

**AFRICA'S DEVELOPMENT AND THE GLOBAL TRADING SYSTEM:  
CHALLENGES AND OPTIONS**

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## **AFRICA'S DEVELOPMENT AND THE GLOBAL TRADING SYSTEM: CHALLENGES AND OPTIONS**

### **Abstract**

*This paper empirically explored development in Africa in relation to the global trading system (trade and tariff) using panel data technique. It examined the economic development of African economies in relation to the countries' regional grouping and also assessed Random Effects (RE) and Generalised Method of Moments (GMM) estimates. The results established, among other things, that sub-regions with higher level of domestic investment had higher values in economic development indicators. It was also found that domestic investment and labour played a more crucial role in Africa's economic development process. The challenge noted was the fact that increased trade integration do not translate to increased economic development in Africa. Thus the option is to improve domestic investment and enhance labour productivity, which are more crucial for economic development than trade and tariff.*

**Key words:** Economic development, Export, Tariff, Trade.

**JEL Codes:** F11, F31.

## 1 Introduction

The impact of the global trading system trade has generated intensive debate among academic commentators, but the impact on developing countries especially within Africa has helped to fuel the contention. Some scholars advocated for trade liberalisation as a prerequisite for economic growth (Edwards 1997; David and Scott 2005). Stiglitz (2002) cautioned against drastic trade openness. Along these perceptions disparities, the African commodities oriented countries are in dilemma as World Trade Organization (WTO)'s tariff crusade makes the continent an *economic-lake*; importing and consuming a variety of products without significant improvement in exports.

Many African countries have instituted strategic vision aiming at 2020 as the developmental hallmark especially with a view of improving the welfare of their citizens and attaining meaningful development. However, some countries anchored their developmental strategy on the expansion of primary product exports, which may not yield much result. This is because the price of primary products at the international market is easily affected by unfavourable terms of trade. The occurrence of recent global economic crisis that has resulted in decrease in commodity prices lends credence to this stance. This, among other reasons, may be instrumental in development '*lukewarmness*' experienced in many African countries even when most of them have had 50 years of political independence. For instance, while many countries of the world have recorded steady improvements with regards to human development in the past years, many African countries suffered human development reversals from which they are yet to recover (Human Development Report -HDR 2009).

Tariff and trade may or may not favour countries at the same rate due to difference in economic structures. This should be understood as a system error, that economic development is both interrelated and interactive. The advantage experienced by the developed countries within the international trading system, which has made improvements in the welfare of their citizens create an element of hierarchy within the global system. Hence, instead of comparative advantage, it is somewhat *selective-advantage* while there could be possibilities of complementary trade-off. The current trade exhibits characteristics of *have-nots* for Africa despite participation in trade. Hence, the

promise of world trade benefits for Africa remains unfulfilled. For instance, the total trade for services for Africa in 2007 was 3 per cent compared to that of Asia of 24 per cent and average contribution of Sub-Saharan Africa (SSA) to world total export in 2008 was modicum of 0.05 per cent compared to the global average of 0.64 per cent (World Bank Group 2010).

The above is crucial given the targets in Millennium Developmental Goals (MDGs). Some African countries have made some efforts in that regard but much success has not been recorded in many respects especially in economic and human development. Africa had some signs of impressive economic performance as the real per capita GDP in the first half of 1970s where Africa's 2.7 per cent growth rate (1970 to 1974) was similar to that of Latin America and Caribbean and even higher than South Asia. However, Africa has had some disappointing records in development in recent times. For instance, Africa had the lowest value of real per capita GDP for the period 2005 to 2008 compared to other regions of the world (World Bank Group 2010). On a similar note, human development index (HDI) for Africa was in the very low ebb compared to other regions of the world. The average HDI for Sub-Saharan Africa was 0.389, which was far lower than world average of 0.624 in 2010 (HDR 2010). This paper was motivated with a view to examining the extent to which trade and tariff issues are relevant in explaining economic development in Africa.

In articulating this, 50 African countries were selected, which covered good representation of the five sub-regions, namely: Central, East, North, Southern and West Africa. Data sourced from HDR, World development Indicators (WDI), and World Trade Indicators (WTI) were analysed using both descriptive and econometric techniques. The rest of the paper is structured as follows: some stylised facts; theoretical underpinning and literature review; empirical model formulation; presentation of econometric results and analyses; and conclusion.

## **2 Stylised Facts on Development, Tariff and Trade**

Table 1 gives some stylised facts on trade and development nexus across some regions of the world including Africa from 1970 to 2008 using some period averages. This is with a

view to further situate the nexus on development, trade and tariff in Africa within the global context. The information on tariff was for the period 1995 to 2008 while that of HDI was 1980 to 2010; periods that data were available. Trade outcome indicators using total trade integration ratio (*trade as % of GDP*) and export integration ratio (*export as % of GDP*) are shown in Part A and B of Table 1, while growth rates of real per capita GDP and population are in Part C and D, respectively. Segments E and F report data on tariff and HDI in Africa in comparison to other regions and global average.

From Table 1, Africa's trade in the early 1970s was relatively at par with some other regions presented and but it was even above South Asia using both indicators. There were little fluctuations along the line; however, during the period 2000 to 2008, Africa seems to have integrated very much in trade as its value of 38.28 per cent was very close to that of Latin American and the Caribbean with the value of 38.48 per cent. It was even above that of South Asia that has the value of 29.33 per cent. More so, the value of Africa's real per capita income for the period 1970 to 1974 was far above that of South Asia (almost five times) and a little lower than that of Latin America and the Caribbean. The irony is that towards the end of the period (2005 to 2008) Africa had the lowest real per capita income amongst all the regions. The above is converse to its population growth rate that has the highest value all through the period.

With respect to tariff, segment E of Table 1 indicates that the average applied tariff had consistently reduced in Africa. For instance, the average for 1995-1994 was 22.44 per cent which significantly reduced to 12.79 per cent for the period 2005 to 2008. In addition, this paper presents another indicator of development, which incorporates the human aspect of development (HDI). The HDI is composite measure of human development entailing measures of living a long and healthy life (life expectancy), level of education (adult literacy rate, enrolment rate and years of schooling) and decent living standard (gross national income per capita at purchasing power parity). As can be seen segment F of Table 1, values HDI for Africa was lower than those of other regions as well as the global average all through the period 1980 to 2010.

**Table 1 Development, Trade and Tariff Indicators across the World**

Period ⇒	1970-74	1975-79	1980-84	1985-79	1990-94	1995-99	2000-04	2005-08	1970-08	
Regions √	(A)	Trade as % GDP								
East Asia & Pacific	64.51	70.23	77.04	78.99	87.80	94.27	115.23	138.52	90.17	
Latin America & Caribbean	59.16	81.31	80.65	78.17	85.01	85.60	85.34	86.75	79.59	
South Asia	24.18	77.85	80.76	50.54	58.23	65.96	64.04	48.27	59.71	
Africa*	58.72	69.84	69.50	65.64	65.54	72.33	77.47	83.36	69.50	
	(B)	Export as %GDP								
East Asia & Pacific	36.09	34.32	34.06	33.64	38.27	43.40	55.84	69.07	42.48	
Latin America & Caribbean	28.38	37.27	35.49	36.42	39.11	38.52	38.24	38.48	36.53	
South Asia	10.26	33.71	33.50	22.64	26.15	31.81	31.38	29.33	27.71	
Africa	27.32	29.08	28.22	28.02	27.01	30.61	35.16	38.28	30.12	
	(C)	Real Per Capita GDP Growth (%)								
East Asia & Pacific	5.37	3.90	2.17	2.15	3.51	2.06	2.13	4.35	3.57	
Latin America & Caribbean	3.31	2.71	-0.04	1.81	1.55	2.07	1.24	3.61	2.13	
South Asia	0.54	2.40	3.75	2.89	2.64	2.82	3.84	3.75	2.85	
Africa	2.66	0.91	-1.01	1.18	-1.93	2.83	2.36	2.75	0.67	
	(D)	Population Growth (%)								
East Asia & Pacific	2.37	2.03	2.21	2.02	2.00	1.76	1.47	1.46	1.88	
Latin America & Caribbean	1.82	1.72	1.76	1.49	1.53	1.41	1.30	1.17	1.55	
South Asia	2.45	2.48	2.38	2.33	2.18	1.89	1.72	1.57	2.13	
Africa	2.48	2.77	2.90	2.81	2.33	2.61	2.37	2.26	2.64	
	(E)	Average Applied Tariff on All Goods (%)								
						1995-99	2000-04	2005-08	1995-08	
East Asia & Pacific						15.96	9.80	9.83	12.01	
Latin America & Caribbean						13.64	11.67	8.22	11.39	
South Asia						29.76	18.53	14.33	21.34	
Africa						22.44	14.93	12.79	17.00	
Global Average						11.93	10.24	9.35	10.59	
	(F)	Human Development Index (HDI). Values range from 0 to 1; the higher, the better.								
			1980	1990	1995	2000	2005	2009	2010	
East Asia & Pacific			0.383	0.446	0.519	0.559	0.600	0.636	0.643	
Latin America & Caribbean			0.573	0.614	0.640	0.660	0.681	0.699	0.704	
South Asia			0.315	0.387	0.415	0.440	0.481	0.510	0.516	
Africa			0.293	0.354	0.358	0.315	0.366	0.384	0.389	
Global Average			0.455	0.526	0.554	0.570	0.589	0.619	0.624	

**Note:** \*Africa largely denotes Sub-Saharan Africa.

**Source:** Human Development Reports (2010); World Development Indicators (2009), World Trade Indicators (2010).

The summary from the stylised facts above concludes: a) Africa is becoming increasingly more integrated in trade; b) Africa is fast becoming the least region with respect to economic development; c) Africa has the highest population growth; and 4) Africa's average applied tariff has reduced consistently and remarkably. The above observations can help to infer that Africa with high population growth experienced less economic development and more importantly the increasing Africa's trade integration do not reflect significantly in development process of the continent. This discourse brings some issues to limelight: the possible nexus between trade and economic development.

### **3 Theoretical Underpinning and Literature Review**

There is a general assertion that cross-countries trade is imperative for economic growth and to some extent economic development. This conclusion has been fostered by some empirical and theoretical studies (e.g. Dollar 1992; Sachs and Warner 1995; Edwards 1997; David and Scott 2005). Also, Grossman and Helpman (1995) presume that the world integration has an influence on the entrepreneurs which directly impact the social fabrics of countries economic system. Hence, it is conventionally accepted that trade openness is a vital component of economic growth and development (Winters 2004; Mackay and Winters 2004).

Past studies offer some insights into the relationship between the trade, other factors and economic growth and development. However, the studies have divergent conclusions (Ackah and Morrissey 2010). The thrust of Solow (1956) argument was that market-centred trade liberalisation will accelerate the dynamic of economic growth and development. With respect to individual productivity pay-off, the aggregate market interactions were to trigger growth, which is in accordance with the neoclassical theory of trade and growth (Bhagwati 1988).

The progress in trade is becoming even more important in the analysis of economic growth as well as development. Thus, it is necessary to examine theoretical and empirical evidences towards substantiating the claims of WTO that the removal/reduction of tariff influences economic growth. Some authors such as Berg and Krueger (2003) and Mackay

and Winters (2004) give reasons for trade liberalisation, and its propensity to promote economic growth. These cross-countries empirical studies conclude that the liberalisation of world trade has impacted significantly the economic growth of countries.

Mackay and Winters (2004) observed that the importation of capital goods and technological goods create knowledge spill-over which increases international competition. Through competition, trade is believed to enhance growth and concomitantly leads to variety of goods availability at cheaper prices. The modern trade theory developed by Helpman and Krugman (1985) and the new growth theory by Grossman and Helpman (1991) illustrate that the benefits from trade is a fundamental argument for free trade which makes it instrumental for economic growth. Although these studies were Western-based, some economists believe that the argument for freer trade provides significant incentives for developing countries (Srinivasan 2000 and Stiglitz, 2002).

In a similar manner, some empirical studies have related trade and trade issues to wealth accumulation (Levine and Renelt 1992; Taylor 1998). In another perspective, Tilat (2002) concludes that trade has no significant association with long-term economic growth and suggested that short-run effects out-weigh the perceived benefits of trade liberalisation. However, Mackay and Winters (2004) found that in the short run, trade liberalisation harms poor actors in the economy and even in the long run, successful open countries may create a return to below the poverty line, which means an escalation in poverty density and a punctured economic growth.

The traditional theory of trade as illustrated by Stolper-Samulson reveals that an increase in the relative price of a commodity results a corresponding increase in the real-return to factors utilised in producing that commodity (Dixit and Norman 1980). However, some of the literature did not examine the possibility of 'Goliath-David trade' to plummet economic growth. Unfortunately for most Africa countries, the expected benefits of international trade have not been sufficiently experienced; hence it is not difficult to link trade openness with a countries' economic less performance along e.g. primary extraction/commodities.



To investigate the relationships between trade openness through tariff removal to economic growth within Africa, the effects on total factor productivity is imperative. Studies show that reduction in trade barriers were followed by significant increases in total factor productivity (Winters 2004). This resulted from the increase in import competition according to Ferreira and Rossi (2001) with the study in Brazil, Jonsson and Subramanian (2001) in South Africa, and Kraay (1997) obtain inconclusive results for China, while Aw, Chung, and Roberts (1999) discovered little evidence for Latin America and Asia. However, the significance of these studies resonate the debate about whether agricultural commodities and primary extractions export for the poor countries in Africa is the option for tariff reduction.

Freer trade by absolute definition involves greater interdependence among countries, and Tilat (2002) linked it to the phenomenon of globalisation. Although reforms have been uneven, there is clear evidence that protection of import substitutes with tariffs and non-tariff barriers within Sub-Saharan Africa has declined significantly (Nash 1993). However, Africa's share in global exports reduced from 4.5 per cent in 1977 to 2.0 per cent in 1997, and also, Africa's share of total developing country exports dropped from 15.5 per cent in 1981 to 9.2 per cent in 1997 after many countries implemented the Structural Adjustment Program (African Development Bank 2008).

Nevertheless, the study of Agama (2001) in Africa which utilised a database to investigate the connection between trade openness and economic growth for 40 countries in Africa is subjective. Agama argues that between 1980 and 1999, the more open countries in Africa experienced higher economic growth rates than those that remained closed. Hence, concludes that although trade liberalisation and economic integration increases economic growth for African countries, increases in government consumption expenditure retards the growth. Most studies believe that a significant relationship exists between exports, measure of trade integration, and economic growth (Khalifa Al-Youssif 1997; Agama 2001) and cross-country study tends to confirm the importance of exports for developing countries (Ngoc, Phuong Anh, and Nga 2003). The doubts exist pertaining to the importance of trade. For example, Clarke and Kirkpatrick (1992) utilised data for 80 developing countries (1981 to 1988) to estimate the impact of trade policy reform on the

economic performance and conclude that trade reform does not affect profoundly the economic performance.

Theoretically, the profound implication of international trade on development especially along economic growth, income distribution, poverty, and employment are impressive (Krugman 1983; Bhagwati 2004). This is anchored on the economic theory that opines a completely liberalised global market constitutes the most efficient path to foster growth, because a particular country that specialises in producing the goods and services in which it has a comparative advantage gains from trade. Nonetheless, trans-national corporations have become instruments of eroding nations' comparative advantage since they dominate the global marketplace and create a non-flattened relation of power and information. Further, the problem is that free trade based on comparative advantage is not actually and equally free. For example, agricultural subsidies and other designed trade barriers common to the USA and some European countries can hinder Africa poor countries from entry and participating in these vital markets despite the comparative advantage concept.

The debate about a positive empirical association between trade and economic growth especially within the Africa domain remains far from being over. In spite of the recent movement towards trade reforms for most Africa countries, there remain some major controversies regarding certain aspects of trade and the message of WTO. The effects of trade tariff removal/reduction and economic growth appear to be direct and imperative for some selected Africa countries. To contribute to the academic debate and to recommend some policies for Africa leaders, this paper examines the relationship between trade, tariff reduction and economic growth and development among selected Africa countries (1995-2008).

#### **4 Empirical Model and Estimation Technique**

The model for this paper, as informed from literature and the theoretical framework and is discussed in the section. It draws insights from endogenous growth theory (also referred to as Neo-classical theory) that has labour and capital as basic explanatory factors for growth and also allows the incorporation of other variables of interest. The model

assumes a relationship between indicators of development of selected African countries and capital, labour with the inclusion of other explanatory variables especially trade and tariff. This is based on growth literature (e.g. Agama 2001; Stiglitz 2002; Winters 2004) that have established the influence of trade on economic growth in some countries.

It is commonly purported that the more countries are open to trade, the better their level of economic development. Thus, a functional relationship between economic development (usually proxied by per capita income) and trade can be related. It has been argued that real per capita income covers mainly the economic growth. To handle this, this paper employs HDI, which incorporates other aspect of economic development especially human component. The key explanatory variables of interest that can exert influence on development are trade and tariff. This is represented by the functional relationship below:

$$EDevt^J_{it} = f(Lab_{it}, Invest_{it}, Trade^K_{it}, Trdgrot_{it}, Apt_{it}, U_{it}) \text{-----} 1$$

The above equation is expressed in explicit form as:

$$EDevt^J_{it} = \alpha_0 + \alpha_1 Lab_{it} + \alpha_2 Invest_{it} + \alpha_3 Trade^K_{it} + \alpha_4 Trdgrot_{it} + \alpha_5 Apt_{it} + e_{it} \text{-----} 2$$

Where:

*EDevt<sup>J</sup>*: Economic development in the selected countries. *J*=1 and 2. This represents two equations: the real per capita GDP, *rpgdp* (economic aspect of development) and human development index, *HDI* (the human aspect of development). *rpgdp* is measured at 1990 constant prices in United States dollars (USD), while HDI is taken as reported in HDR with values ranging from 0 to 1; the higher, the better.

*Lab*: Labour force measured in million persons.

*Invest*: Domestic investment proxied by gross fixed capital formation measured in million USD at 1990 constant prices.

*Trade<sup>K</sup>*: Trade integration, with *K* =1 and 2. This is measured by total trade openness/integration, *trdint* (defined as ratio of total trade to GDP) and export integration, *expint* (defined as ratio of export to GDP). These are the key measures of trade integration with the third as import integration (import/GDP). However, it has been noted that the first two measures are expected to positively influence growth and development but the impact of import integration is ambiguous (Leyaro and Morrissey 2010). Hence, this paper used *trdint* and *expint*.

*Trdgrot*: Real growth in trade, which shows rate of growth in trade over a given period. The inclusion of this variable is necessitated with a view to examining the influence of real trade growth over the studied period as it is possible to have trade integration without real trade growth.

*Apt*: Average applied tariff.

$e_{it}$ : Error terms that captures other factors influencing the dependent variables that are not included in the model. They are assumed to be identically and independently distributed (iid) with zero mean and constant variance  $N(0, \sigma^2)$ .

*it*: The countries and time dimensions.

$\alpha_i (i = 0 - 5)$ : Parameters to be estimated, which show the constant and the rate of change in the dependent variable induced by the respective chosen explanatory variables. Their a priori expectation is such that  $\alpha_i (i = 0, -4) > 0$ . This means that the explanatory variables are expected have positive influence on the indicators of development. Tariff can be positive or negative depending on the economies.

To estimate the formulated model, the paper used a panel data regression technique. Panel data regression technique is a relevant method of longitudinal data analysis because it allows for a number of regression analyses in both units and time dimensions. It also gives room for data analysis especially when the data are from various sources and the time series are quite short for separate time series analysis (Baum 2006). In panel data analysis, there are usually choices to be made from three possibilities: pooled Ordinary Least Squares (OLS) regression, Fixed Effects (FE), and the Random Effects (RE) models. However, there are some issues such as omitted variables, unobserved heterogeneity, measurement errors and endogeneity biases (Baum 2006; Leyaro and Morrissey 2010). To address them, the Generalised Method of Moments (GMM) estimator was employed. GMM procedure allows freedom in specifying the lag structure for the instruments.

The data used were sourced from World Development Indicators (WDI); World Trade Indicators (WTI); United Nations Statistics; and Human Development Reports. The period covered was 1995 to 2008 based on availability of relevant data, while STATA 10.1

program was used in the estimation process. The results from OLS, FE, RE and GMM are reported and analysed in the next section.

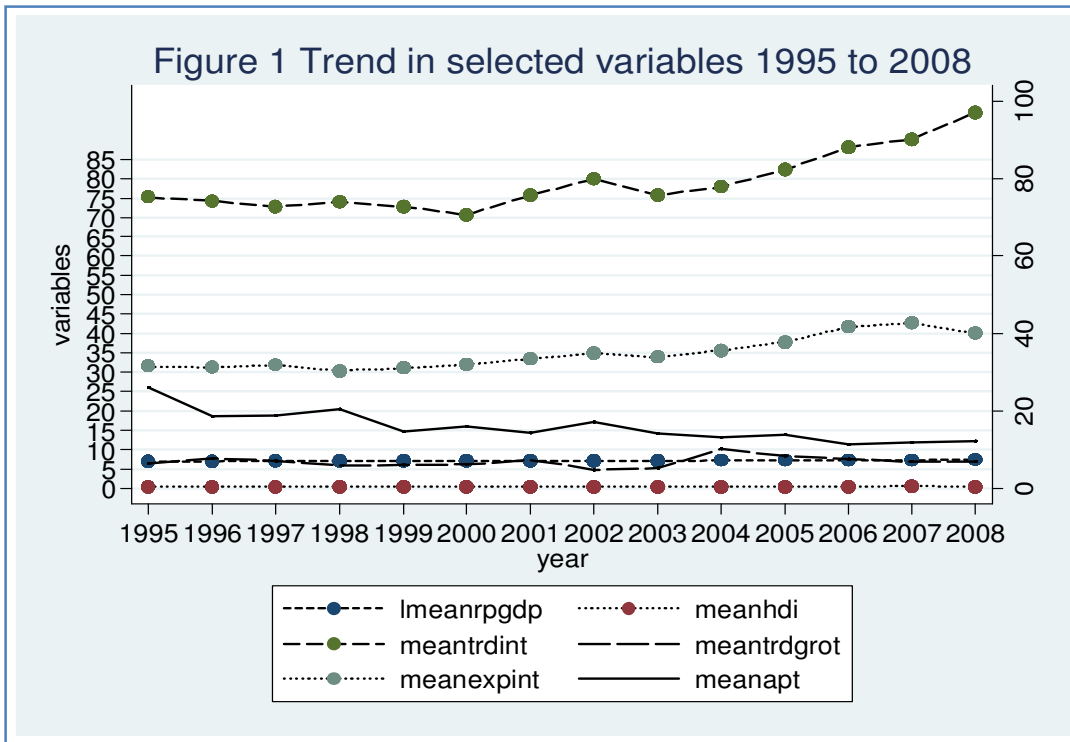
## **5 Empirical Results and Analyses**

The number of countries in Africa selected was 50 drawn from the five sub-regions in the continent, namely: Central, East, North, Southern, and West Africa. The selected countries represent about 87.72 per cent in number and over 95 per cent in economic size with respect to GDP and population. Thus, this will give a good representation. The list of countries selected arranged according to their sub-regions is reported in Table A1 in the appendix.

### **5.1 Descriptive Analysis**

To have first-hand information of the key issues, the paper plotted the major variables of interest as shown in Figure 1.

As can be observed in Figure 1, indicators of trade, namely trade and export integration ratios increased remarkably throughout the period, though they experienced little fluctuation during the period 2000 to 2003. On the other hand, indicators of development, namely real per capita GDP and HDI maintain a somewhat minimal increase over the period. However, average applied tariff decreased markedly and consistently over the same period. The above finding implies that Africa has experienced some form of increased trade integration and declined tariff rate but the level of development has not considerably improved. This denotes the challenge of Africa's trade inability to translate to development.



**Note:** Mean values were used for the graph; logarithm of *rpgdp* was taken to get the rate.  
**Source:** Authors' computation.

## 5.2 Summary of Statistics

The paper reports the summary of statistics of the variables used in the estimation process with a view to making comparison across the five sub-regions in Africa, namely: Central, East, North, Southern, and West; and make discussion on them. This is reported in Table 2.

Values in Table 2 show that the mean of real per capita GDP for the 50 sampled African countries was USD 1308.19; while across the sub-regions, it was highest in North Africa, which was about twice the means of other regions, while the least was in West Africa. A related observation is seen for HDI that was 0.50 for Africa, which was even lower for Central Africa with the value of 0.48. On the other hand, both measures of trade integration indicate that Southern Africa was more integrated in trade than the rest of Africa, which was followed by North with the least being Central. Real growth in trade was

higher in Central Africa distantly followed by North, Southern, East, and West Africa, respectively.

**Table 2 Summary Statistics of Selected Variables**

<i>Variables</i>	<i>Statistics</i>	<i>Africa</i>	<i>Central</i>	<i>East</i>	<i>North</i>	<i>South</i>	<i>West</i>
<i>Rpgdp</i>	Mean	1308.19	1314.62	1360.29	3030.91	1535.92	552.87
	Std. Dev.	1815.84	1782.50	2260.02	2654.32	1298.36	322.12
<i>Hdi</i>	Mean	0.50	0.48	0.51	0.69	0.53	0.44
	Std. Dev.	0.13	0.13	0.13	0.08	0.11	0.25
<i>Trdint</i>	Mean	78.96	71.46	74.55	72.98	105.82	72.80
	Std. Dev.	44.59	50.75	48.03	26.24	47.87	33.66
<i>Trdgrot</i>	Mean	6.94	9.99	6.13	6.58	6.52	6.11
	Std. Dev.	13.06	18.11	11.64	6.47	10.24	13.21
<i>Expint</i>	Mean	34.87	33.35	29.69	38.49	49.39	29.98
	Std. Dev.	22.89	27.38	23.92	17.57	26.24	12.44
<i>Apt</i>	Mean	14.78	17.17	15.50	14.05	11.57	15.36
	Std. Dev.	8.08	2.76	8.20	7.45	6.43	10.63
<i>Invest</i>	Mean	2680.00	904.00	1220.00	11500.00	4760.00	694.00
	Std. Dev.	6260.00	926.00	1580.00	6950.00	11100.00	800.00
<i>Lab</i>	Mean	6.58	4.51	9.21	10.00	4.82	5.81
	Std. Dev.	8.30	5.77	9.22	7.56	4.92	9.81
<i>Observations(N)</i>		700	126	168	70	126	210

**Note:** Only mean and standard deviation were reported for brevity sake.

**Source:** Authors' computation.

Conversely, the mean values of applied tariff indicate that Central African sub-region has the highest tariff rate followed by East, West, North and South, in that order. Table 2 points out that the average domestic investment was highest in North African sub-region with value that was more than 10 times above those of West and Central African sub-regions. In terms of labour force, the highest was in North Africa followed by West. The inference that can be made from the discussion on the summarized statistics is that the regions with higher level of domestic investment, as well as labour force seem to have higher values in development indicators. This does not hold for tariff and trade given the fact that sub-regions had higher values in trade integration and real growth in trade do not necessarily reflect better indicators of development.

### **5.3 Correlation Test of Variables**

Taking a step further before presenting the estimation result, the paper reports the correlation matrix to examine possible problem of collinearity among the explanatory

variables. The variables except real growth in trade were used in their logarithmic forms given the assertion that this process helps to mitigate the issue of heteroscedasticity and also brings the variables to a more comparative form (Olokoyo, Osabuohien and Salami 2009).

**Table 3 Coefficient of Correlation among the Variables**

	<i>lnrpgdp</i>	<i>lnhdi</i>	<i>lntrdint</i>	<i>trdgrot</i>	<i>lnexpint</i>	<i>lnapt</i>	<i>lninvest</i>	<i>lnlab</i>
<i>lnrpgdp</i>	1.0000							
<i>lnhdi</i>	0.8348	1.0000						
<i>lntrdint</i>	0.4243	0.4948	1.0000					
<i>trdgrot</i>	0.0266	0.0032	0.0696	1.0000				
<i>lnexpint</i>	0.5359	0.5425	0.8308	0.0590	1.0000			
<i>lnapt</i>	-0.1047	-0.2526	-0.0878	-0.0827	-0.0590	1.0000		
<i>lninvest</i>	0.4425	0.4614	0.0004	0.0740	0.1743	-0.2358	1.0000	
<i>lnlab</i>	0.2875	0.2625	0.1849	0.0512	0.1937	0.0250	0.1877	1.0000

Source: Authors' computation.

The values in Table 3 show that the two measures of economic development, namely: real per capita income and HDI exhibit strong correlation between them. This is not unexpected as they give interpretation on level of economic development. Since both of them are used differently as dependent variables, it does not pose any challenge. This observation is also similar to correlation between trade and export integration ratios, which necessitate their usage differently in estimation process. In addition, their separate use helps to ascertain, which of the two measures are more relevant for Africa's economic development process.

Surprisingly, the coefficient of correlation between trade and tariff was very minuscule (far less than 0.1), which implies that they can be combined together without problem of multicollinearity as the issue of multicollinearity becomes crucial when the coefficient of correlation becomes high, say above 0.5 (Baum 2006). This is quite surprising given the fact that tariff should have been expected to influence trade; the reason for this especially in Africa is sufficient for another research. In summary, the correlation test has shown that there is no challenge of multicollinearity among the explanatory variables and as such



the estimated results can be relied upon for useful deductions. Other tests before the estimation would have been panel unit root and panel co-integration tests. However, given the fact that GMM was among the estimators engaged which uses difference in the variable, these pre-test are not always essential (Leyaro and Morrissey 2010). Hence, the paper reports and analyses the estimated results in the next sub-section.

#### **5.4 Presentation of Estimated Results and Analyses**

Tables 4a and 4b present results from OLS, FE and RE and as well as GMM for the two indicators of economic development used as dependent variables, namely: real per capita income (*Lnrpgdp*) and human development index (*Lnhdi*), respectively.

The test statistics in the estimations in the last segments of Tables 4a and 4b, namely: coefficient of determination (*Adj. R<sup>2</sup>/R<sup>2</sup>*), F-Statistics (*F-stat*), Wald Statistics (*Wald-stat*) which were significant at 1 per cent denote that all the coefficients are jointly significant. For instance, the values of *Adj. R<sup>2</sup>/R<sup>2</sup>* in Table 4a were 0.8633, 0.5234 and 0.4459 for OLS, FE and FE, respectively using the equation with *Intrdint*, while those in Table 4b were 0.7672, 0.5660 and 0.5005. The values of *F-stat* for FE estimate was 38.00 and *Wald-stat* for RE and GMM estimates were 72.39 and 85.25 in Table 4a, respectively using the equation with *Intrdint*. Their counterparts in Table 4b in were 42.00, 85.74 and 87.18. The above discussion underscores the models good-fit. However, this does not address the issue of endogeneity and measurement errors. The paper also appraised the results from FE and RE using Hausman test, which indicates that the estimates from RE were more efficient than those of FE.

Furthermore, the system GMM, which helps to address endogeneity and measurement challenges are reported. To evaluate whether models were correctly specified and whether instruments were valid, The Hansen/Sargan *J* statistics and the test for first and second order serial correlation of the residual in differenced equation were carried out [*AR(1)* and *AR(2)*]. If the model is correctly specified, the variables in the instrument set should be uncorrelated with the idiosyncratic component of the error term.

**Table 4a Estimated Results with Real GDP per Capita**

Estimators⇒ /Variables ↓	Dependent Variable ⇒ <i>Lnrpgdp</i>									
	OLS	FE	RE	GMM (Syst)	GMM (Syst)	OLS	FE	RE	GMM (Syst)	GMM (Syst)
<i>Lnrpgdp(-1)</i>				0.6475 <sup>a</sup> (0.000)	0.6587 <sup>a</sup> (0.000)				0.5208 <sup>a</sup> (0.000)	0.5403 <sup>a</sup> (0.000)
<i>Trdgrot</i>	0.0090 <sup>a</sup> (0.001)	0.0019 <sup>b</sup> (0.033)	0.0031 <sup>a</sup> (0.004)	0.0015 <sup>a</sup> (0.000)	0.0014 <sup>a</sup> (0.000)					
<i>Lnrtrdint</i>	0.1825 (0.103)	0.0666 (0.167)	0.0134 (0.235)	0.0126 (0.477)	0.0139 (0.474)					
<i>Lnapt</i>	0.0423 (0.423)	-0.0448 (0.180)	-0.0617 (0.240)	-0.0114 (0.580)	-0.0123 (0.589)	0.1101 (0.054)	-0.0357 (0.170)	-0.0432 (0.142)	-0.0035 (0.864)	-0.0306 (0.195)
<i>Lninvest</i>	0.6654 <sup>a</sup> (0.000)	0.1378 <sup>a</sup> (0.000)	0.3404 <sup>a</sup> (0.000)	0.0642 <sup>a</sup> (0.000)	0.0664 <sup>a</sup> (0.000)	0.6507 <sup>a</sup> (0.000)	0.1563 <sup>a</sup> (0.000)	0.3184 <sup>a</sup> (0.000)	0.0886 <sup>a</sup> (0.000)	0.0914 <sup>a</sup> (0.000)
<i>Lnlab</i>	0.7036 <sup>a</sup> (0.000)	0.4446 <sup>a</sup> (0.000)	0.4554 <sup>a</sup> (0.000)	0.1380 <sup>c</sup> (0.072)	0.1060 <sup>c</sup> (0.054)	0.6660 <sup>a</sup> (0.000)	0.3026 <sup>c</sup> (0.060)	0.4418 <sup>c</sup> (0.000)	0.1377 <sup>c</sup> (0.073)	0.1465 <sup>b</sup> (0.046)
<i>Lnexpint</i>						-0.0011 (0.983)	0.0197 (0.582)	0.1095 (0.202)	0.0137 (0.414)	0.0002 (0.489)
<i>Constant</i>	4.0223 <sup>a</sup> (0.000)	2.6174 <sup>a</sup> (0.000)	6.4644 <sup>a</sup> (0.000)	3.0932 <sup>b</sup> (0.014)	2.5447 (0.162)	2.7717 <sup>a</sup> (0.000)	1.2076 (0.525)	6.3720 <sup>a</sup> (0.000)	3.4012 <sup>a</sup> (0.006)	3.4734 (0.136)
<i>Adj. R<sup>2</sup>/(R<sup>2</sup>)</i>	0.8633	0.5234 38.00 <sup>a</sup> (0.000)	0.4459			0.8421	0.4916 42.300 (0.000)	0.4399		
<i>F-stat</i>			72.39 <sup>a</sup> (0.000)	85.25 <sup>a</sup> (0.000)	96.74 <sup>a</sup> (0.000)			48.44 <sup>a</sup> (0.000)	73.30 <sup>a</sup> (0.000)	47.71 <sup>a</sup> (0.000)
<i>Hausman test</i>			13.22 <sup>a</sup> (0.000)					19.86 <sup>a</sup> (0.000)		
<i>Hansen J</i>									0.5722	0.4807
<i>AR(1)</i>									0.001	0.002
<i>AR(2)</i>									0.367	0.4212
<i>Time effect</i>				No	Yes				No	Yes

**Note:** OLS - Ordinary Least Squares; FE- Fixed Effects; RE- Random Effects; GMM- Generalised Method of Moments. R<sup>2</sup> for OLS is adjusted but for FE and RE it is the overall. The probability values are in parenthesis. Superscripts <sup>a</sup>, <sup>b</sup> and <sup>c</sup> denote significant at 1, 5 and 10 per cent, respectively.

**Source:** Authors' computation.

More so, for the instruments to be valid, the probability values for Sargan test and the *AR(2)* tests should both be greater than 0.05. The *AR(1)* test is asymptotically distributed as a standard normal under the null of no first-order serial correlation. The GMM estimator requires that there is first-order serial correlation, *AR(1)* but no second-order serial correlation, *AR(2)* in the residuals (Arellano and Bond 1991; Leyaro and Morrissey 2010). The tests statistics show that the estimates are reliable. Hence, this paper focus discussions on RE and GMM estimates.

In Table 4a, using real per capita GDP as indicator of economic development, the results show that the key determinants of economic development in the selected African countries within the studied period include: past level of economic development, real growth in trade, domestic investment and labour force. This is given based on the fact their coefficients were significant at the usual levels. Surprisingly, trade and export integration ratios were found not to be significant in influencing economic development, though they had the expected positive association with export integration (*expint*) being a little greater than trade integration (*trdint*). In a similar fashion, average tariff had negative sign; however it was not significant at 10 per cent.

**Table 4b Estimated Results with HDI**

Estimators⇒ /Variables ↓	Dependent Variable ⇒ <i>Lnhd</i>									
	OLS	FE	RE	GMM (Syst)	GMM (Syst)	OLS	FE	RE	GMM (Syst)	GMM (Syst)
<i>Lnhd(-1)</i>				0.0167 (0.886)	0.0898 (0.462)				0.0497 (0.662)	0.0659 (0.580)
<i>Trdgrot</i>	0.0031 <sup>a</sup> (0.002)	0.0005 <sup>d</sup> (0.030)	0.0010 <sup>d</sup> (0.043)	0.0002 <sup>a</sup> (0.007)	0.0001 <sup>c</sup> (0.074)					
<i>Lntrdint</i>	0.0490 (0.135)	0.0414 (0.130)	0.0744 (0.210)	0.0373 (0.282)	0.0469 (0.197)					
<i>Lnapt</i>	-0.0095 (0.647)	-0.0027 (0.837)	-0.0101 (0.451)	0.0116 (0.724)	0.0186 (0.637)	-0.0033 (0.759)	-0.0072 (0.293)	-0.0100 (0.143)	0.0283 (0.373)	0.0309 (0.407)
<i>Lninvest</i>	0.1660 <sup>a</sup> (0.000)	0.0652 <sup>a</sup> (0.000)	0.1334 <sup>a</sup> (0.000)	0.0544 <sup>b</sup> (0.015)	0.0368 <sup>b</sup> (0.014)	0.0861 <sup>a</sup> (0.000)	0.0329 <sup>a</sup> (0.000)	0.0636 <sup>a</sup> (0.000)	0.0719 <sup>a</sup> (0.003)	0.0550 <sup>b</sup> (0.040)
<i>Lnlab</i>	0.1304 <sup>a</sup> (0.000)	0.2896 <sup>a</sup> (0.000)	0.1034 <sup>a</sup> (0.000)	0.5246 <sup>a</sup> (0.000)	0.6260 <sup>b</sup> (0.017)	0.0726 <sup>a</sup> (0.000)	0.1283 <sup>b</sup> (0.030)	0.0506 <sup>a</sup> (0.000)	0.4575 <sup>a</sup> (0.000)	0.5541 <sup>b</sup> (0.017)
<i>Lnexpint</i>						0.0103 (0.286)	0.0355 (0.120)	0.0465 (0.201)	0.0585 (0.160)	0.0568 (0.191)
<i>Constant</i>	-2.3740 <sup>a</sup> (0.000)	-6.6354 <sup>a</sup> (0.000)	-2.2162 (0.000)	-1.0074 <sup>a</sup> (0.000)	-1.1101 <sup>a</sup> (0.070)	-0.2222 <sup>a</sup> (0.000)	2.2291 <sup>a</sup> (0.000)	-0.1869 (0.120)	1.4619 <sup>a</sup> (0.000)	1.4488 <sup>c</sup> (0.091)
<i>Adj. R<sup>2</sup>/(R<sup>2</sup>)</i>	0.7672	0.5660	0.5005			0.7626	0.5735	0.5256		
<i>P. Value</i>	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>F-stat</i>		42.00 (0.000)					54.4500			
<i>Wald-stat.</i>			85.74 (0.000)	87.18 (0.000)	90.70 (0.000)			96.04 (0.000)	91.36 (0.000)	96.84 (0.000)
<i>Hausman Test</i>			26.14 (0.001)					40.98 (0.000)		
<i>Hansen J</i>									0.6071	0.5787
<i>AR(1)</i>									0.000	0.001
<i>AR(2)</i>									0.3976	0.4851
<i>Time effect</i>				No	Yes				No	Yes

**Note and Source:** Same in Table 4a

Table 4b reports the result using the second indicator of economic development (human development index). The results appear somehow similar to the previous one as the major determinants were observed to be domestic investment, labour force and real trade growth. However, previous level of HDI was positive but not significant. Both trade and export integration ratios were not significant but real trade growth was significant. The interpretation for this may mean that in the long-run, real rate of Africa's growth in trade has the possibility of impacting on economic development unlike mere trade integration. This implies that unguided openness to trade does not lead to economic development as it has been noted that the argument for protection of infant industry in Africa is far from been over. This is in line with the submission made by Ackah and Morrissey (2010).

The major policy recommendation emanating from the results and findings in this paper is that tariff reduction argument does not favour African countries, while trade integration may be good but it is not significantly sufficient in influencing economic development. Another implication for policy is that efforts to promote the level of domestic investment and labour productivity are very germane for economic development in Africa. Such policies should encompass enhancement of internal mechanism including vibrant financial institutions, political stability, functional telecommunication and transport facilities, *inter alia*. This is because the above efforts will help boost the level of capacity utilisation as well as capital formation, which are essential for economic development.

## **6 Conclusion**

The debate on economic development, trade and tariff is not yet over especially in Africa with varying opinions in literature. This motivated the present paper, which examined the nexus between economic development, trade and tariff for the period 1995 to 2008. To achieve the objective of the study, data sourced from human development reports, world development indicators, and world trade indicators were analysed using both descriptive and econometric techniques.

The results obtained from the empirical analyses established that regions in Africa that had higher level of domestic investment experienced higher indicators of economic

development. The paper equally found that domestic investment and labour played more significant contribution to economic development in Africa than both trade and tariff. The challenge in this regards is the fact that increased trade integration in Africa do not significantly lead to enhancement of the economic development process. Thus, improving domestic investment and enhancing labour productivity will promote economic development more than trade and tariff. Hence, the paper cautioned against swift trade integration and unguided tariff reduction since they did not exert much impact on economic development over the period studied.

The implication of the above findings is that there is a somewhat challenge of Africa's trade integration measures though having the potentials, which do not significantly result in enhancement of economic development in the continent. Another implication from the result is that domestic investment, labour, real growth in trade are important factors for Africa's economic development. Thus, the choice before African countries is to enhance domestic investment and harnessing of their labour force in order to improve their level of economic development. This policy recommendation can be engendered through promotion of functional and technical education, which will help to adequately develop and utilise the abundant labour force in most African economies. Another measure will be the pursuance of vibrant and resilient financial sector that will be focused to play active role for meaningful domestic resource mobilization, which is fundamental in stimulating domestic capital.

The submission of the paper is crucial given the event of global financial crisis where commodities prices and global demand of primary products, which are traded by most African countries, have *nose-dived*. Thus, reliance of domestic investment and labour force, which are not so subject to external shocks, will be a better policy choice more than clamour for mere trade integration and tariff reduction.

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## REFERENCES

Ackah, C. and Morrissey, O., 2010, 'Who Gains from Trade Liberalization in Developing Countries? Evidence from Macro-Micro Analysis', *paper presented at International Workshop on the Determinants and Effects of Trade and Foreign Direct Investment in SSA*, Accra, Ghana, 26-28 October.

African Development Bank, 2008, *Selected Statistics on African Countries*, Vol. XXVII, Tunis: African Development Bank.

Agama, L. A., 2001, 'Assessing the Desirability of a Free-Trade Area in Southern Africa', *International Economic Review*, July/August: 1-6.

Arellano, M. and Bond, S. R., 1991, 'Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations', *Review of Economic Studies*, Vol.58, No.2, pp.277-297.

Aw, B.Y., Chung, S. and Roberts, M.J., 1999, 'Productivity and Turnover in the Export Market: Micro Evidence from Taiwan and South Korea', *NBER*, February.

Baum, C.F., 2006, *An Introduction to Modern Econometrics Using Stata*, Texas: Stata Press.

Berg, A. and Krueger, A., 2003, 'Trade, Growth, and Poverty', *IMF Working Paper*, WP/03/30.

Bhagwati, J., 1988, 'Export-Promotion Trade Strategy: Issues and Evidence', *The World Bank Research Observer*, Vol.1, pp.27-57.

Bhagwati, J. N. ,2004, *In Defense of Globalisation*, New York: Oxford University Press.

Clarke, R. and Kirkpatrick, C., 1992, 'Trade Policy Reform and Economic Performance in Developing Countries: Assessing the Empirical Evidence', in R. Adhikari, C. K Kirkpartick

and J. Weiss,eds., *Industrial and Trade Policy Reform in Developing Countries*, Manchester: Manchester University Press.

David, M. and Schott, A., 2005, *Macroeconomics: Understanding the Wealth of Nations, A Handbook*, New York: John Welly & Sons.

Dollar, D., 1992, 'Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-1985', *Economic Development and Cultural Change*, Vol.40, No.3, pp.523-544.

Dixit, A. and Norman, V., 1980, *Theory of International Trade*, Cambridge: University Press.

Edwards, S., 1997, 'Openness, Productivity and Growth: What Do We Really Know?', *NBER Working Papers*, No. 5978.

Ferriera, P. C. and Rossi, L., 2001, 'New Evidence on Trade Liberalisation and Productivity Growth', *Ensaaios Economicos da*, EPGE 433.

Grossman, G. M. and Helpman, E., 1991, *Innovation and Growth in the Global Economy*, Cambridge: MIT Press.

Grossman, G.M. and Helpman, E., 1995, 'Trade Wars and Trade Talks', *Journal of Political Economy*, Vol.103, pp.675-708.

Human Development Reports, Various Issues, New York: United Nations Development Programme.

Jonsson, G. and Subramanian, A., 2001, 'Dynamic Gains from Trade: Evidence from South Africa', *IMF Staff Papers*, Vol.48, No.1, pp.187-224.



Khalifa Al-Youssif, Y., 1997, 'Exports and Growth: Some Empirical Evidence from the Arab Gulf States', *Applied Economics*, Vol. 29, pp.693-697.

Kraay, A., 1997, 'Exports and Economic Performance: Evidence from a Panel of Chinese Enterprises', *Mimeo*, Washington DC: The World Bank.

Krugman, P., 1983, 'New Theories of Trade among Industrial Countries', *American Economic Review*, Vol.73, No.2, pp.343-347.

Levine, R and Renelt, D., 1992, 'A Sensitivity Analysis of Cross-Country Growth Regressions', *American Economic Review*, Vol.82, No.4, pp.942-963.

Leyaro, V. and Morrissey, O., 2010, 'Trade and Growth: Is Sub-Saharan Africa Different?', *CREDIT Research Paper*, No.10/04.

Nash, J., 1993, 'Trade Policy Reform Implementation in Sub-Saharan Africa: How Much Heat and How Much Light?', *Mimeograph*, Washington DC :The World Bank.

Ngoc, P.M., Phuong Anh, N. T. and Nga, P.T., 2003, 'Exports and Long-Run Growth in Vietnam, 1976-2001', *ASEAN Economic Bulletin*, Vol. 20, pp.1-25.

Olokoyo, F.O., Osabuohien, E.S. and Salami, A.O., 2009, 'An Econometric Analysis of Foreign Reserves and Some Macroeconomic Variables in Nigeria (1970-2007)', *African Development Review*, Vol.20, Issue 3, pp.454-475.

Sachs, J. D. and Warner, A M., 1995, 'Economic Convergence and Economic Policies', *Brookings Papers in Economic Activity*, Vol.1, pp.1-95.

Solow, R. M., 1956, 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics*, Vol.70, pp.65-94.

Srinivasan, T.N., 2000, 'Developing Countries in the World Trading System: from GATT, 1947, to the Third Ministerial Meeting of WTO, 1999', *The World Economy*, Vol.23, pp.437-454.

Stiglitz, J. E., 2002, *Globalisation and its Discontents*, New York: Norton and Company.

Taylor, A.M., 1998, 'On the Costs of Inward-Looking Development: Price Distortions, Growth and Divergence in Latin America', *The Journal of Economic History*, Vol.58, No.1, pp.1-28.

Tilat, A., 2002, 'Impact of Globalisation and Liberalisation on Growth, Employment and Poverty: A Case Study of Pakistan', *UNU-WIDER Research Paper*.

Winters, L. A., 2004, 'Trade Liberalisation and Economic Performance: An Overview', *Economic Journal*, Vol.114, No.2, pp.F4-21.

Winters, L. and Mackay, A., 2004, 'Trade liberalisation and Poverty: The Evidence So Far', *Journal of Economic Literature*, Vol.42, No.1, pp.72-115.

World Bank Group, 2010, *World Trade Indicators 2009/10*. (<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,contentMDK:22421950~pagePK:148956~piPK:216618~theSitePK:239071,00.htm>). 12 February 2010).

## Appendix

**Table A1 List of Countries used in the estimation**

Central	East	North	Southern	West
Burundi	Comoros	Algeria	Angola	Benin
Cameroon	Djibouti	Egypt	Botswana	Burkina Faso
Central Africa Rep.	Eritrea	Libya	Lesotho	Cape Verde
Chad	Ethiopia	Morocco	Mozambique	Cote d'Ivoire
Congo,DR	Kenya	Tunisia	Namibia	Gambia
Congo, Republic	Madagascar		South Africa	Ghana
Equatorial Guinea	Malawi		Swaziland	Guinea
Gabon	Mauritius		Zambia	Guinea Bissau
Rwanda	Seychelles		Zimbabwe	Mali
	Sudan			Mauritania
	Tanzania			Niger
	Uganda			Nigeria
				Senegal
				Sierra Leone
				Togo

Source: WTO (2009) *International Trade Indicators*