroeconomic realities of Africa, including wide disparities in policies and economic structures, and policy instability, have had dampening effects on its competitiveness, as shown by the fixed effects and random effects models. This insignificance of macroeconomic variables was evident in North Africa, South Africa and East Africa regions' results. Furthermore, the dominance of primary produce in African exports, and her weak industrial base, which fuel import

dependence, serviced by non-African countries, may have contributed to the weak impact of intra-African trade on its competitiveness. This is further reinforced by the fact that most member countries have identical exports in the form of primary produce, while their imports come from the industrialised countries. These outcomes point to the urgent need to seriously diversify the local economies to promote more intra-and inter-regional trade.

The observed variation in their level of impact of macroeconomic variables among the regions indicates that improved macroeconomic policy delivered in a coordinated manner, could improve Africa's competitiveness. The study strongly recommends this policy coordination. It is also an indication that Africa can significantly improve its competitiveness if appropriate steps are taken to improve institutions and systems. The results for the East Africa region, which contain the most competitive African country, Rwanda, and in which intra-African exports exert insignificant positive impact on the competitiveness of East African economies indicates the existence of substantial benefit in improved economic management. It is recommended that African countries should harmonise their trade policies with emphasis on enhance intra-African trade and cooperation. The absence of stable macroeconomic policies and rampant policy summersaults tend to weaken the capacity of members to benefit from their many years of economic integration. This should be the focus of new policy initiatives on trade. To reduce the negative influence of weak institutions on its competitiveness, African nations must work effectively to enhance the identity and stature of its institutions, and build structures rather than strong personalities.

Generally, the macroeconomic variables used in the study, such as exchange rate, gross capital formation, growth rate of GDP and inflation, were The largely insignificant effect of the variables on the competitiveness of African economies suggests the need to focus on trade-enhancing policies in order to drive competitiveness of African economies. It is further recommended, that efforts be made to expand their industrial bases and improve export capacity among members. This should entail a new strategy for economic diversification towards manufactures as most members are lacking in that area. In addition, African nations must make the right policy choices, ensure policy consistency and harmonise their macroeconomic action even at the Africa Union level, as a strategy for improving the competitiveness of African economies.

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