Non-Oil Exports and Economic Growth in Selected African Countries

David Terfa Akighir Phd [*], Tarlumun Aondoakura Joeseph [**]

Department Of Economics, Benue State University Makurdi, Nigeria

DOI: 10.29322/IJSRP.9.06.2019.p90130
http://dx.doi.org/10.29322/IJSRP.9.06.2019.p90130

Abstract- This study investigates the relationship between non-oil exports and economic growth in selected African countries which include Algeria, Angola, Cameroun, Chad, Egypt, Equatorial Guinea, Ghana, Libya, Republic of Congo, Nigeria and Sudan from 1986-2018. The study has employed the Dynamic Panel Data Models and findings revealed that non-oil exports have positive relationship with economic growth in all the countries except Gabon in the long-run. The estimated coefficients are however not statistically significant at 5% level of significance. The study also found that there is positive impact of non-oil exports on economic growth in Angola, Egypt, Equatorial Guinea, Gabon, Libya, Nigeria, Republic of Congo and Sudan in the short-run while there is negative influence in Algeria, Cameroun, Chad and Ghana in the short-run. It is concluded from the findings of the study that non-oil exports have positive influence on economic growth in most selected African countries, although not significant. The study therefore, recommends that the African oil producing countries and oil producing countries generally should improve their production and exports of non-oil products relatively more than imports of these products. The products should also have international standard that could stand competitive at the world market. This would help to increase foreign earnings that could contribute positively to economic growth in one way, absorb the oil price shocks and create domestic jobs for the economy in another way.

Index Terms- African Countries, Dynamic Panel Models, Economic growth, and Non-oil Exports

JEL Classification Codes: F, F14, F21, F31

I. INTRODUCTION

The significance of exports to international trade and economic growth is an issue that has been of interest to economists even before the days of Adam Smith. Abou-Stait (2005) asserts that exports are catalysts necessary for the overall development of an economy; when export sectors are developed, employment opportunities for the people are created and the standard of living is improved. Increased exports earnings help in lessening the pressure on balance of payment disequilibrium. Similarly, Usman and Salami (2008) opined that export helps in increasing the level of aggregate economic activities through its multiplier effects on the level of national income. Studies by Abu-Qarn and Abu-Bader (2004); and Bahmani-Oskooee and Economidou (2009) suggested that in most developing countries, there is a positive long-run relationship between exports and economic growth.

In Africa, between 1995 and 2010, Africa's total exports increased from US$ 57 billion to US$ 169 billion and were essentially driven by exports to Asia-Pacific and to the rest of the World. Even though Africa's export revenues have been rising in the last two decades, its overall export performance as a share of the world total has been persistently declining during this same period. Specifically, Africa's share of total world exports plummeted from 4.1 percent in 1981 to 1.7 percent in 1998, only rising slightly to 2.4 percent in 2009 (Mutenyo, 2011). Over this entire period, Africa has on average only accounted for about 2 percent of total global exports, of which 30 percent is attributed to South Africa. Africa's export performance is in sharp contrast to that of China. While China's exports accounted for 1.1 percent of total global exports in 1981, its share had risen to 9.8 percent by 2009 (Mutenyo, 2011). According to West African economic outlook (2018), all countries in the region except Côte d'Ivo-ire, Guinea-Bissau, and Nigeria recorded negative net exports—importing more goods than they exported. In 2018, net exports reduced West Africa's real GDP growth by 1.5 percentage points. While exports have been found to be growth enhancing in Africa, the reverse is the case for imports, pointing to the need to limit them. To the extent that imports comprise investment or intermediate products, they may contribute to growth. But excessive imports of consumer products may be detrimental to growth. Efforts to achieve a positive external balance would greatly benefit from export promotion policies, especially ones targeted at diversifying from exporting primary commodities.

However, African exports are not diversified with 80 percent of its exports concentrated in oil, minerals and primary agricultural commodities. Fuel and minerals alone account for over 50 percent of Africa's total exports. Broken down by country, it is clear that the region's exports are consistently dominated by primary agricultural commodities, natural resources and minerals. For instance, Nigeria's non-oil exports amounted to about $3.0 billion (₦486 billion) in 2013 (Abiodun, 2014). In a similar way, the share of Angola's non-oil exports reduced from 86.6% in 1980 to 22% in 1987 respectively. By 2015 the percentage of non-oil exports to total exports was 5% in 2015 (World Bank, 2017). Similarly, Cameroon had 99.96% of the share of non-oil exports in 1970. However, the proportion of the non-oil exports declined to 55.4% in 2015 (World Bank, 2017). Many other African countries such as Gabon, Congo, Ghana, Sudan, Egypt, Equatorial Guinea and Chad had declining share of non-oil exports as compared to oil exports while Algeria and Nigeria experienced

declining share of non-oil exports from 1980 to 2000 with sudden upsurge in 2015 (World Bank, 2017). Africa's lack of export diversity and dependence on commodities are further compounded by its share of industry to total GDP, which declined from 37 percent in 1981 to 33 percent in 2010 (Mutenyo, 2011). Accordingly, Gylfason (2006) noted that the oil dependency syndrome made oil producing countries realize that relying on only the oil sector was not an economically sustainable strategy, and that other ways should be sourced. This can be achieved through diversification of a productive base and promotion of non-oil exports.

Oil as well as other non-renewable resources will eventually be exhausted, the price, which fluctuates considerably, implies that selected African Countries understudy such as Algeria, Angola, Cameroun, Chad, Egypt, Equatorial Guinea, Ghana, Libya, Republic of Congo, Nigeria and Sudan has faced a series of external shocks in the last three decades. Indeed, Africa is well aware that its oil resources will at some time be exhausted. This fact makes government of selected African Countries to realize that, the bases of her economies are very weak as long as their economies continue to depend on the export of a single depleting commodity, since continued dependence on oil revenue for socio-economic development is not a reliable option in the long term and hence the urgent need for non-oil exports development/economic diversification. The effects of over-dependence on oil on Africa Countries was witnessed from fall in growth rate of gross domestic product, the deterioration of the nation's public accounts, and the decline in export earnings (Macuta, 2015).

More recently, the drop in the price of crude oil in 2016 coupled with United States entry into the world market and the global issue of oil over supply has adversely affected the economic performance of most oil producing nations as their industrial, construction and services sectors adjusted to cuts in private consumption and public investment amid limited availability of foreign exchange (African Economic Outlook, 2017).

It is against this background that this study examined the causal relationship and the impact of non-oil exports on economic growth in these selected African countries.

II. Theoretical Review

This study is hinged on the Export-Led Growth Hypothesis. According to the international trade theory, exports can contribute to economic performance through many channels". As Adams Smith (1776) postulated, "international trade improves productivity by enhancing market size and enjoying economies of scale". Furthermore, David Ricardo (cited in Akmal & Ali, 2013) opined that international trade plays an important role in economic growth. A country can attain specialization in the production of a good through trade in which it is comparatively advantaged. This attained specialization may perk up the efficiency of resources exploitation by raising the capital formation which improves the total factor productivity (TFP).

Hassan (2011) in his description of export-led growth hypothesis admits that expansion in exports of a country can lead to the economic growth of the country. He affirms that the overall growth of economies does not owe to increase in the labor and capital stock only, but also expansion in exports. This approach, according to Hailegiorgis (2012) leads to better resource allocation, creating economies of scale and production efficiency through technological development, capital formation, employment creation and hence economic growth. The choice of this framework in this study is owed to the fact that it stresses that long run growth depends on export of resources that have a lifespan. First, that the export sector may generate positive externalities on non-export sectors through more efficient management styles and improved production techniques (Feder, 1982). Second export expansion will increase productivity by offering potential for scale economies (Helpman and Krugman, 1985; Krugman 1997). Secondly, exports are likely to alleviate foreign exchange constraints and can thereby provide greater access to international markets (Esfahani, 1991). These arguments have recently been extended by the literature on "endogenous" growth theory which emphasizes the role of exports on long-run growth via a higher rate of technological innovation and dynamic learning from abroad (Grossman and Helpman, 1991, 1995). Marin (1992) found that countries exporting a large share of their output seem to grow faster than others. The growth of exports has a stimulating influence across the economy as a whole in the form of technological spillovers and other externalities (Bhagwati, 1988). Models by Grossman and Helpman (1991), posit that expanded international trade increases the number of specialized inputs, increasing growth rates as economies become open to international trade. Buffie (1992) considers how export shocks can produce export-led growth.

III. Empirical Framework

Onodugo and Anowor (2016) carried out a study to investigate the specific impact of the non-oil exports to the growth of Nigerian economy using data between 1981 and 2012. The study adopted the Augmented Production Function (APF), employing the Endogenous Growth Model (EGM) in its analysis. The conventional tests for mean reversion and co-integration were employed. Findings reveal a very weak and infinitesimal impact of non-oil export in influencing rate of change in level of economic growth in Nigeria.

Adel (2015) investigated the role of oil and non-oil exports in the Syrian economy over the period 1975-2010. Using Johansen Co-integration test, Granger causality test, Impulse response functions (IRF) and variance decomposition analysis, the results showed that GDP is positively and significantly related to oil and non-oil exports. The Granger Causality test indicated bi-directional short-run causality relationship between GDP, oil exports and non-oil exports. There are also bi-directional long-run causality relationships between GDP and non-oil exports, and unidirectional long-run causality relationship running from oil exports to GDP.

Abogan, Akinola and Baruwa (2014) investigated the impact of non-oil exports on economic growth in Nigeria between 1980 and 2010. The study used the Ordinary Least Square Methods involving Error correction mechanism. The study revealed that the impact of non-oil exports on the economic growth was moderate. It was evident in the study that the policies on non-oil sectors during the period in Nigerian do not sufficiently encourage non-oil exports, thus reduce their contributions to growth.

Ifeacho, Omoniyi and Olufemi (2014) analyzed the role of non-oil exports on economic development of Nigeria. The study used per capita income as proxy for economic development and expressed it as a function of non-oil export volume, trade openness, exchange rate and inflation rate. The study used the Ordinary Least Square Technique and the results showed that non-oil export exhibits a significant and positive relationship with per capita income.

Ezike and Ogege (2012) investigated Nigeria foreign trade policy and its impact on non-oil exports. The study used both correlation analysis and least square techniques to analyze data from 1980-2009. Their findings showed that there is a negative relationship between trade policies and non-oil exports in Nigeria. However, non-oil exports have positive effect on economic growth in Nigeria; also exchange rate is positive and significant at 5% level of significance. Mustapha (2013) carried out a study to examine the effect of non-oil exports on the agricultural sector performance in Nigerian economy from 1980-2011. Modern econometric analysis was used to validate if there is any relationship between non-oil exports and sectoral performance, the results revealed that non-oil export commodities fail to enhance growth of the economy in their findings, while agriculture, openness and exports promote growth in both the short and long run.

IV. Methodology of the Study

The study has employed the Dynamic Panel Data Models because of the nature of dynamism of the macroeconomic indicators. This framework has the following techniques or estimators; Generalized Method of Moments (GMM) (either First Difference GMM or System GMM, that is; the Arellano-Bond estimator and the Arellano-Bover/Blundell-Bond estimator), Mean Group (MG), Pooled Mean Group (PMG) and Dynamic Fixed Effects (DFE) (Bun & Sarafidis, 2013). Other panel techniques include: Seemingly Unrelated Regression (SUR), Swamy's random coefficient model and Mean group estimation (Muck, 2016). But, Panel GMM is applicable to the cases in which the number of periods is small relative to the number of cross-sectional observations (T < or = N). Otherwise-asymptotic imprecision and biases may arise (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998). Since the number of time dimensions for this research is relatively larger than cross sections (T >N), that is, for large T, Pesaran and Smith (1995) show that the traditional panel techniques [Fixed Estimator (FE), Instrumental Variables (IV), GMM estimators] can produce inconsistent, and potentially very misleading estimates of the average values of the parameters in dynamic panel data model unless the slope coefficients are in fact identical, hence, the need for analyzing the long-run effects and the speed of adjustment to the long-run. Also, since the overriding interest is to account for long-run effects or impact of non-oil exports on economic growth among selected African countries, the study used Panel ARDL or non-stationary heterogeneous panel data.

V. Specification of the Model

In order to capture the impact of Non-oil Exports on the economic growth of some selected African countries, this study has adopted a Keynesian Growth Model in linkage with the Export Led Growth hypothesis.

In a simple Keynesian Model

$$Y = C + I + G + (X - M) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 1$$

Where:

Y is GDP, the sum total of the market value of goods and services produced in a country;

C represents consumption expenditures, expenditures by household sector on currently produced final goods and services;

I represent Investments;

G is total government expenditures as a share of GDP;

X represents total exports;

M is total imports;

But,

$$X = X_{oil} + X_{Noil} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad -2$$

Where;

X_{oil} represents Oil Exports;

$X_{Noil}$is Non-Oil Exports;

Substituting equation 2 in equation 1, we have;

$$Y = C + I + G + X_{oil} + X_{Noil} - IMP \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad -3$$

Furthermore, Foreign Direct Investment (FDI) and Exchange rate (EXR) are also foreign components that have impact on economic growth (determinants of economic growth). Hence, if we include FDI and EXR in equation 3; the functional model becomes:

$$Y_t = f(C_t, I_t, G_t, X_{oil_t}, X_{Noil_t}, M_t, FDI_t, EXR_t) \quad - \quad - \quad - \quad - \quad - \quad - \quad 4$$

Specifying the above econometric model of the growth equation (4) and using other similar acronyms with natural logarithm transformation, it is explicitly re-written as:

$$lnGDP_t = \alpha_0 + \alpha_1 lnPVC_t + \alpha_2 lnINV_t + \alpha_3 lnGEX_t + \alpha_4 lnOIL_t + \alpha_5 lnNOIL_t + \alpha_6 lnIMP_t + \alpha_7 lnFDI_t + \alpha_8 lnEXR_t + \eta_i + v_{it} \quad - \quad - \quad - \quad - \quad -5$$

Where:

Y=GDP=Gross Domestic Product

C=PVC=Private Consumption Expenditures (current);

I=INV= Gross Fixed Capital Formation, private sector (current);

G=GEX= Government Spending or Expenditures;

X_{oil}=OIL=Oil Exports (current)

X_{Noil}=NOIL= Exports of Non-oil (current)

M=IMP= Imports of goods and services (current)

FDI=Foreign direct investment

EXR=Exchange Rate: local currency units per U.S. dollar.

ln= Natural Logarithm

α_0 = Intercept

$\alpha_1 - \alpha_8$ = Parameter Coefficients to be estimated

η_i = Individual Specific Effect or Fixed Effect

v_{it} = An idiosyncratic error

Following a linear dynamic panel data model which considers an autoregressive panel data model of the form (Blundell, Bond & Windmeijer, 2009):

$$y_{it} = \propto y_{it-1} + \beta' x_{it} + U_{it} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 6$$

$$U_{it} = \eta_i + \mathrm{v}_{it} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 7$$

Where $i = 1, \dots, N$ and $t = 2, \dots, T$. Where $\eta_i + \mathrm{v}_{it}$ is the usual 'error components' decomposition of the error term; N is large, T is fixed and $/\propto/ < 1$. The above model specification is therefore sufficient to cover most of the standard cases encountered in linear dynamic panel application and allows the inclusion of x_{it-1} that provides the autoregressive panel data model as:

$$y_{it} = \propto y_{it-1} + \beta_1' x_{it} + \beta_2' x_{it-1} + \eta_i + \mathrm{v}_{it} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 8$$

Applying the above typical linear dynamic panel model to equation 5 in examining the impact of non-oil exports on economic growth of some selected African countries, the model is re-stated as:

$$lnGDP_t = \alpha_0 + +\partial lnGDP_{it-1} + \alpha_1 lnPVC_{it} + \alpha_2 lnINV_{it} + \alpha_3 lnGEX_{it} + \alpha_4 lnOIL_{it} + \alpha_5 lnNOIL_{it} + \alpha_6 lnIMP_{it} + \alpha_7 lnFDI_{it} + \alpha_8 lnEXR_{it} + \eta_i + \mathrm{v}_{it} \quad - \quad - \quad - \quad 9$$

Where

α_0 = Intercept

$\alpha_1 - \alpha_8$ = Parameter Coefficients to be estimated

η_i = Individual Specific Effect or Fixed Effect

v_{it} = An idiosyncratic error

The equation 9 is re-specified to capture the error correction term ($ec_{i,t-1}$), the long-run equilibrium and the individual heterogeneity of the coefficients to be estimated as follows:

$$lnGDP_{it} = ec_{i,t-1} + \sum_i^1 \delta_i lnGDP_{it-1} + \sum_t^1 \alpha_{1i} lnPVC_{it} + \sum_t^1 \alpha_{2i} lnINV_{it} + \sum_t^1 \alpha_{3i} lnGEX_{it} + \sum_t^1 \alpha_{4i} lnOIL_{it} + \sum_t^1 \alpha_{5i} lnNOIL_{it} + \sum_t^1 \alpha_{6i} lnIMP_{it} + \sum_t^1 \alpha_{7i} lnFDI_{it} + \sum_t^1 \alpha_{5i} lnEXR_{it} + \alpha_{1i} lnPVC_{it} + \alpha_{2i} lnINV_{it} + \alpha_{3i} lnGEX_{it} + \alpha_{4i} lnOIL_{it} + \alpha_{5i} lnNOIL_{it} + \alpha_{6i} lnIMP_{it} + \alpha_{7i} lnFDI_{it} + \alpha_{8i} lnEXR_{it} + \eta_i + \mathrm{v}_{it} \quad - \quad - \quad - \quad - \quad - \quad 10$$

Where the error correction version of the equation 10 yields the following:

$$lnGDP_{it} = ec_{i,t-1} + \sum_i^1 \delta_i lnGDP_{it-1} + \sum_t^1 \alpha_{1i} lnPVC_{it} + \sum_t^1 \alpha_{2i} lnINV_{it} + \sum_t^1 \alpha_{3i} lnGEX_{it} + \sum_t^1 \alpha_{4i} lnOIL_{it} + \sum_t^1 \alpha_{5i} lnNOIL_{it} + \sum_t^1 \alpha_{6i} lnIMP_{it} + \sum_t^1 \alpha_{7i} lnFDI_{it} + \sum_t^1 \alpha_{8i} lnEXR_{it} + \eta_i + \mathrm{v}_{it} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 11$$

Where $ec_{i,t-1}$ measures how long it takes the system to converge to its long-run equilibrium in due to any distortion that may arise.

This study assumed that the explanatory variables have contemporaneous effect (that is, the current value of GDP depends on the current value of explanatory variables) while the dependent variable is allows for inter-temporal effect (that is, $ln\mathrm{GDP}_t$ depends on either the current and/or lagged values of $ln\mathrm{GDP}_t$). The coefficients on the contemporaneous and lagged variables are combined to obtain a long-run effect

Given that the lagged value of GDP ($ln\mathrm{GDP}_{i,t-1}$) is also the function of these effects (individual specific effects and disturbance term), $ln\mathrm{GDP}_{i,t-1}$ is correlated with the error term, that is, E($ln\mathrm{GDP}_{it-1}, v_{it}$), Hence, the application of OLS estimator is biased and inconsistent even if the error term U_{it} is not serially correlated. And for the application of Fixed Effect estimator, although with transformation might have eliminated the effects, however, ($ln\mathrm{GDP}_{it-1} - ln\overline{\mathrm{GDP}}_{i.-1}$), where $ln\overline{\mathrm{GDP}}_{i.-1} = \sum_{t=2}^{T} \frac{\overline{\mathrm{GDP}}_{i.-1}}{T-1}$ will still be correlated with $v_{it} - \bar{v}_{i.}$even if the error term v_{it} is not serially correlated which by construction, $ln\mathrm{GDP}_{it-1}$ is correlated with$\bar{v}_{i.}$ since latter average contains v_{it}that is obviously correlated with$ln\mathrm{GDP}_{it-1}$. Similarly, v_{it} is correlated with $ln\bar{Y}_{i.-1}$ since the latter average contains $ln\mathrm{GDP}_{it}$. This correlation also renders the Fixed Effect Estimator inconsistent. The Generalised Least Squares (GLS) method like Least Squares Dummy Variable (LSDV) estimator of estimation of the random effects model to estimate dynamic panel data models will also produce similar results of fixed effect model. Although, the GLS estimator involves quansi-demeaning the data, however, this demeaning process also unavoidably causes the quansi-demeaned dependent variable to be correlated with the quansi-demeaned residuals, and therefore the GLS estimator will also be biased and inconsistent.

Hence, to overcome these econometric problems inherent in the use of OLS, FE (LSDV) and GLS estimators for the above dynamic panel data models, the use of the Arellano and Bond (1991) Generalised Method of Moment (GMM) estimator, Blundell and Bond (1998) system GMM estimator, Mean Group, Pooled Mean Group and Dynamic Fixed Effects becomes the alternatives (Bun & Sarafidis, 2013). But since the number of time series for this research is relatively large than cross section (T >N), Mean Group, Pooled Mean Group and Dynamic Fixed Effects sometimes referred to as Panel Autoregressive Distributed Lag (ARDL) Models is most preferred or Panel SUR.

The apriori expectations of the coefficient of the model specified in 3.10 is as follows:

$$\alpha_1 > 0, \quad \alpha_2 > 0, \quad \alpha_3 > 0, \quad \alpha_4 > 0, \quad \alpha_5 > 0, \alpha_6 < 0, \quad \alpha_7 > 0, \quad \alpha_8 < 0$$

VI. Panel Unit Root Test Results

In order to determine whether series are having the problem of unit root in this study, panel data for all the variables were subjected to panel unit root tests using Levin, Lin and Chu (2002), Im, Perseran and Shin (2003) and Hadri (2000) panel unit root test. The selection of these unit root tests was based on the fact that Levin, Lin and Chu (LLC) (2002) and Hadri (2000) assumes that the persistent parameters are common across cross-sections while Im, Peseran and Shin (IPS) assumes that the parameters vary freely across sections, hence has gained superseding importance among the procedure of testing for unit root in this panel data since emphasis is placed on individual heterogeneity among the countries. The results obtained are presented in Table 1.

Table 1. Panel Unit Root Tests Results

Variables	Livin, Lin and chu (LLC)		Hadri LM		Im, peseran and shin (IPS)			Remark
Variables	Adjusted t-statistic	probability value	Z-Statistic	Probability Value	W-t-bar Statistic	Probability Value	Order of Integration	Remark
LogeGDP	1.1366	0.8721	62.7584	0.0000	4.7863	1.0000		Not Stationary
D.LogeGDP	-3.3864	0.0004	3.2404	0.0006	-5.2474	0.0000	I(1)	Stationary
logePVC	-2.9910	0.0014	60.6942	0.0000	1.3356	0.9092		Not Stationary
D.PVC	-3.6609	0.0001	8.7110	0.0000	-6.0452	0.0000	I(1)	Stationary
logeINV	-1.1705	0.1206	56.2510	0.0000	-1.5440	0.1407		Not Stationary
D. logeINV	-21.8243	0.0000	2.2693	0.0116	-14.1425	0.0000	I(1)	Stationary
logeGEX	1.0373	0.8502	56.8032	0.0000	3.2013	0.9993		Not Stationary
D. logeGEX	-5.2470	0.0000	-0.1464	0.5582	-6.9401	0.0000	I(1)	Stationary
logeOIL	-0.5561	0.2891	22.0931	0.0000	0.4001	0.6555		Not Stationary
D. logeOIL	-7.8291	0.0000	-2.4959	0.9937	-9.9844	0.0000	I(1)	Stationary
logeNOIL	-0.3264	0.3721	48.6690	0.0000	1.2620	0.8965		Not Stationary
D. logeNOIL	-8.6439	0.0000	-1.9023	0.9714	-11.1660	0.0000	I(1)	Stationary
logeIMPT	-0.4110	0.3405	59.7375	0.0000	2.4155	0.9921		Not Stationary
D.l0geIMPT	-4.7218	0.0000	0.7071	0.2398	-6.9609	0.0000	I(1)	Stationary
logeFDI	-0.8950	0.1854	17.9299	0.0000	-0.8534	0.1967		Not Stationary
D.logeFDI	-8.3067	0.0000	-2.5786	0.9950	-10.6094	0.0000	I(1)	Stationary
logeEXR	-1.6746	0.0470	56.9917	0.0000	0.5146	0.6966		Not Stationary
D. logeEXR	-5.5255	0.0000	2.1527	0.0157	-7.0017	0.0000	I(1)	Stationary

Source: Computations from STATA 14.2 Output

The results in Table 1 show the panel unit root or stationary tests. The results indicate that all the panels contain unit roots at levels except for Gross Fixed Capital Formation (INV) as reported by the Levin, Lin and Chu (LLC) test and Im, Peseran and Shin (IPS) test. More so, Hadri LM test shows non-stationary panels for GDP, PVC, INV and EXR at levels and first difference. But, based on the majority of the results with special attention to Im, Peseran and Shin panel unit root test results, the researcher conclude that some panels are stationary at first difference. Thus, the null hypotheses that all panels contain unit roots for Levin, Lin and Chu (LLC) and Im, Peseran and Shin (IPS) are rejected at first difference while for Hadri LM test, the null hypotheses for most of the panels cannot be rejected at 5% level of significance as indicated in Table 1. Deducing from the results in Table 1, the panels were estimated at first difference in order to yield robust results.

Panel Granger Non-Causality Test Results

This study examines the panel granger non-causality test among the variables incorporated in the study but paying particular attention to the test of granger non-causality test between economic growth (GDP) and non-oil exports (NOIL). The results are presented in Table 2

Table 2. Panel Causality Test Results (5% Level of Significance

Statistic	Variable X	Variable Y	Causality	Decision
	PVC	GDP		
Z-Bar(Prob Value)	23.2506(0.0000)	4.0568(0.0000)	⟷	Bidirectional
	IVC	GDP		
Z-Bar(Prob Value)	34.5352(0.0000)	26.332(0.0000)	⟷	Bidirectional
	GEX	GDP		
Z-Bar(Prob Value)	1.1049(0.2692)	16.029(0.000)	⟵	Unidirectional
	OIL	GDP		
Z-Bar(Prob Value)	5.5104(0.0000)	5.0390(0.0000)	⟷	Bidirectional

	NOIL	GDP		
Z-Bar(Prob Value)	5.8828(0.0000)	9.0910(0.0000)	⟷	Bidirectional
	IMPT	GDP		
Z-Bar(Prob Value)	12.0486(0.0000)	3.2435(0.0012)	⟷	Bidirectional
	FDI	GDP		
Z-Bar(Prob Value)	2.1245(0.0336)	6.2872(0.0000)	⟷	Bidirectional
	EXR	GDP		
Z-Bar(Prob Value)	17.0948(0.0000)	0.2538(0.7996)	←	Unidirectional
	INV	PVC		
Z-Bar(Prob Value)	11.4247(0.0000)	11.7597(0.0000)	⟷	Bidirectional
	GEX	PVC		
Z-Bar(Prob Value)	1.3444(0.1788)	8.087(0.0000)	←	Unidirectional
	OIL	PVC		
Z-Bar(Prob Value)	-0.0316(0.9748)	2.8384(0.0045)	←	Unidirectional
	NOIL	PVC		
Z-Bar(Prob Value)	6.9955(0.0000)	16.4925(0.0000)	⟷	Bidirectional
	IMPT	PVC		
Z-Bar(Prob Value)	8.1038(0.0000)	2.1389(0.0000)	⟷	Bidirectional
	FDI	PVC		
Z-Bar(Prob Value)	1.8562(0.0634)	5.1476(0.0000)	←	Unidirectional
	EXR	PVC		
Z-Bar(Prob Value)	4.3647(0.0000)	2.1533(0.0313)	⟷	Bidirectional
	GEX	INV		
Z-Bar(Prob Value)	14.8983(0.0000)	4.6803(0.0000)	⟷	Bidirectional
	OIL	INV		
Z-Bar(Prob Value)	2.4108(0.0159)	6.2696(0.0000)	⟷	Bidirectional
	NOIL	INV		
Z-Bar(Prob Value)	8.2487(0.0000)	13.5085(0.0000)	⟷	Bidirectional
	IMPT	INV		
Z-Bar(Prob Value)	7.6691(0.0000)	4.9989(0.0000)	⟷	Bidirectional
	FDI	INV		
Z-Bar(Prob Value)	2.7880(0.0053)	5.0622(0.0000)	⟷	Bidirectional
	EXR	INV		
Z-Bar(Prob Value)	4.6680(0.0000)	3.7980(0.0001)	⟷	Bidirectional
	OIL	GEX		
Z-Bar(Prob Value)	8.1510(0.0000)	1.5375(0.1242)	→	Unidirectional
	NOIL	GEX		
Z-Bar(Prob Value)	6.1648(0.0000)	5.8647(0.0000)	⟷	Bidirectional
	IMPT	GEX		
Z-Bar(Prob Value)	15.2805(0.0000)	-0.4668(0.6407)	→	Unidirectional
	FDI	GEX		
Z-Bar(Prob Value)	7.9530(0.0000)	9.3119(0.0000)	⟷	Bidirectional
	EXR	GEX		

Z-Bar(Prob Value)	8.9172(0.0000)	-0.2945(0.7684)	→	Unidirectional
	NOIL	OIL		
Z-Bar(Prob Value)	0.3811(0.7031)	9.4938(0.0000)	←	Unidirectional
	IMPT	OIL		
Z-Bar(Prob Value)	7.6430(0.0000)	6.6574(0.0000)	↔	Bidirectional
	FDI	OIL		
Z-Bar(Prob Value)	0.6944(0.4874)	5.0487(0.0000)	←	Unidirectional
	EXR	OIL		
Z-Bar(Prob Value)	8.9172(0.0000)	0.2945(0.7739)	→	Unidirectional
	FDI	NOIL		
Z-Bar(Prob Value)	4.4227(0.0000)	4.5056(0.0000)	↔	Bidirectional
	EXR	NOIL		
Z-Bar(Prob Value)	2.7041(0.0068)	2.2788(0.0227)	↔	Bidirectional
	IMPT	NOIL		
Z-Bar(Prob Value)	12.1282(0.0000)	1.3203(0.1867)	→	Unidirectional
	FDI	IMPT		
Z-Bar(Prob Value)	3.4085(0.0007)	10.8107(0.0000)	↔	Bidirectional
	EXR	IMPT		
Z-Bar(Prob Value)	6.5969(0.0000)	-0.2386(0.8114)	→	Unidirectional
	EXR	FDI		
Z-Bar(Prob Value)	2.0043(0.450)	-0.2252(0.8218)	✖	No Causality

Source: Computations from STATA 14.2 Outputs

The results of panel granger non-Causality test by Dumitrescu and Hurlin (2012) is judged at 5% level of significance. The result in Table4 shows that there is bidirectional relationship between non-oil experts and economic growth in selected African countries. This is because, the estimates reveal Z-bar statistic of 5.8828 and 9.091 with their respective probabilities of 0.0000 and 0.0000. This indicates that non-oil exports granger-causes economic growth at least in one country with feedback mechanism. The result also shows bidirectional relationship between PVC and GDP, INV and GDP, OIL and GDP and between FDI and GDP in selected African countries. The result also reveals unidirectional relationship running from GDP to GEX at 5% level of significance. This implies that GDP does granger-cause GEX for at least one country. The rejection of null hypothesis does not necessarily imply that the causality exists in all the panels or countries. It simply implies that there is granger-causality for at least one country in the panels.

Considering the causality relationship between other variables and PVC, there exists bidirectional relationship between INV and PVC, NOIL and PVC, IMPT and PVC, EXR and PVC at 5% level of significance. The result in Table 4 also reveals unidirectional relationship running from PVC to GEX, OIL and FDI for at least one country.

The result also shows two way causal relationships between GEX and INV, OIL and INV, NOIL and INV, IMPT and INV, FDI and INV and between EXR and INV. This implies that all other variables incorporated in the model granger-cause INV for at least one country and in a likewise manner, INV granger-cause all the variables for at least one panel.

The result in Table 2 further reveals unidirectional relationship running from IMPT and EXR to GEX but directional relationship between IMPT and GEX and between FDI and GEX OIL granger cause NOIL and FDI for at least one country while EXR granger cause OIL and IMPT without feedback effect. There also exists bidirectional relationship between FDI and IMPT. The results also reveal unidirectional relationship running from NOIL to IMPT and no causal relationship between EXR and FDI.

The implication of these results is that there exist inter dependence of the identified variables on others for at least one country. This does not necessarily show the incidence of endogeneity among all the panels. Hence, this study considers the one-way effect of non-oil exports on economic growth among the selected African countries.

VII. Impact of Non-oil Export on Economic Growth in selected Africa Countries

This section presents the results of panel ARDL also known as non-stationary heterogeneous panel models for the study. The study estimated the impact of non-oil exports on economic growth in selected African countries. Towards this end, the study employed and estimated Dynamic panel data models often referred to as non-stationary heterogeneous panel models. The framework has two estimators, viz: PMG and MG estimators and the justification of which estimator is preferred is done by the application of Hausman test. Table 3 contains the results of Hausman test by comparing the estimates of MG and PMG estimators to know whether the difference in the estimated coefficients between the two techniques employed are systematical or not. The rule of thumb is that if the probability value (chi-square) of the Hausman test is less than 0.05 (at 5% level of significance), the researcher rejects the null hypothesis (H_o: difference in coefficient not systematic) and conclude that the difference in coefficients is systematic and preferably, use MG estimator, otherwise, the researcher preferably, uses PMG estimator. Sigmamore was used in the specification and estimation of the Hausman test because it provides a proper estimate of the contrast variance for the so-called tests of exogeneity and over identification in instrumental variables regression.

Table 3 Hausman Test Results

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Mg	Pmg	Difference	S.E.
logePVC	0.090473	-0.37775	0.468225	0.7138492
logeIVC	0.051238	0.07823	0.4341506	0.635
logeOIL	-0.49809	-0.16088	-0.3372189	1.124
logeNOIL	0.428227	0.166109	0.2621184	0.295
logeIMPT	-0.23264	0.871137	-1.103782	0.587
logeFDI	-1.14554	-2.50899	1.363451	2.295
logeEXR	1.387046	1.526274	-0.1392278	1.871

b = consistent under Ho and Ha; obtained from xtpmg
B = inconsistent under Ha, efficient under Ho; obtained from xtpmg
Test: Ho: difference in coefficients not systematic
$chi^2(6) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B) = 14.17$
$Prob>chi^2 = 0.0482$
Source: Author's Computation from STATA 14.2 Output

The results in Table 3 showed the chi-square value of 14.17 with its probability value of 0.0482. Since the probability value of 0.0482<0.05 (at 5% level of significance), the null hypothesis that PMG estimator is preferred over the MG estimator is rejected. Following the deductions from the above based on Hausman test results; the study presents the estimates of Mean Group (MG) in examining the impact of non-oil exports on economic growth in selected African Countries. The Mean Group estimator presents the long-run and short-run estimates of the individual countries thereby allowing for heterogeneity of all the parameters without imposing any cross country restriction. Hence, the estimates for each country, averages of the country specific-coefficients that provide consistent estimates of the long-run coefficients are presented in Table 4.

Table4. Long-run Estimates (MG estimator)

Country	LogePVC	logeINV	logeOIL	LogeNOIL	logeIMPT	logeFDI	logeEXR
Algeria	-0.54543	-0.24715	-0.03707	0.094277	0.701274	-1.10558	0.993918
Probability	0.494	0.322	0.891	0.612	0.288	0.562	0.337
Angola	-0.71803	0.557094	-2.06099	1.431699	0.661469	0.092537	0.5005
Probability	0.537	0.553	0.671	0.553	0.256	0.757	0.562
Cameroon	-0.02147	0.323253	0.128964	0.319601	0.069137	0.637264	0.286312
Probability	0.976	0.383	0.194	0.101	0.788	0.553	0.336
Chad	0.526948	-0.07464	-0.03707	0.077545	0.200243	-0.32063	-0.01175
Probability	0.021*	0.335	0.644	0.646	0.255	0.645	0.972
Egypt	0.313741	0.024795	-0.06468	-0.00288	-0.04136	0.315866	-0.14167
Probability	0.000*	0.434	0.081	0.975	0.755	0.058	0.130
Eq. Guinea	-0.51769	-0.00704	0.14744	0.074171	1.164654	-1.27705	0.613744
Probability	0.018*	0.946	0.004*	0.523	0.000*	0.343	0.259
Gabon	0.561654	-0.0607	0.239244	-0.22817	0.207003	-0.76477	-0.19698
Probability	0.009*	0.690	0.396	0.190	0.518	0.674	0.477
Ghana	-1.07813	0.072067	3.32907	1.441512	0.263047	-2.21292	1.437061
Probability	0.670	0.655	0.688	0.662	0.707	0.713	0.593
Libya	-1.79407	2.609979	5.38042	1.378354	-1.37034	-15.329	13.52807

Probability	0.885	0.892	0.890	0.897	0.911	0.898	0.889
Nigeria	0.139512	3.755699	1.094337	0.01884	0.004654	0.296097	0.084951
Probability	0.564	0.152	0.136	0.87	0.971	0.284	0.684
R. Congo	4.21366	-0.78731	3.986154	0.5469	-3.2637	5.552934	-0.61146
Probability	0.929	0.943	0.933	0.926	0.933	0.939	0.914
Sudan	0.004971	-0.01749	0.368364	0.024555	-1.38786	0.36869	0.161856
Probability	0.969	0.837	0.038	0.874	0.306	0.789	0.06

Source: Author's Computation from STATA 14.2 output

Note: Note: The first figure in each cell is the estimated coefficient while the second is its probability value. This study uses 5% level of significance upon which the statistical significance of the estimated variables can be examined. The asterisk (*) denotes rejection of no statistical significance at 5% critical level.

Table 5. Short-run estimates

Country	Ec	llogeGDP	logePVC	logeINV	logeOIL	logeNOIL	logeIMPT	logeFDI	logeEXR	C
Algeria	-0.1664	-0.1598	-0.1178	0.1062	0.0206	-0.0097	-0.0016	0.0304	-0.1503	-1.9836
Probability	0.3440	0.6590	0.3430	0.0960	0.5130	0.4980	0.9820	0.8630	0.0010*	0.3690
Angola	-0.8935	-0.0056	0.0458	-0.0215	0.0844	0.0380	-0.6060	-0.0126	-0.0759	-1.1632
Probability	0.5660	0.9810	0.0130*	0.2140	0.5050	0.4450	0.5700	0.5700	0.3710	0.3340
Cameroon	-0.2016	-0.3906	-0.1052	-0.0753	0.0010	-0.0081	0.0155	-0.1625	0.0001	-3.6157
Probability	0.1250	0.2380	0.3640	0.0780	0.9550	0.8200	0.6590	0.3540	0.9980	0.1770
Chad	-0.9064	-5707702	-0.1289	0.1534	0.1764	-0.0378	-0.3384	-0.2432	-0.1178	1.2166
Probability	0.0020*	0.0200*	0.9560	0.0850	0.0520	0.6600	0.0260*	0.6000	0.1650	0.2210
Egypt	-0.2539	-0.4657	0.0465	-0.0066	0.0115	0.0044	-0.0207	-0.0501	-0.0090	-0.6881
Probability	0.0170*	0.0420*	0.3160	0.4670	0.0750	0.7810	0.4510	0.0080*	0.6770	0.1280
Eq. Guinea	-0.4776	-0.6197	0.1481	-0.1645	0.0389	0.0727	-0.3930	-0.4613	0.0721	-5.1812
Probability	0.0000*	0.0010*	0.4270	0.7240	0.0210*	0.1400	0.0040*	0.3750	0.4320	0.2100
Gabon	-0.4905	-0.6735	-0.0689	0.0050	0.1036	0.0375	-0.0552	0.3758	0.0412	1.3208
Probability	0.0880	0.0110*	0.6370	0.9350	0.5500	0.2990	0.6660	0.5070	0.5050	0.1700
Ghana	-0.0583	-0.5087	0.0215	-0.0040	0.1497	-0.5297	0.0121	0.3379	0.1674	-4.6188
Probability	0.6580	0.0190*	0.3830	0.6170	0.0060*	0.1590	0.6340	0.0050	0.6950	0.2260
Libya	-0.0348	0.7498	0.0014	-0.3801	0.5037	0.0812	0.5767	0.0218	-0.3075	2.6477
Probability	0.8890	0.0010*	0.9860	0.7810	0.0000*	0.2520	0.0690	0.9590	0.6560	0.2620
Nigeria	-0.4407	-0.3149	0.0080	46.1926	0.2187	0.0013	-0.0657	-0.2197	-0.0545	-45.5743
Probability	0.0530	0.3290	0.9280	0.0530	0.3100	0.9710	0.1630	0.2090	0.3470	0.2980
R. Congo	-0.0152	-0.2683	-0.2325	-0.0395	0.0886	0.0085	0.0720	-0.0509	-0.0884	17.5833
Probability	0.9320	0.2990	0.6630	0.3570	0.4090	0.6910	0.1930	0.7970	0.6270	0.2550
Sudan	-0.4782	-0.7732	-0.3761	0.2554	0.4530	0.0229	0.0192	-0.3161	-0.1331	-14.2420
Probability	0.2410	0.0310*	0.1340	0.1730	0.1230	0.6590	0.9580	0.6480	0.5860	0.0200*

Source: Authors' Computation from STATA 14.2 output
Note: Note: The first figure in each cell is the estimated coefficient while the second is its probability value. This study uses 5% level of significance upon which the statistical significance of the estimated variables can be examined. The asterisk (*) denotes rejection of no statistical significance at 5% critical level.

The study found that non-oil exports have positive relationship with economic growth in all the countries except Gabon in the long-run. The estimated coefficients are however not statistically significant at 5% level of significance. The negative influence of non oil on economic growth in Gabon is attributed to

limited expansion of the secondary and tertiary sectors impacted by the decline in public expenditure (World Bank Group 2017). Also, the poor quality of Gabon's business climate is a major barrier to diversification or low performance of the non-oil sector of its economy. Gabon is ranked 167 out 190 countries in the 2018 doing business report. This implies that increase in non-oil exports do not contribute significantly to the growth of Algeria, Angola, Cameroon, Chad, Egypt, Equatorial Guinea, Ghana, Libya, Nigeria, Republic of Congo and Sudan. This study findings is consistent with the findings of Onodugo and Anowor (2016), Adel (2015), Ezike and Ogege (2012), Adesoji and Sotubo (2013) and Mehrara, Musai and Nasibparast (2012) who found positive but weak or insignificant long-run relationship of non-oil exports and economic growth.

The study also found that there is positive impact of non-oil exports on economic growth in Angola, Egypt, Equatorial Guinea, Gabon, Libya, Nigeria, Republic of Congo and Sudan in the short-run while there is negative influence in Algeria, Cameroun, Chad and Ghana in the short-run. The relationship was not statistically significant in any of these countries. This result is similar with the findings of Mehrara, Musai and Nasibparast (2012) who found positive but statistically insignificant short-run impact of non-oil exports on economic growth. This is attributed to the low performance of the non-oil sector and the nature of the non-oil exports that are often less competitive at the international market, implying that, selected African countries often use traditional system where agricultural production and even extractions have been crude in nature.

The relationship of oil export and economic growth is significant in Equatorial Guinea, Ghana and Libya in the short-run. However, the study revealed a positive but not significant influence of oil exports in Cameroun, Equatorial Guinea, Gabon, Ghana, Libya, Nigeria Republic of Congo and Sudan in the long-run and a negative influence in Algeria, Angola, Chad and Egypt in the long run. This study finding is similar with that of Esfahani, Mohaddes and Pesaran (2012) who suggested that oil has not contributed positively to long-run economic performance of oil-exporting countries. This implies that oil export is also beneficial to the selected African counties but the sector suffers shocks from changes in international oil price. That is, even though oil export is still a main driver of economic activities in most of these selected African oil-exporting countries, any change in oil prices has a drastic effect on their economic performance. This is because, while oil exporting developed countries all have some type of oil reserve funds (Buffers) to stabilize their economies, most oil-exporting developing countries still face this important challenge which can be attributed to in effective buffers to mitigate against the impact of oil price shocks.

This study reveals positive influence of exchange rate on the growth of selected African countries such as Algeria Angola, Cameroun, Equatorial Guinea, Ghana, Libya, Nigeria and Sudan in the long run. This implies that the countries recorded more value of imports than the value of exports leaving adverse effect and downward pressure on the country's currencies that often leads to devaluation of the currencies, hence, making the prices of imported goods and services to be high. This can be evidence by the high average exchange rate of Selected African countries to US dollar. However, Chad, Egypt, Gabon and Republic of Congo have a negative influence of exchange rate on the growth of their economies, though not statically significant at 5%.

Furthermore, the study revealed a positive influence of imports on economic growth on the economies of Algeria, Angola, Cameroun, Chad, Equatorial Guinea, Gabon, Ghana and Nigeria in the long run. And a negative influence of imports on the economies of Egypt, Libya, Republic of Congo and Sudan in the long-run. This study finding is similar with that of Mohammed (2017) who suggested that exports and imports promote economic growth in Panama.

The study also reveals a positive influence of foreign direct investment on economic growth on the economies of Angola, Cameroun, Egypt, Nigeria, Republic of Congo and Sudan in the long-run even the statistically it was insignificant at 5%. This conforms with the study of Kolawole and Okodua (2010) which suggests that foreign direct investment leads to economic growth in Nigeria. However, Algeria, Chad, Equatorial Guinea, Gabon, Ghana, and Libya recorded a negative influence of foreign direct investment on economic in their respective economies in the long-run though statiscally insignificant at 5%.

Similarly, Gross Fixed Capital Formation (INV) recorded positive influence on economic growth in the long-run on the economies of Angola, Cameroun, Egypt, Ghana, Libya and Nigeria in the long-run and a negative influence on economic growth on the economies of Algeria, Chad, Equatorial Guinea, Gabon, Congo and Sudan in the long-run but were insignificant at 5% level of significance. The study further revealed a positive relationship between Private Consumption Expenditure (PVC) and economic growth on the economies of Chad, Egypt, Gabon, Nigeria, Republic of Congo and Sudan while Algeria, Angola, Equatorial Guinea, Ghana and Libya recorded a negative influence of PVC on economic growth in the long-run respectively.

VIII. Conclusion and Policy Recommendations

Emergent from the foregoing it is concluded from the findings of the study that non-oil exports have positive influence on economic growth in most selected African countries, although not significant. This is because, the selected African countries have common characteristics of traditional system where agricultural production and even extractions have been crude in nature, and the consumer demand has been import dependent as well as monolithic exports. Due to the fact that, these oil exports have always been affected by external shocks of global oil price decline, there is need to compliment the oil exports and non-oil exports. The study therefore concludes that non-oil exports can contribute significantly to the growth of selected African countries.

The study therefore, recommends that the African oil producing countries and oil producing countries generally should improve their production and exports of non-oil products relatively more than imports of these products. The products should also have international standard that could stand competitive at the world market. This would help to increase foreign earnings that could contribute positively to economic growth in one way, absorb the oil price shocks and create domestic jobs for the economy in another way.

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AUTHORS

First Author – David Terfa Akighir is a lecturer with the Department of Economics Benue State University Makurdi, Nigeria. He holds a PhD in Economics specializing in International Finance and Macroeconometric Modelling. Email: akighirdavidterfa@gmail.com. Contact: +2348169587920.

Second Author – Tarlumum Aondoakura Joseph, holds a B.Sc. (Hons) in Economics and is currently a postgraduate student of the Department of Economics, Benue State University, Makurdi, Nigeria. Email: josephtarlumun@gmail.com. Contact: +2348132290878