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RELATIONSHIP BETWEEN TRADE LIBERALIZATION AND ECONOMIC GROWTH:  
EMPIRICAL EVIDENCE FROM SUB-SAHARAN AFRICA

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ABSTRACT

This study empirically examines the relationship between trade liberalization and economic growth in Sub-Saharan Africa using a panel data for the period of 1970-2010. Data was obtained from World Development Indicators and we adopted the OLS approach. Our results indicate that trade liberalization and FDI have significant positive impact on the economic growth of Sub-Saharan Africa. On the other hand, financial development and inflation have a significant negative influence on economic growth, while population growth has an insignificant relationship with economic growth. This study therefore, concludes that Sub-Saharan Africa can vigorously pursue trade liberalization policies in order to enhance their economic growth. We recommend that since trade could serve as engine of growth to Sub-Saharan Africa, countries should trade especially among themselves for mutual benefits.

*Keywords:* Trade Liberalization, Economic Growth, Empirical Evidence, Africa

1. INTRODUCTION

Trade policy reforms and especially trade liberalization has been a regular feature of African economies since the mid-1980's. The general belief was that trade reforms, especially when combined with exchange rate reforms and better domestic macroeconomic policies could enhance trade-induced economic expansion and consequently reverse the downward trend of African economies (Ekpo,2005). Prior to this time, particularly between the early 1960's and the early 1980's, many African countries operated highly interventionist and **protectionist trade regimes** on both import and export sides. On the import side, trade regime is characterized by restrictive import licensing systems, and tight foreign exchange controls. **From the export side,** substantial implicit and explicit taxes, as well as the prohibition of certain export items and **other non-tariff barriers were common features of the trade regimes.**

**Trade liberalization policy** is one of the policies adopted by the developing countries in the late 1980's following the World Development Report (1987) which argues that "outward oriented countries performed better than inward oriented countries" even under unfavourable market conditions, as a solution to their economic crisis. The policy **is also part of contemporary**

globalization policies pursued by both the developed and developing countries to promote world economic integration.

Trade liberalisation is one of the major conditions adopted by the international lending agencies such as World Bank and International Monetary Fund (IMF) for granting aids and other kinds of external economic assistance to developing African countries (Onafowora and Owoye, 1997). In the post second world war period, many less developed countries (LDC's) follow the path of Import Substituting Industrialization (ISI), they were predominantly agricultural and exporters of primary commodities. Since then majority of these countries including Sub-Saharan African countries opened up their economies through various trade liberalization policies such as, reduction in tariffs and elimination of trade barriers.

## 2. LITERATURE REVIEW

A number of empirical works have been conducted on the relationship between trade liberalization and economic growth in both developed and developing countries. Daniel, *et al.* (2006) examines the relationship between trade openness and economic growth for a panel Data set of 18 Latin American countries for the period of 1952-2003. The analysis involves three variables: the annual growth rate of GDP per capita, the openness index (exports plus imports divided by GDP) and the investment share of the GDP. The data was obtained from the Penn World Table version 6.2. They applied the Granger non-causality test, using a panel data approach based on SUR (seemingly unrelated regression) systems. The results indicate that, in seven countries (Brazil, Chile, Ecuador, Guatemala, Panama, Paraguay, Uruguay) there is unidirectional Granger causality running from trade to growth, in three countries (Argentina, Dominican Republic and El Salvador) the causality goes from growth to trade, in two countries (Costa Rica and Mexico) there is bidirectional Granger causality between these variables, in six countries (Bolivia, Colombia, Honduras, Nicaragua, Peru and Venezuela) there is no evidence of Granger causality in either direction.

Sultan, (2008) used the econometrical methodologies to examine the relationship between international trade and economic growth in Bangladesh. Annual data from 1965-2004 are used for this study. The data are in constant local currency units for Bangladesh. Data are collected from world development indicators of the World Bank and from the international financial statistics of the international monetary fund (IMF). Granger causality tests are performed within the VAR framework. The multivariate Granger causality test for the variables shows that the variable GDP is Granger caused by import, export, and investment as the p-value is significant at 5% level. Export orientation and industrialization (industrial value added) would accelerate the demand for imports of capital goods and technology, which in turn will increase the economic growth of Bangladesh.

Mohammed, *et al.* (2010) conducted a research in Pakistan to examine the causality relationship between FDI, international trade and economic growth, using quarterly time series data from 1998-2009. The basic principle of Granger causality Analysis and Vector Auto Regression models were used. Most of the data on variables used in the tests are taken and calculated from Pakistan's Statistical Year book of General Statistics Office, Pakistan. As shown, there is bidirectional causality between GDP and EXPORT; there is unidirectional relationship between GDP and IMPORT. However, there are only unidirectional causal connection running from IMPORT to FDI and GDP. The results are consistent with growth theories that export promotion and attracting FDI can generate permanent effects on the level of GDP. Openness of a country is the important factor attracting FDI inflows.

Imran, *et al.* (2010) investigate empirically the causality relationship between trade liberalization, human capital and economic growth in Pakistan by employing co-integration and Granger causality techniques of time series econometrics for the period of 1972-2007. The data

on trade liberalization and economic growth are taken from the world development indicators, ESDS international website while human capital index is constructed based on the data from Pakistan economic survey. The variables Gross Domestic Product (LRGDP), Employed Labour Force (LLABOUR), gross fixed capital formation as percent of GDP. Proxy for capital (LCAPITAL), real exports as percent of GDP (LEXPOR) and human capital index (LHCAPT) are selected. The empirical results reveal that there exist short run and long run co-integration and causality relationships among variables in the growth model. It implies that education and trade openness policies may be feasible with sustained economic growth. It is also found that causality runs from trade liberalization and human capital to economic growth. More specifically a 1% increase in trade openness leads to 3.06% rise in the real gross domestic product and stands more elastic. The results are also consistent with the growth theories and economics literature.

Olugbenga, and Oluwole, (1998) examines changes in economic growth that are likely to result from changes in trade policies, exports and investment in 12 sub Saharan African countries SSA (Burundi, Cameroon, Cote d'voire, Ethiopia, Ghana, Kenya, Madagascar, Nigeria, Senegal, Sudan, Tanzania, Zambia). Using a Vector Error Correction Model (VECM). The results indicate that trade policies, exports, and investment rate shocks have a significant impact on economic growth in 10 of the 12 SSA countries except Cameroon and Sudan. This suggests that it is possible to stimulate economic growth in some African countries through an outward looking strategy. More significantly, the results further suggest the importance as well as the need for African countries to embark on trade liberalization policies in order to enhance economic growth in current world economy.

Olusegun, *et al.* (2009) examines the empirical econometric evidence of both causal and long run interrelationships among FDI, trade openness and economic growth in Nigeria. This study employs Nigerian time series from 1970-2006, the variables employed are source from world development indicators (WDI,2007) and Central Bank of Nigeria statistical Bulletin (2006) the study employs more robust econometric procedures by employing the Toda-Yamamoto non-causality test and the Auto Regressive Distributed Lag (ARDL) technique to cointegration. The test reveals unidirectional causality running from trade openness to output, having established a long run relationship among variables when their vector is normalized on output, the ARDL Cointegration procedure further suggests, however that both FDI and trade openness are positively related to and significant in explaining output growth in Nigeria. The study recommends more trade openness and in flow of FDI for output growth dynamics in Nigeria.

Yohong, *et al.* (2010) conducted an empirical Analysis based on panel causality on the relationship between foreign trade and GDP Growth in West China. The study adopt modern testing methods like unit root test, panel cointegration analysis and error correcting model for searching the causalities between foreign trade including total export and import with the panel data of 12 provinces, cities, and districts of west China from 1985-2008. the result indicates that there exist long term causality between GDP and all the three indexes, reform and opening up has greatly improved the development of foreign trade and economy of west china GDP increase from 58,023 million dollars in 1985 to 849,651 million dollars in 2008 and the value of import and export increased from 199,879.60 thousand dollars in 1985 to 106,475,430 million dollars in 2008.

In a study conducted by Prabirjit, (2005) on whether or not trade liberalization stimulated economic growth in India and Korea since the 1950s using data obtained from IFS over the period 1956-1999 for India and 1956-2001 for Korea. Applying ARDL approach to cointegration finds no positive long-term relationship between trade openness and economic growth in India and Korea during the period under study.

In another study conducted by Prabirjit, (2007) examines the relationship between trade openness and economic growth using a cross-country panel data analysis of a sample of 51 less developed countries collected from WDI of World Bank over the period 1981-2002. The results of the study shows a positive relationship between trade openness and economic growth, which suggests that a country with a higher trade share, tends to experience a higher real growth. A similar study by Barboza (2007) study the contribution of trade openness on output growth in Latin America using panel data over the period 1950-2000 sourced from the Penn World Tables and World Bank Economic Indicators. The results finally indicate a positive and strong relationship between trade openness and economic growth.

Parikh, and Stirbu, (2004) examine the impact of trade liberalization on economic growth for 42 developing countries of Asia, Africa, and Latin America. Both panel data and country by country data are used to measure the impact of trade liberalization on domestic economic growth using data collected from international financial statistics (IFS) for the period 1990-99. For three regions, fixed effect and random effect models are conducted and in country by country analysis, OLS regression is also conducted. These relationships suggest that liberalization promotes growth but the growth has a negative effect on trade balance for a large majority of countries. The country by country regression indicates that the liberalization contributes positively to growth in African economies.

### 3. METHODOLOGY

This study used secondary data covering the period from 1970 to 2010. Data was sourced from World Development Indicators (WDI) and International Financial Statistics (IFS). The data comprise of Real Gross Domestic Product (RGDP), Trade Openness index measured by the average share of trade in GDP i.e. Export plus Import/GDP, Foreign Direct Investment, Population Growth, Inflation, Financial Development. In this study, a simple random sampling technique will be used to select our sampled countries from the region.

Two dependent variables will be used for this study because of the expected bi-directional relationship between trade and growth. In line with the studies of Yuhong, L. *et al.* (2009), Lawrence, M. (2006), and Ron, D. and Deon, Q. (2004), real GDP will be used as a proxy for economic growth in the model. Trade liberalization is measured by foreign trade share index. The foreign trade share is the sum of imports and exports (goods and services) weighted by the factor of  $\frac{1}{2}$  relative to GDP, due to availability of data. GDP per capita is regressed on proxy for trade liberalization and other control independent variables. In trying to introduce a number of control variables into the model specified in this study, a number of other determinants of economic growth have been identified. This is in line with a number of studies such as in Yuhong, *et al* (2010) and, Dan and Micheal (1998). The variables are measured as follows:

- *Population*: In the study of Ahmed, and Huseyn, (2007) population is another determinant of economic growth. This is measured by the total population of a country per year.
- *Foreign Direct Investment*: This variable is measured using cumulative foreign private investment (Olusegun, O. et. al., 2009).
- *Inflation*: This variable is measured by the inflation rate of the country(see: Chimobi, 2010)
- *Financial Development*: This variable is measured by the total credit to private sector by banks (Jalil, 2008).

### 3.1 MODEL SPECIFICATION

In order to investigate the relationship between trade liberalization and economic growth in Sub-Saharan Africa, a very notable and related model to this present study is that of Onafowora and Owoye (1997). In trying to examine the relationship between trade liberalization and economic growth, the authors regressed real GDP as a proxy for economic growth on a host of trade liberalization and other control variables. Adopting this pattern, the present study specifies the following model.

$$GDP_{it} = \phi_0 + \phi_1 TR_{it} + \phi_2 POPGWRT_{it} + \phi_3 INFL_{it} + \phi_4 FINDEV_{it} + \phi_5 FDI_{it} + U_t \dots\dots\dots(1)$$

Where:

$GDP_{it}$  = the dependent variable (real GDP)

$\phi_0$  = intercept or constant parameter

$TR_{it}$  = trade liberalization

$POPGWRT_{it}$  = population growth

$INFL_{it}$  = inflation

$FINDEV_{it}$  = financial development

$FDI_{it}$  = foreign direct investment

$\mu_t$  = error term

### 3.2 DATA ANALYSIS

The panel data set will be analysed using STATA econometric software. To avoid any form of misspecification an adequate panel analytical model has to be used. According to Yaffee, (2005) the Ordinary Least Square (OLS), fixed effects and random effects models are commonly used to analyse panel data. In trying to adopt the most suitable of all models for panel data, the Hausman specification test has been used to determine which of these models is suitable. In essence the STATA econometrics package has been used to run the test.

## 4. RESULTS AND DISCUSSIONS

It could be discerned from Table 1 that Real Gross Domestic Product (RGDP) has minimum \$50.25 million; the maximum value of the variable is \$135.22 million with mean value of \$3.20 and the standard deviation of 6.12. From the Table, it is clear that minimum value of Foreign Direct Investment (FDI) is \$1.76 million. The maximum value of the variable is \$22.36 million. The mean value of FDI is 1.42 with 0.78 as standard deviation. The minimum value of population of the panel of sample is 378672 while the maximum number of the population is 158000000. Furthermore, the variable has the minimum value of 3.17 and the standard deviation of population is 3.13. It can also be observed from the Table that financial development has the minimum value of 4.871 with the maximum value of 195.34. The mean value of financial development is 35.08 while the standard deviation of the variable is 38.08. The minimum value of inflation is 4.14 with 23773.13 as the maximum value. The mean value of inflation is 123.13 and the standard deviation of the variable is 1348.29.

Levin-Lin-Chu test (LLC) (2002) and Harris-Tzavalist test (HT) (1999) assumes that all panel have the same autoregressive parameter. They further require that the panels be strongly balanced. The major limitation of the LLC, HT and Breiting panel units root test is the assumption that all panels have the same value of error term. The Im-Pesaran-Shin (IPS) (2003) test relaxes the assumption of a common error term and instead allows each panel to have its own error term. IPS test does not require strongly balanced data, but there can be no gaps in

each individual time series. The result of Im-Pesaran-Shin (2003) panel unit root is presented in following Table 2.

Table 1: Descriptive Results

Variables	Min	Max	Mean	Std dev.
RGDP	50.25	135.22	3.20	6.12
Trdlib	6.87	45.78	12.21	10.11
FDI	1.76	22.36	1.42	0.78
Population	378672	158000000	3.17	3.1300
Findev	4.871	195.34	35.08	38.08
Inflation	4.141	23773.13	1348.29	1348.29
No. of panels	8			
Average No. of periods	40			

Source: Data analysis, 2012

Table 2: Im-Pesaran-Shin Unit Root Test

Variable	Statistics			p-value
	t-bar	t-tilde-bar	z-t tilde-bar	
RGDP	-5.42 <sup>***</sup>	-4.04 <sup>***</sup>	-9.09 <sup>***</sup>	0.0000
Trdlib	-7.42 <sup>***</sup>	-4.71 <sup>***</sup>	-11.51 <sup>***</sup>	0.0000
FDI	-3.69 <sup>**</sup>	-2.98 <sup>**</sup>	-5.36 <sup>***</sup>	0.0000
Population	1.45	-3.04 <sup>**</sup>	5.02 <sup>***</sup>	0.0300
Findev	-8.10 <sup>***</sup>	-4.66 <sup>***</sup>	-11.31 <sup>***</sup>	0.0000
Inflation	-3.73 <sup>**</sup>	-3.16 <sup>**</sup>	-5.10 <sup>***</sup>	0.0000

\*\*\* & \*\* indicate significance at 1% and 5% level of significance

The result of panel unit root test is presented in the Table 2 above. From the Table it is evident that the value of RGDP is stationary at 1% level of significance using both t-bar, t-tilde-bar and z-t tilde-bar. Similarly the coefficient of trade liberalisation has no unit root because the variable is significant at 1% probability level. Moreover, the parameter of FDI is however significant at 1% on z-t tilde-bar and 5% significant on both t-bar and t-tilde-bar. On the other hand, the variable population has unit root as indicated by t-bar and z-t tilde-bar while the variable is significant at 5% t-tilde-bar. Furthermore, the coefficient of financial development is stationary at even 1% level of significant while the coefficient of inflation is significant at 5% probability level and so the variable is free from unit root problem.

Table 3: Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1183.588	NA	5.12E+30	84.89915	85.13704	84.97188
1	-1078.792	164.6789	1.77E+28	79.19946	80.62682	79.63582
2	-1030.246	58.94885	3.98E+27	77.51759	80.13443	78.31759
3	-978.8916	44.01832*	1.06E+27	75.63512	79.44141	76.79874
4	-916.4176	31.23699	3.10E+26*	72.95840*	77.95417*	74.48566*

Lag order is selected to pave way for having minimum statistics. Table 3 shows the result of likelihood ratio sequential modified test, final prediction error, Akaike information criterion, Schwarz information criterion and Hannan-Quinn information criterion. It could from the above Table that LR test indicated 3 lag order while the remaining criterions indicated 4 lag orders and so 4 lag order will be used in order to minimise the statistics.

The result of fixed and random effect is presented in Table 4 above. It could be observed from the Table that the coefficient of trade liberalisation is 0.258 and 0.256 using random and fixed effect respectively. The variable appears to be significant at 10% level of significance. The positive sign of the parameter indicates a significant positive relationship

between Real Gross Domestic Product (RGDP) and trade liberalisation in Sub-Saharan Africa (SSA). Therefore, the hypothesis which suggests that there is no significant relationship between trade liberalisation and RGDP is not accepted.

Table 4: Fixed And Random Effects Results

Variables	Coefficient	
	Fixed effect	Random effect
FDI	0.256 (1.76)*	0.258 (1.84)*
Population	-0.001 (-0.74)	-0.008 (-0.48)
Findev	-0.035 (-2.05)**	0.022 (-1.72)*
Inflation	-0.61 (-0.18)	-0.003 (-1.48)
Trdlib	0.052 (1.82)	0.040 (1.63)*
LR Chi <sup>2</sup>	4.19***	17.56***

\*\*\*, \*\* & \* indicate significant at 1%, 5% and 10% levels respectively

On the other hand, the coefficient of population is negative and the variable appears to be insignificant even at 10% percent probability level. Therefore the hypothesis which proposes no significant relationship between population level and the RGDP is not rejected. This means that there is insignificant negative relationship between population growth and RGDP in Sub-Saharan Africa. Similarly, the estimated value of financial sector development is -0.003 and -0.035 on Fixed and Random effects column respectively with the z-value of -1.72 and -2.05. This indicates a significant negative relationship between financial sector development and economic growth in Sub-Saharan Africa. As such the hypothesis which assumed no significant relationship between financial sector development and economic growth is not accepted.

Moreover, the coefficient of FDI is 0.258 and 0.256 in random and fixed effect column respectively. The variable appears to be significant at 10% level of significant. Therefore, the hypothesis which proposes no significant relationship between FDI and economic growth is not accepted in case of Sub-Saharan Africa. As such there is significant positive relationship between FDI and economic growth. On the other hand, the estimated coefficient of inflation is negative and significant at 10% level of significant using random effect but statistically insignificant using fixed effect. Therefore, the hypothesis which suggests no significant relationship between inflation and economic growth is not accepted.

The Log-likelihood Ratio (LR) reported in the above Table appears to be significant at 1% level of significant. This indicates that both models are adequate and the equation has a good fit. Further, the results of Hausman specification test reveals that there is no significant difference between the estimated results of both models and thus the two models produce the robust results. We further use LM test to decide between a random effect regression and a simple OLS regression. The null hypothesis is that variables across entities are zero. The result shows that random effect is appropriate. As such there is evidence of significant differences across countries; therefore, it cannot be analysed using a simple OLS regression.

This study investigated the relationship between trade liberalisation and economic for SSA and the study found a significant positive relationship between trade liberalisation and economic growth. This finding means that trade liberalisation boost economic growth of SSA. This finding is consistent with findings of Olugbenga and Oluwale (1998), Olusegun *et al*, (2009) and those Yohong *et al*, (2010). However, the finding refuted the finding of Prabirjit

(2005) which found no significant relationship between trade liberalisation and economic growth for India and Korea.

Moreover, the study examines the effect of foreign direct investment on economic growth for SSA. The study reveals a significant positive relationship between foreign direct investment and economic growth. This finding indicates that foreign direct investment will serve as a engine of growth for SSA. This finding supported the findings of Agrawal (2000) and that of Anyanwale (2007) while the finding contradicts the finding of Katerine *et al*, (2004) which documented insignificant relationship between foreign direct investment and economic growth.

Further, this study documents a significant negative relationship between financial sector developments on economic growth in SSA. This finding shows that financial sector is not promoting economic growth in SSA. The financial intermediaries in SSA are very weak as such the offers very little to the growth of such economies. This finding disputed the finding of Jalil (2008) which reported a significant positive relationship between financial sector development and economic growth for China.

Similarly, this study investigates the impact of inflation and economic growth and found that there is a significant negative relationship between inflation and economic growth for SSA. This finding supported the finding of Chimobi (2010) which reveals that there is no significant relationship between inflation and economic growth in long run. However he reported a significant positive relationship between two variables in question. There are controversies among economist over the effect of population growth on economic growth. The finding of this study is that population growth is not promoting economic growth for SSA. This finding is consistence with the findings of Ahmed and Huseyn (2007) which shows a negative relationship between population growth and economic growth.

## 5. CONCLUSION

The main objective of this study is to empirically analyse the relationship between trade liberalisation and economic growth for Sub-Saharan Africa. To achieve the objective, a cross-sectional-time series (panel) data was generated for 1970-2010 periods. The study uses fixed and random effects as techniques for data analysis. Therefore, based on the findings of this study, trade liberalisation and foreign direct investment are positively related to the economic growth in Sub-Saharan Africa. This implies that SSA countries can vigorously pursued outward looking policies aimed at financing their economic growth. Trade could serve as engine of growth to Sub-Saharan countries and so they should especially be traded among themselves for mutual benefits.

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