The Growth Effect of External Sector
in Nigeria: Nexus of the Non-Oil Exports

**Bamidele A. Badejo[1], Olukayode E. Maku[2], Oluwaseyi A. Adelowokan[3], Olorunfemi,
Y. Alimi[4]**

Abstract: This study investigates the growth effects of external sector in Nigeria taking into consideration the role played by non-oil export commodities within the periods, 1980-2016. The Vector Error Correction Model (VECM) was employed to analyse the dynamic long-run and short-run estimates. The stationarity level of the variables at first difference and cointegration are confirmed prior VECM estimation. The results show that the parameter of non-oil export was positive and significant at 10% in the long-run indicating that the contribution of non-oil export commodity on output growth is weak. However, the parameter was positive and significant in the short-run at the conventional level. This implies that government policy should be directed towards increasing non-oil export commodities of agriculture, manufacturing and service industries with the aim of boosting output growth in Nigeria. The environment should be made favourable for local producers and investors to ease production and the distribution channels of goods and services to final consumers. The findings also showed that output growth was directly influenced by investment, labour force and government expenditure while negatively affected by exchange rate.

Keywords: Investment; labour force; non-oil export; government expenditure; exchange rate; GDP

JEL Classification: C13; E22; E62; F43

1. Introduction

The African trade performance was not predisposed to the level of development in the international market (World Bank, 2013). According to the data of the World Bank Group (2014), export growth in the first two quarters of 2012 was at 20.5% and 52.0% correspondingly. The growth rate of exports in the region contracted

[1] Professor, PhD, Department of Geography and Regional Planning, Olabisi Onabanjo University, Nigeria, Address: Ago-Iwoye, Ogun-State, Nigeria, E-mail: bamidelebadejo@gmail.com.

[2] Senior Lecturer, Department of Economics, Olabisi Onabanjo University, Nigeria, Address: Ago-Iwoye, Ogun-State, Nigeria, E-mail: kaymarks73@yahoo.co.uk.

[3] Lecturer I, Department of Economics, Olabisi Onabanjo University, Nigeria, Address: Ago-Iwoye, Ogun-State, Nigeria, E-mail: seyiadelowokan@gmail.com.

[4] PhD Candidate, Department of Economics, University of Lagos, Nigeria, Nigeria, Address: Lagos - Yaba, Lagos-State, Nigeria, Corresponding author: haleemphemy480@gmail.com.

annually at 33.8% due to global output slump in the third quarter. Likewise, the Central Bank of Nigeria (CBN, 2013) also posited that African exports represent an estimate of 3.2% of total world exports. The International Monetary Fund's World Economic Outlook further revealed that the total Gross Domestic Product (GDP) for all African countries amounted to about $5.2 trillion in 2013. The world as a whole has benefitted from exchange of goods and services, and the speed at which the effect of global village is spreading is fast day by day and no nation can afford to be behind if such a nation is to maintain acceptable rate of growth and development (Peter, 2002). With liberalization of the global market, export-led growth strategy has become a major focus for many African countries including Nigeria (Alimi, Yinusa & Ilo, 2016).

Before the discovery of oil in Nigeria, the non-oil export commodities mostly agricultural produces contributed greatly to the general development of her economy. Its share to the overall size of the economy however fell from 48% in 1970 to 15.5% in 1981 and currently hovering around 20% (CBN, 2009; Alimi, 2017). Apart from the country's dependence on oil, most of the Nigerian agricultural commodities have low linkages with the manufacturing industry and exported in primary forms. The relationship between non-oil export growth and economic growth in developing countries has been of continuing interest both in theoretical and empirical literature. A large number of empirical studies have been conducted during the last two decades to investigate the role of non-oil exports on economic growth using either time-series or cross-section data. These studies have been conducted along a number of divergent lines.

Over the years, few research studies have studied the causality between non-oil exports and economic growth using Granger causality tests. Thus, this study shows the bi-variate causality test between the non-oil exports and economic growth in Nigeria. Furthermore, it is worth mentioning that even with the policy driving force to expand the non-oil export base, there are few empirical studies on its impact on economic growth and no satisfactory result from previous attempt. This study therefore investigate the contribution of non-oil exports to the overall output growth in Nigeria seeing that the focus of both past and present government had shifted to export promotion economy from being import dependent. Other sections of this study are divided into four parts. The review of literature is presented in section while the third part discusses methodology. We present empirical results and discussion in section four and the concluding part is presented in the last part.

2. Literature Review

We reviewed relevant theories and previous empirical studies that are related to this study in this section. The export-led growth states that an economy that wants to improve on its output growth in the long-run must equally promote and expand its export capacity (Idowu, 2005). It is an inward oriented strategy for developing an economy that stands as a resourceful substitute to the import substitution strategy. The developing countries had earlier adapted the import substitution strategy to improve industrial development and also ensure sustainable growth by increasing locally made produces and merchandise, create employment and conserve foreign exchange (Alimi, 2017). Some of the prevailing features of the developing countries like large size of their domestic market resulting from population size, decline in world market for their primary goods, rising deficit on current account, and inadequate policy and measures to make producers explore the exports opportunity, make this strategy one of the prevailing tools used to boost output (Olorunshola, 1996).

Concerning growth theory, three waves of interest existed during the last five decades. The first was the Harrod-Domar impulse which was associated with the work of Harrod (1948) and Domar (1947) (Solow, 1994). The Neo-Classical Solow growth model constitutes the second wave while the last was the endogenous growth theory. This study found the Harrod-Domar model relevant to the developing economies and also for analysing the relationship between non-oil export production and economic growth. The growth theory stressed that the level of growth does not need any reason to be balanced. It further explains output growth as a function of capital productivity, level of savings and capital depreciation. It implies that the replacement of worn-out assets or impaired capital commodities necessitates the need for economies to save a certain proportion of her national income. This savings constituting new investment or capital stock either in human capital or other forms of productive assets will enhance the flow of income correspondingly.

We further review related and relevant studies using panel and time series data for both developed and developing economies. For three transition economies, Awokuse (2007) investigates how total trade (export and import) expansion influenced the output growth of Bulgaria, Czech Republic and Poland. They employed a panel multivariate cointegrated vector autoregressive (VAR) technique to establish the links between import, export and output. The finding provides support to import as an engine of output growth. The author nullifies the singular support of many previous studies for exports as the driver of growth and the exclusion of import. The study emphasized the important of import to growth in the three economies. Laszlo (2007) examines the relationship between real export and output in twenty-four OECD countries for the period of 1960 to 1997. The author employed Granger Causality test and the Seemingly Unrelated Regression (SUR) estimator to establish

the relationship between them. The results showed that export has a uni-causal relationship with output growth in Belgium, Demark, Iceland, Ireland, New-Zealand, Italy, Spain and Sweden.

For time series analysis, Pistoresi and Rinaldi (2011) examine the relationship between real imports, exports and output growth in Italy. They employed the cointegration and causality test approaches to evaluate the relationship within the periods, 1863-2004. The authors reported that the indicators have long-run relationship while their direction of causality varies over the periods. They concluded that both exports and imports drive output growth of the economy. Mahdavi and Fatemi (2007) established the relationship between non-oil export and economic growth in Iran using the ordinary least square method from 1959 to 2003. The result found that the impact of non-oil export on output growth is weak, likewise, the factor productivity level of non-oil export promotion.

Also, Abou-Stait (2005) investigates the export led growth hypothesis in the case of Egypt for the period of 1977 to 2003. The study used the Augmented Dickey-Fuller for stationarity test, Granger causality test for causal relationships, vector autoregression (VAR) for short-run impact and the impulse response function for response impact. The author discovered that there is no long-run relationship between exports, import and output measured by gross domestic product (GDP). The result further revealed that a uni-causal relationship running from export to output growth. The study established that GDP growth responded significantly to shock from export growth. Mohsen (2015) investigate the response of output growth to shock from oil and non-oil exports in Syria within the periods, 1975-2010. The study employed Johansen Cointegration test, Granger causality test, impulse response function and variance decomposition to establish the links. The author found a long-run relationship between the variables. The short-run causality results revealed bi-causal relations between oil export, non-oil export and output. The long-run causality result was bi-causal for non-oil export and output while the causality of oil export and output was uni-directional from former to later.

In Nigeria, Okodua and Ewetan (2013) test the validity of the export-led growth theory in Nigeria employing a time series data set from 1970 to 2010. Using the Granger causality test, they found that the causal relationship between export and output was uni-directional from the latter to the former. The study, therefore, rejects the export-led growth paradigm. Alimi, Yinusa and Ilo (2016) also examine the validity of export-led growth hypothesis in Nigeria using the VECM and VAR causality procedure developed by Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996). The result revealed that the existence of a uni-causal relationship running from export to growth in the long-run, while otherwise in the short-run. The finding suggests the support of export-led growth in the long-run while export was growth-driven in the short-run. While examining the impact of non-oil export on

economic growth, Abogan, Akinola and Baruwa (2014) employed the ordinary least squares (OLS) method and found that the relationship between them is moderate. Similarly, Nwachuckwu (2014) employed the OLS approach to examine how non-oil export strategies contributed to overall output growth in Nigeria using a time series data sets from 1970 and 2010. The indicators of non-oil export strategies used are tariff system measured by customs and excise duties, domestic credit provided by commercial banks and infrastructural development in transport and communication. The coefficients of tariff system and domestic credit provided by commercial bank were positive and significant at the conventional level. However, the parameter of infrastructure was also positive but not significant at 5%.

As well, Ijirshar (2015) investigate the impact of agricultural exports on economic growth in Nigeria for the periods, 1970-2012 using Johansen cointegration and error correction model (ECM). The findings from the Johansen cointegration test showed that a long-run relationship exit between the variables. The ECM result indicated that agricultural exports contribute to output growth in Nigeria. Igwe, Edeh and Ukpere (2015) investigate the effects of non-oil export on economic growth in Nigeria within the period of 1981 to 2012. They used Johansen cointegration, vector error correction model and Granger causality test to evaluate the links between the variables. The results revealed that there is a long-run relationship between non-oil exports and economic growth. The causality test result showed that non-oil export and output had no causal relations. However, capita Granger cause output while the latter Granger cause labour force. Adesoye, Adelowokan and Alimi (2018) investigate the relationship between non-oil export demand and economic performance in Nigeria. They used a time series data set from 1975 to 2013 and vector error correction model for short- and long- run estimates. The findings revealed that non-oil export demand contributed positively to output growth both in short-run and long-run. The causality test result found a uni-directional relation from non-oil export to output. The findings support the export-led growth hypothesis.

3. Methodology

This study adopts the Harrod and Domar growth model to investigate the impact of non-oil exports on economic growth in Nigeria. The growth hypothesis assumes that output is a function of capital and labour. The study augments the growth model with non-oil export commodity. We also add government spending and exchange rate as control variables. The model is stated as:

$$Y_t = \beta_0 + \beta_1 CAP_t + \beta_2 LFR_t + \beta_3 NOX_t + \beta_4 GEXP_t + \beta_5 EXR_t + \mu_t \quad (1)$$

Where: *Y* represents real gross domestic product; *CAP* represent stock of capital measured by gross fixed capital formation; *LBR* represents labour force; *NOX* represents non-oil export commodity; *GEXP* represents government expenditure;

EXR represents exchange rate; β_0, β_{1-5} are parameters; *t* represents time; and μ represents error term.

The study expects a direct relationship between non-oil export and output since more exports directly increases income generated from trade. An increase in income of households and firms will encourage more investment and invariably increase more consumption (both private and public). This will thus lead to increase in GDP. The two traditional input factors of growth (capital and labour) have positive association with output. The spending made by government is expected to increase the consumption of economic activities produced by other economic agents, which lead to an increase in investment and overall output growth. Thus, a direct relationship is expected between government expenditure and output. There is also positive relationship between exchange rate and output growth since depreciation of home currency attract foreign investment in capital and labour, which invariably drive output. The competitiveness of a country improves as the value of currency depreciates leading to more exports and economic growth. Mathematically, the relationships presented as:

$$\frac{\partial Y_t}{\partial CAP_t} > 0; \frac{\partial Y_t}{\partial LFR_t} > 0; \frac{\partial Y_t}{\partial NOX_t} > 0; \frac{\partial Y_t}{\partial GEXP_t} > 0; \text{ and}$$

$$\frac{\partial Y_t}{\partial EXR_t} > 0$$

The Vector Error Correction Model (VECM) was employed to analyse the dynamic relationship between non-oil export and economic growth. The stationarity level of our variables at first difference using Augmented Dickey Fuller test and cointegration using Johansen cointegration test were confirmed prior VECM estimation. This method helps to provide both the short-run and long-run estimates and also determines the causation direction between our variables. According to Rahmaddi and Ichihashi (2011), its cointegrating analysis which is a property of long-run equilibrium provides information about the long-run relationship among the variables while the granger causality test indicating the short-run phenomenon provides information on short-run dynamics among the variables (Adesoye, Alimi & Adelowokan, 2016). All the estimated coefficients were evaluated at 5% level of significance. The data are sourced from the Central Bank of Nigeria statistical bulletin, volume 27, 2016 and World development indicator (WDI), 2017 from 1980 to 2016.

4. Empirical Results

4.1. Unit Root Tests

Table 1 presents the stationary test results of the times series variables in the regression equation (1). The Augmented Dickey-Fuller (ADF) unit-root test was used to test the stationarity level of the variables. The test results indicate that all the variables- gross domestic product (Y), capital (CAP), labour force (LFR), non-oil export (NOX), exchange rate (EXR) and government expenditure (GEXP) are not stationary at level but integrated at order one I(1). Therefore, they were found not to reject the null hypothesis of unit root at level but after several iterations based on the number of lag length and differencing, the series were found to reject the null hypothesis at first difference. This implies that the first-difference of the series is mean reverting and stationary.

Table 1. Unit Root Table using ADF

Variables	ADF statistics	Critical Value	p-value	Order of Integration
Y	-5.8774	-4.3750	0.0000	I(1)
CAP	-8.4114	-4.3832	0.0000	I(1)
LFR	-5.1220	-3.6848	0.0010	I(1)
NOX	-6.2886	-4.3750	0.0000	I(1)
GEXP	-8.1484	-4.3750	0.0000	I(1)
EXR	-7.2880	-4.3750	0.0000	I(1)

Source: Authors' computation (2018)

4.2. Cointegration Test

The Johansen (1988) approach of cointegration test was used to find out the existence or inexistence of a long-run relationship among the variables employed for this study and the results are presented in Table 2.

Table 2. Cointegration Test Results

Johansen Cointegration Test
Variables: *Y CAP LFR NOX GEXP EXR*
Lags interval (in first differences): 1 to 2
Trend assumption: Linear deterministic trend

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Max-Eigen Statistics	0.05 Critical Value
None	0.713718	129.5885*	95.75366	45.02801*	40.07757
At most 1	0.614026	84.56046*	69.81889	34.27144*	33.87687
At most 2	0.472232	50.28902*	47.85613	23.00753*	27.58434
At most 3	0.366524	27.28148	29.79707	16.43518	21.13162
At most 4	0.258319	10.84630	15.49471	10.75807	14.26460
At most 5	0.002448	0.088228	3.841466	0.088228	3.841466

Source: Authors' computation (2018)

Note: * indicates 3 cointegrating equations at 5% level and rejection of the hypothesis at 5% level.

The results above indicate three (3) cointegrating equations since the Trace Statistic and Max-Eigen statistics are greater that their respective critical values at 5% significance level. This indicates that there exist three cointegrating vector equations among the considered variables in the order, gross domestic product (Y), capital (CAP), labour force (LFR), non-oil export (NOX), government expenditure (GEXP) and exchange rate (EXR). It implies a long-run relationship between non-oil exports and economic growth in Nigeria during 1980-2016. This calls for estimation of vector error correction model (VECM) which captures both the long-run and short-run information.

4.3. Vector Error Correction Estimates

The short-run and long-run estimates from the VEC model are shown on Table 3. The lag length based on the automatic selection of Schwarz Information Criterion (SIC) was set at two to ensure sufficient degree of freedom. The parameter estimate of the short-run revealed that the first lag of gross domestic product has positive impact on the current level of output in Nigeria but not significant. This result in terms of sign and significance is the same with the coefficients of investment at first lag. However, the current level of output growth reacts positively and statistically significant to changes in the first lag of labour force, non-oil export and government spending. The coefficient of exchange rate was negative and statistically significant at 5% implying that depreciation of currency does not influence change in output positively in the short run. The output growth adjustment rate stood at 19.1% and was found significant at 5% critical level as indicated by the error correction term (ECT) estimates. The ECM value (-0.1907) implied that the model corrects its short-run disequilibrium by 19.1% speed of adjustment in order to return to the long run equilibrium.

Table 3. Result of the Estimated VECM Equation

Dependent Variable: *Y*
Sample: 1980 2016
Included observations: 36

Short-Run Estimates			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**
$\Delta(Y(-1))$	0.4256	0.3230	1.3175
$\Delta(CAP(-1))$	0.3051	0.2321	1.3143
$\Delta(LFR(-1))$	0.8996	0.4282	2.1007**
$\Delta(NOX(-1))$	0.2457	0.0978	2.5124**
$\Delta(GEXP(-1))$	0.5118	0.1957	2.6155***
$\Delta(EXR(-1))$	-0.4073	0.1352	-3.0135***
ECT(-1)	-0.1908	0.0564	-3.3836***

Long-Run Estimates			
CAP	0.0758	0.0713	1.0627
LFR	0.1867	0.0732	2.5485**
NOX	0.0250	0.0134	1.8657*
GEXP	1.2882	0.1307	9.8547***
EXR	-0.4763	0.0601	-7.9316***
Constant	-5.0602	2.7167	-1.8626*
R-squared	0.7829	F-stat	8.1813***
Adj. R-squared	0.5381	S.E. Equ.	0.0192

Source: Authors' computation (2018)

Note: *, ** and *** denote significance level at 10%, 5% and 1%.

The table also reported the long-run estimates of the relationship between non-oil export and output growth. Table 3 showed that non-oil export, capital, labour force and government expenditure have direct impact on output growth in Nigeria. The indicators follow the theoretical expectations. Specifically, a 10% change in non-oil export, capital, labour force and government expenditure will increase the output of the Nigerian economy by 0.25%, 0.76%, 1.87% and 12.8% respectively. The table also revealed that output was indirectly affected by exchange rate with 4.763% due to a 10% change in the later. This does not confirm with a'priori expectations. In terms of partial significance, labour force, government expenditure, and exchange rate have significant coefficients. The parameter of non-oil export was significant at 0.1 critical values. The coefficient of determination denoted by the Adjusted R^2 is moderate with a value of 53.8%. The F-stat value (8.181) shows that the model is well specified and statistically significant.

5. Conclusion

This paper re-examines the growth effects of external sector in Nigeria taking into consideration the role played by non-oil export growth spanning from 1980 to 2016. The findings show that the coefficient of non-oil export was positive and significant at 10% in the long-run, indicating that the contribution of non-oil export commodity on output growth is weak. This is consistence with the findings of Mahdavi and Fatemi (2007). However, the parameter was positive and significant in the short-run at the conventional level. This suggests that government policy should be directed towards increasing non-oil export commodities of agriculture, manufacturing and service industries with the aim of boosting output growth in Nigeria. The environment should be made favourable for local producers and investors to ease production and the distribution channels of goods and services to final consumers. The findings also showed that output growth was directly influenced by investment, labour force and government expenditure while negatively affected by exchange

rate. There is need for government to provide assistance to local industries in form of tax relief, subsidies, and the development of small and medium scale enterprises in order to increase outputs and non-oil commodity exports.

6. References

Abogan, O.; Akinola, E. & Baruwa, O. (2014). Non-oil export and economic growth in Nigeria. *Journal of Research in Economics and International Finance,* 3(1), pp. 1-11.

Abou-Stait, F. (2005). Are exports the engine of economic growth? An application of cointegration and causality analysis for Egypt (1977-2003). *Economic Research Working,* Paper No 76.

Adesoye, A.B.; Adelowokan, A.O. & Alimi, O.Y. (2018). Time series analysis of non-oil export demand and economic performance in Nigeria. *Iranian Economic Review*, 22(1), pp. 295-314.

Adesoye, A.B.; Alimi, O.Y. & Adelowokan, (2016). Fiscal policy, private investment and sustainable development in Nigeria in the 21st century. In "*Environment and Sustainable Development in Nigeria in The 21st Century*", Faculty of Social Science, Obafemi Awolowo University, Ile-Ife, Nigeria National Conference which will held in the University Conference Centre on 28th-29th, March, 2016.

Alimi, O.Y. (2017). Globalization and non-oil export performance in Nigeria: A bound cointegration approach. *EuroEconomica*, 36(2), pp. 44-54.

Alimi, O.Y.; Yinusa, O.G. & Ilo, B.M. (2016). Validity of export-led growth hypothesis for Nigeria: Further evidence. *Yobe Journal of Economics*, 3(1), pp. 127-135.

Awokuse, T.O. (2007). Causality between exports, imports, and economic growth: Evidence from transition economies. *Economics Letters*, 94(3), pp. 389-395.

*** Central Bank of Nigeria (2009). Statistical bulletin, volume 20.

*** Central Bank of Nigeria (2013). Statistical bulletin, volume 24.

*** Central Bank of Nigeria (2016). Statistical bulletin, volume 27.

*** Central Bank of Nigeria and Nigeria Export and Import Bank (1999). A diagnostic study of the Nigerian non-oil export sector: Findings and recommendation. Accessed on 31st January, 2018 from http://library.cbn.gov.ng:8088/cgi-bin/koha/opac-detail.pl?biblionumber=4169&shelfbrowse_itemnumber=6760

Dolado, J.J. & Lutkepohl, H. (1996). Making Wald test work for cointegrated VAR systems. *Econometrics Reviews*, 15, pp. 369-386.

Domar, E.D. (1947). Expansion and employment. *The American Economic Review*, 37(1), pp. 34-55.

Harrod, R.F. (1948). *Towards a dynamic economics, some recent developments of economic theory and their application to policy*. Macmillan, London.

Idowu, K.O. (2005). A preliminary investigation into the causal relationship between exports and economic growth in Nigeria. *CBN Economic and Financial Review*, 43(3), pp. 29-50.

Igwe, A.; Edeh, C.E. & Ukpere, W.I. (2015). Impact of non-oil sector on economic growth: A managerial economic perspective. *Problems and Perspectives in Management*, 13(2), pp. 21-34.

Ijirshar, V.U. (2015). The empirical analysis of agricultural exports and economic growth in Nigeria. *Journal of Development and Agricultural Economics,* 7(3), pp. 113-122.

Laszlo, K. (2007). Exports and growth: Granger causality analysis on OECD countries with a panel data approach. *Economic Modelling*, 23, pp. 978-992.

Mahdavi, A. & Fatemi, M. (2007). An investigation of the impact of non-oil exports on economic growth: Case of Iran. *Iranian Economic Review*, 12(19), pp. 37-59.

Mohsen, A.S. (2015). Effects of oil and non-oil exports on the economic growth of Syria. *Academic Journal of Economic Studies*, 1(2), pp. 69-78.

Nwanchuckwu, P. (2014). The impact of non-oil export strategies on economic growth in Nigeria. *Journal of Economics and Sustainable Development*, 5(24), pp. 21-30.

Okodua, H. & Ewetan, O.O. (2013). Econometric analysis of exports and economic growth in Nigeria. *Journal of Business Management and applied Economics*, *2*(3), pp. 1-14.

Olorunshola, J. (1996). Export-led growth in economic development. *Lessons of Experience Bullion*, 20(4), pp. 51-61.

Peter, O.N. (2002). Restriction economic through privatization. *The Economist*, 4, pp. 32-34.

Pistoresi, B. & Rinaldi, A. (2012). Exports, imports and growth: New evidence on Italy: 1863–2004. *Explorations in Economic History*, *49*(2), pp. 241-254.

Rahmaddi, R. & Ichihashi, M. (2011). Exports and economic growth in Indonesia: A causality approach based on multi-variate error correction model. *Journal of International Development and Cooperation*, 27(2), pp. 53-73.

Solow, R.M. (1957). Technical change and the aggregate production function. *The review of Economics and Statistics*, pp. 312-320.

Toda, H.Y. & Yamamoto, T. (1995). Statistical inference in vector autoregression with possibly integrated processes. *Journal of Econometrics*, 66, pp. 225-250.

World Bank (2013). Africa's Pulse, April 2013: An analysis of issues shaping Africa's economic future. Washington, DC. Access from https://openknowledge.worldbank.org/handle/10986/20238.

World Bank Group (2014). World Development Indicator Database.

World Bank Group (2017). World Development Indicator Database.