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An Impact Analysis of Export-Led Growth Strategy in Nigeria (1980 – 2015)

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Abstract

Prior to the advent of oil in the early 1970's, Nigerian economy had been dependent upon agricultural products including its exports. Oil exploration consequently shifted the economy to oil exports and had widened the scope of the economy with job creation, imports, and growth in the fields of education, health and industrial sectors. However, a fall in the international oil markets globally, consequent upon the emergence of alternative energy sources hampered the growth trends of nations dependent upon oil exports including Nigeria. This study analyses the impact of export-led growth strategy with evidences from Nigeria. A Cobb-Douglass production function was adopted to analyze data sourced from the CBN Annual data 1980-2015 on the relation between GDP and Export products spilled between oil and non-oil exports using Auto Regressive Distributed Lag (ARDL) model. Results of the findings revealed that while the oil exports are directly related to GDP, non-oil exports are not. This suggests that the growth track determined by increase in the GDP is dependent upon oil exports, as non-oil exports contribution is very insignificant. Therefore, the study recommends that other segments of the economy should be diversified to widen the scope of the economy and consequently growth.

Keywords: *Export-Led Growth, Real GDP, Oil Exports, Non-oil Exports, ARDL.*

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Background to the Study

Export-Led Growth Strategy simply refers to a strategy comprising the encouragement and support of production for exports. The rationale lies in the belief by many economists that trade is the engine of growth, as it contributes to efficient allocation of resources within economies and also transmits growth across countries and regions. Some economists such as Omisakin (2009) and Tsen (2006) viewed Export-Led Growth Strategy as a development strategy aimed at growing productive capacity by focusing on international markets. It is also part of consensus opinion among economists such as Tsen (2006) and Omisakin (2009) about the gains from trade by economic openness which became popular from the 1970s, supported by three theoretical arguments. The first is based on Samuelson's (1948) Comparative Advantage Theory, which analyses the benefits from trade between countries with different capital-labour ratios; the second is on the benefits of openness between countries for controlling rent seeking, and the third is concerned with the benefits of openness for growth.

Export-Led Growth Strategy on the other hand is an economic strategy used by some developing countries which seek to find a niche in the world economy for a certain type of export. Industries producing for exports may receive government support and could have better access to the local markets. The strategy also enhances foreign currency inflow and used to facilitate further importation of intermediate goods as well as technology.

In general, Export-Led Growth is important because it creates profit, allows a country to balance its finances, as well as suppressing their debts as long as the facilities and materials for the exports exist. There are two types of exports used in this context: first, what relates with manufactured goods and raw materials. The manufactured goods have to do with the use of manufactured goods as exports in order to achieve Export-Led Growth. Second, where using raw materials as an export serves as another option available to countries. This strategy however, has a considerable amount of risk compared with manufactured goods as exports strategy.

In Nigeria, exports earnings account for 80.0 per cent from oil exports alone, while the non-oil exports account for only about 20.0 per cent on the average between 1980 and 2015 (CBN, 2015). It is against this background that the Structural Adjustment Programme (SAP) was introduced in 1986 as a measure to diversify the Nigerian economy and to revamp the non-oil exports for a sustainable economic growth. Thus, one of the major reasons for adopting SAP was to adjust and correct imbalances for the basic macroeconomic indicators and also to encourage a free market through policies that relied heavily on exports expansion and import substitution approaches for industrialization. The study will apply Auto Regressive Distributed Lag (ARDL) Approach on a modified Cobb-Douglas production function.

Objectives of the Study

The broad objective of this study is an Analysis of the impact of Export-Led Growth Strategy in Nigeria. The specific objectives include:

i. To determine which component of exports (oil or non-oil) have significant impact on economic growth in Nigeria?

ii. To proffer suggestions and recommendations for economic diversification or growth via trade or export expansion.

Hypotheses

The following Alternative hypotheses are formulated to guide this study.

Ho_1: Export-Led Growth Strategy doesn't exert any significant impact on the level of economic growth in Nigeria.

Ho2: Both oil and a non-oil export doesn't have significant impact on economic growth in Nigeria.

Theoretical Framework and Empirical Review of Literature

Keynesian Growth Theory

The Keynesian growth theory emerged in the 20^{th} century after the publication of the Keynes (1936) 'General Theory' with early major contributions including those of Harrod (1939), Kahn (1959), and Robinson (1962). However, it is not quite accurate to say that it emerged new, out of nowhere or indeed, that it ever really emerged. The theory was anticipated in the writings of earlier economists including most notably, Malthus (1933) and Marx (1970) who recognized that there could be general overproduction and deficient aggregate demand. However, the theory was improved with the emergence of Keynes (Eltis, 2001).

The Keynesian growth theory relies on spending and aggregate demand to define the economic marketplace. Keynesian economists believed that the aggregate demand is often influenced by public and private decisions. Public decisions represent government agencies and municipalities. Private decisions include individuals and businesses in the economic marketplace. It also dictates that government spending can improve or take the place of economic growth in the absence of consumer spending or business investment (Eltis, 2001).

Monetarist Growth Theory

Monetarists are group of economists largely concerned with money and its effects. The most famous monetarist is Milton Friedman (1968) who developed much of the monetarist theories we learn today. Monetarism is very closely allied with the classical school of thought, it is essentially an extension of classical theory which was developed in the 1960s and 1970s to try and explain the new economic phenomenum. The monetarist's assumptions revolved around the role of expectations in determining export-led growth hypothesis, and a key part of their theory was the development of the Expectations-Augmented Phillips Curve (Meltzer, 1975).

Therefore, Monetarism is a macroeconomic school of thought that emphasizes long-run monetary neutrality, short-run monetary non-neutrality and the distinction between real and nominal interest rate as well as the role of monetary aggregates in policy analysis. It is particularly associated with the writings of Anna Schwartz (1963) Milton Friedman (1968), Karl Brunner (1968) and Allan Meltzer (1975).

Review of Empirical Literature

Konya (2004) used annual data from 1980 to 2004 to test the possibility of export-led growth and growth driven export in Japan. He applied Granger causality of real exports and real GDP. The results indicated that growth causes exports. He concluded that there is no causal relationship between real exports and real GDP.

Palley (2003) used annual data from 1980 to 2003 to test the export-led growth model for United States of America (USA). He applied vector error correction models (VECM). Results Indicated that there is significant cross-country crowding out, with exports to the U.S from the four East Asian tiger economies namely, Taiwan, South Korea, Hong Kong and Singapore.

Paula, Ana and Vitor (2013) used annual data from 1995 to 2010 to test the Export-Led Growth Strategy for 23 European countries. They applied augmented Solow-decomposition growth model in order to investigate the relationship between exports and real income per capita growth. Their findings revealed that economic growth is fostered through export specialization in high value-added products such as manufactures and high technology products. They also found that higher growth is fostered by export diversification across partners, while enlarging the portfolio of partners, mainly to less developed and more distant countries, has negative impacts on European growth. They concluded that relative concentration of exports should be directed towards higher growth countries.

Didenkoa, Kunzeb and Skipnuk (2015) used annual data covering GINI index, and production, exports and prices of oil from 1990 to 2012 to examine the causal relationship between export and GDP of Russian Federation. The results show that the export of raw materials can significantly improve the development of the Russian social sector under the condition of the growing demand of energy resources. The result suggests that the country with the vast oil and gas reserve should target the policy of restricting the exports and stimulating its consumption within the economy.

Emerging Market Economies

Dilek and Aytac (2010) used annual data to test the Export-Led Growth Hypothesis for Turkey from 1950 to 2009. They applied econometric techniques in the form of Johansen co-integration test, vector error correlation model and Granger causality tests. The Johansen co-integration test confirms the existence of the long-run relationship among the two variables. The Granger causality test shows one way causality from economic growth to real net exports. The causality results are consistent with the results reported by the Vector Error Correction Model.

Saleh and Natalia (2010) used annual data from 1998 to 2008 to test the Export-Led Growth Strategy for India. They applied Johansen methodology on an augmented Cobb-Douglas production function. The results support the validity for the study period but the magnitude of the impact is small. They therefore concluded that even in large emerging economies with strong absorptive capacity and significant catch-up potentials, learning-by-exporting effects may be non-existent. Rather, self-selection of more productive firms into exporting explains the productivity differential between exporters and non-exporters.

Pakasa and Mardiana (2012) used annual data to test the Export-Led Growth Hypothesis in Indonesia from 1980 to 2010. They used vector auto regression model to assess whether the economic growth in Indonesia is export-led. Results of their study suggest that Indonesian economic growth has been stimulated by export performance. They concluded that exports play a significant role in effecting variation in domestic demand, and thus suggests the importance for Indonesia to be more competitive in international trade in order to maintain economic growth.

Denu (2015) used annual time series data from 1960 to 2010 to test the Export-Led Growth Hypothesis for South Korea. He applied Cobb-Douglas production function under the VectoAutoregressive (VAR) model and Granger causality test. Results indicated that a unidirectional long-run causality exists between exports and economic growth in South Korea. The study also examined the connection between trade and economic growth, where trade has been an important sector of the economy. The study similarly, revealed that a unidirectional causality running from exports to economic growth in Korea.

Experience from Developing Countries

Wong, (2007) examined the Export-Led Growth Hypothesis for Saudi Arabia from 1980 to 2004. He applied Granger causality test. He found out that exports, consumption and investment are important to economic growth and also economic growth is important to exports, consumption and investment. The study concluded that consumption is more important than investment in contributing to economic growth.

Sharma and Smyth, (2005) examined the Export-Led Growth Hypothesis for Guinea Bissau from 1982 to 2004. They applied panel co-integration and panel Granger causality approaches. Results suggested that the poor growth performance reflected the poor export performance. They concluded that if the supply side constraints on exports are removed, there could be a vicious cycle between economic growth and exports.

Aidil, Roselee and Mohd (2005) used annual data to test the Export-Led Growth Strategy in Malaysia from 1988 to 2004. They applied Granger causality test and Vector error Correlation model. They found that export-led growth hypothesis for the period of the study was rejected. Therefore, they concluded that growth for the period of study is caused by domestic market and not from foreign sector. This result challenges the superiority of outward oriented kind of policy for economic growth, i.e export-led policy.

Hermann, (2005) used annual data covering real domestic product (GDP), real gross fixed capital formation, labor and real exports to test the validity of Export-Led Growth Hypothesis for Honduras, El Salvador and Costa Rica from 1970 to 2000. He applied Cobb-Douglas production function and formulated dynamic econometric model. Results implied that efforts being put forth by the government to promote total agricultural exports are not sufficiently strong enough to lead to economic growth over the study period. The study concluded that the long-run relationship between the variables do not conform to economic theory.

Ramona. (2006) used annual data covering GDP and exports to test the validity of Exports-Led Growth Strategy for nine Southern African Countries from 1980 to 2002. He applied co-integration and Granger causality tests. The study concluded that the direction of causation between GDP and exports were tested using a system of equations, thereby implying that expanding exports can contribute to economic growth, poverty reduction and job creation in all the countries.

Experience in Nigeria

Yaru (2008) used annual data covering GDP growth rate, oil and non-oil exports from 1970 to 2006 to test the Export-Led Growth Hypothesis for Nigeria. He applied the non-structural vector autoregressive modeling approach (VAR) to estimate the empirical relationship between export and economic growth in Nigeria for the study period. The findings of the study revealed that exports (oil and non-oil) have a significant but opposite dynamic impacts on Nigeria's economic growth. While the short and long run impact of oil exports was negative, and that of non-oil exports was positive. He therefore concluded that Nigeria can enhance her growth through the growth of non-oil exports and the test of export-led growth hypothesis should be conducted using disaggregated data. He recommended among others the promotion of non-oil exports.

Alimi and Muse, (2012) used annual data covering total export, oil export and non-oil export from 1970 to 2009 to test the Export-Led Growth strategy in Nigeria. They applied unit root test, co-integration analysis and VAR Granger causality/Exogeneity world test. The results showed that both economic growth and exports are co-integrated, indicating an existence of a long-run equilibrium relationship. The result also showed that there is evidence of uni-directional causality between export and economic growth in Nigeria. However, they concluded that the study provided support for growth-led export, thus efforts should be directed towards policies that will enhance economic growth such as import substitution strategy in order to create more impact on exports.

Okafor, Victor and Ann (2013) used annual data covering oil; manufacturing and agricultural shares of total exports and per capita income to test the export-led growth strategy for Nigeria from 1981 to 2012. They applied the Johansen co-integration test and used Granger causality test to confirm the direction of the relationships. The results showed that there is a long-run relationship between the variables. They therefore suggested that Government should promote efficiency in the allocation of developmental resources to the agricultural sector through provisions of funds and other infrastructural facilities.

Abogan, Akinola and Baruwa (2014) used annual data from 1980 to 2010 to test the Export-Led Growth Strategy for Nigeria. They applied Ordinary least square methods involving Error correlation mechanism. The study concluded that government needs to diversify the economy so that non-oil exports revenue could be increased.

Research Methodology

Types and Sources of Data

The study uses mainly secondary data obtained from the Statistics Data Base and Statistical Bulletin of the Central Bank of Nigeria (CBN), and the Annual Abstract of the National Bureau of Statistics (NBS) (2015). The time series data to be used for the estimation is on Annual basis. The definition of each of the variables used for the study follows the metadata of the institution where the data is obtained.

Variables Description and Transformation

The description or definition of the variables to be used for the estimation, and in line with the metadata of the respective institutions where the data there are derived in detail in-turn as follows:

Real Growth Domestic Product: Following the work of Ari (2002), Bernand (2004), Andre and Joel (2007) and Donya (2015) among many others, real GDP is included in the study as a dependent variable. For the purpose of this study, real GDP will be denoted as *y*. In line with the National Bureau of Statistics computational procedure, real GDP is given as:

$$y_t = \frac{C_t + I_t + G_t + (X_t - M_t)}{CPI_t} \qquad (3.1)$$

Where *y* represents real gross product, *C* is consumption expenditure, *I* stands for private domestic investment, *G* denotes government consumption expenditure, *X* proxies exports, *M* is imports, *CPI* stands for consumer price index and subscript *t* is the time dimension.

Exports: This variable represented as *X* in the estimated equations is the total monetary value of goods and services exported to the rest of world, from Nigeria over a given period of time.

However, given the peculiarity of Nigerian economy as a mono product economy which depends largely on oil as major source of exports, this study further disaggregated exports into oil and non-oil exports. The disaggregation is a wide departure from other studies conducted earlier in this research area. In the estimation models, oil exports will be denoted as *ox* and non-oil exports as *nox*. Both *ox* and *nox* will be used in their real terms.

Estimation Technique

Following both the theoretical and empirical reviews, the study will determine the long-run relationship between real GDP and both components of exports. If long-run relationships are determined among the variables and error correction equation will be modeled to determine a short-run dynamics of the long-run equation.

However, prior to running the long-run equation, graphical representation of the variables used in the model is carried-out in order to determine the characteristics of the series. Thereafter, a unit root test will be conducted on the variables to determine their level of stationarity, since Autoregressive Distributed Lag (ARDL) Model is non-accommodative of I(2) series. In the same vein, summary statistics as well as correlation coefficient among the variables used in the study is pre-determined the existence of serial correlation and heteroskedasticity among the variables.

The best line model for the long-run equation is formulated as:

$$y_t = ox_t + nox_t + \mu_t \qquad (3.2)$$

Where y is real gross domestic product, ox is oil exports, nox is non-oil exports, μ represents error term and the subscript t connotes time.

Co-integration Test

The study adopted Autoregressive Distributed Lag Approach (ARDL) otherwise refers to as bounds test approach to co-integration developed by (Pesaran, Shin and Smith 2001). The choice of ARDL is determined by many considerations, prominent among which are: first, it can be used irrespective of whether the regressors are I(1) or I(0) or a mixture of both (Pesaran, Shin and Smith 2001). Second, it is tolerant to small sample. In other words, it yields robust results even if the sample size is small. Third, it yields un-biased estimate of the long-run model and the valid t statistics even when some of the regressors are endogenous (Harris and Sollis, 2003).

Following Pesaran, Shin and Smith, (2001), the ARDL format of equation (2.2) takes the form:

$$\Delta Ly_t = \alpha + \sum_{i=1}^{m} \beta_{i,1}\Delta Ly_{t-i} + \sum_{i=0}^{n} \beta_{i,2}\Delta Lox_{t-i} + \sum_{i=0}^{o} \beta_{i,3}\Delta Lnox_{t-i} + \gamma_1 Ly_{t-1} + \gamma_2 Lox_{t-1} + \gamma_3 Lnox_{t-1} + \mu_t \qquad (3.3)$$

Where y represents real GDP, ox is real oil exports, nox stands for real non-oil exports, L is natural logarithm, is first difference operator, $\beta_{i,s}$ are coefficients of their respective short-run parameters, γs are coefficients of the long-run parameters, μ denotes error term and the subscript t is the time dimension.

Following Granger representation theorem, any model that is co-integrated must have the short-run dynamics which will show the possibility of the restoration of equilibrium in case of distortion. The short-run dynamics otherwise known as the error correction model also enables the determination of the pace of the re-establishment of equilibrium. Hence, the error correction format of equation (3.3) is formulated as:

$$\Delta Ly_t = \alpha + \sum_{i=1}^{m} \beta_{i,1}\Delta Ly_{t-i} + \sum_{i=0}^{n} \beta_{i,2}\Delta Lox_{t-i} + \sum_{i=0}^{o} \beta_{i,3}\Delta Lnox_{t-i} + ECM_{t-1} \quad (3.4)$$

Where ECM is the error correction version of the ARDL model and all other variables are as explained under equation (3.3).

The study after carrying out the short-run dynamics, the stability of the model and of the estimated parameters are determined using cumulative sum (CUSUM) of the residual errors and cumulative sum of squares (CUSUMSQ) of the residual errors. If the CUSUM and CUSUMSQ fall within 5.0 per cent critical values, the model as well as the estimated parameters are adjudged to be stable, if not, the model is said to be either unstable or contain a structural break.

In the short-run environment Granger causality is carried out to determine the validity of the Export-Led Growth Strategy. In other words, Granger causality is conducted to determine if it is growth (real GDP) that granger causes real exports or it is real exports that granger causes real GDP. If real export is responsible for granger causing GDP, a conclusion is drawn that real GDP, all things being equal, is a function of real exports, hence Export-Led Growth Hypothesis holds for Nigeria. The reverse is also true. Granger causality also helps in determining which component of exports (oil or non-oil) is far more responsible for granger causing real GDP.

At the end of both long and short-run analyses, autocorrelation and heteroskedasticity tests will be conducted to determine their presence in the estimated models so as to avoid spurious regression results.

Data Presentation, Analysis and Results Interpretation Summary Statistics
Table 1: Summary Statistics

	LY	LNOX	LOX
Mean	7.985	3.102	6.421
Median	8.340	3.212	7.100
Maximum	11.453	7.030	9.570
Minimum	4.547	-1.594	1.974
Std. Dev.	2.213	2.733	2.672
Skewness	-0.205	-0.147	-0.418
Kurtosis	1.705	1.872	1.753
Jarque-Bera	2.690	1.982	3.286
Probability	0.261	0.371	0.193
Sum	279.479	108.581	224.751
Sum Sq. Dev.	166.580	253.966	242.816
Observations	35	35	35

Source: Computed by Author using Eviews 9

Table 4.1 reports the summary statistics of the variables used for the estimation. Visual analysis of Table 4.1 shows that there are 56 observations per variable. The mean, median, maximum and minimum observations for national output (LY) are 7.985, 8.340, 11.453 and 4.547, respectively. In the same vein, the nonoil exports (LNOX), within the study periods returns 3.102, 3.212, 7.030 and -1.594 as the mean, median, maximum and minimum observations respectively. The results shows that the log of oil exports (LOX) yields a mean, median, maximum and minimum observations of 6.421, 7.100, 9.570 and 1.753 respectively. The skewness of LY, LNOX and LOX were -0.205, -0.147 and -0.418, implying that while national output and nonoil exports were all negatively skewed, and also oil exports is negatively skewed. The minimum observation of 1.974 and the maximum of 11.453 shows that the distribution, although not explosive but asymmetrical.

Unit Root Test
Table 2: Unit Root Test

	ADF - AIC		Phillip-Perron	
	Level	**First Diff.**	**Level**	**First Diff.**
LY	-1.910718	-4.438948*	-1.938227	5.874999*
LNOX	-3.973031**	-7.14868*	-3.264932**	-15.2047*
LOX	-1.457936	4.222721**	-1.443611	-7.585686*

Source: Computed by Author using Eviews 9

The results of the unit root test conducted on the variables used for the estimations are reported in Table 4.2 It is clear from Table 4.2 that all the variables are first differentiated stationary based on both Augmented Dickey-Fuller (ADF) considering Akaike Information Criterion (AIC) and Phillips-Perron (PP). In other words both Augmented Dickey-Fuller based on Akaike Information Criterion reported the series as I (1) at 1.0 percent significance level. This provides further supports to the use of autoregressive distributed lag as the series does not contain I (2) variables.

Short Run Dynamics (Error Correction Model)
Table 3: Short Run Dynamics (Error Correction Model) - ARDL(1,0,4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ(LOX)	0.260	0.079	3.272	0.003
Δ(LNOX)	0.026	0.073	0.361	0.722
ΔLNOX(-1)	-0.066	0.076	-0.872	0.392
ΔLNOX(-2)	-0.146	0.077	-1.902	0.070
ΔLNOX(-3)	-0.192	0.076	-2.524	0.019
ECM(-1)	-0.442	0.091	-4.869	0.000

R^2 = 0.99; AIC = -0.448, SBC = -0.078, HQC = -0.328; DW = 1.881

Adj. R^2 = 0.99; F-Stats = 549.736, P(F-Stats) = 0.000

Source: Computed by Author using Eviews 9

The short-run dynamics which is otherwise known as the error correction model was carried out after the retrieval of the long run coefficient. The error correction model shows the possibility of the restoration of the equilibrium in case of distortion in the economy. It also collaborates the cointegration as derived by the conduct of world test. The result of the short run dynamics is presented in Table 4.3. The lag 1 coefficient of the error correction term yield a negative sign (-0.120) and statistically significant at 1.0 percent. This implies that, in case of distortion in the economy, equilibrium can be re-established by 12.0 percent growth rate annually. Theoretically the 12.0 percent annual adjustment towards equilibrium signifies a slow adjustment process, as it will take the economy about 8 years and 3 months to revert to the status quo.

Out of the 2 parameters (ie oil and nonoil exports) only oil exports, as in the case of the long run positively influence the level of economic activities. A 1.0 percentage point change in oil exports will lead to approximately 2.6 percentage point rise in the level of economic activities in Nigeria and the reverse is also through. This direct relationship between oil exports and the level of economic activities in the short run is consistent with the long run result as reported in Table 4.4. The only difference between the coefficient of oil exports in the short and long run is the magnitude but the signs are the same. The magnitude of the coefficient of oil exports in the long run is by far larger than that of the short run. The result as obtained by both the short and long run are not only in line with economic theory but consistent with the peculiarity of the Nigerian economy. Nigeria is adjudged to be the 7th largest producer of oil in Organization of Petroleum Exporting countries (OPEC) and 9th in the world. Most importantly, oil is the major source of foreign exchange earnings and has a lion share of exports. It is also the main stay of the Nigerian economy.

Post Estimation Diagnostics Tests

Table 4: Post Estimation Diagnostics Tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.137	Prob. F(2,21)	0.340
Obs*R-squared	3.030	Prob. Chi-Square(2)	0.220

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.104	Prob. F(7,23)	0.394
Obs*R-squared	7.797	Prob. Chi-Square(7)	0.351
Scaled explained SS	8.748	Prob. Chi-Square(7)	0.271

Source: Computed by Author using Eviews 9

To avoid the possibility of interpreting a superior results and making inference there from for policy recommendation, a comprehensive post estimation diagnostic test was carried out. The result of Breuusch-Grodfrey serial correlation LM Test and Breusch-Pagan-

Godfrey Heteroskedasticity test were reported as Table 4.4. For the serial correlation LM test, the insignificant P values of 0.340 and 0.220 for F-statistic and obs*R-squared shows that there is no evidence of serial correlation. Similarly, the P values of F-statistic, obs*R-squared and scaled explained SS stand at 0.394, 0.351 and 0.271 respectively, implying lack of evidence of Heteroskedasticity.

Figure 4.1: Cumulative Sum of Residual Test

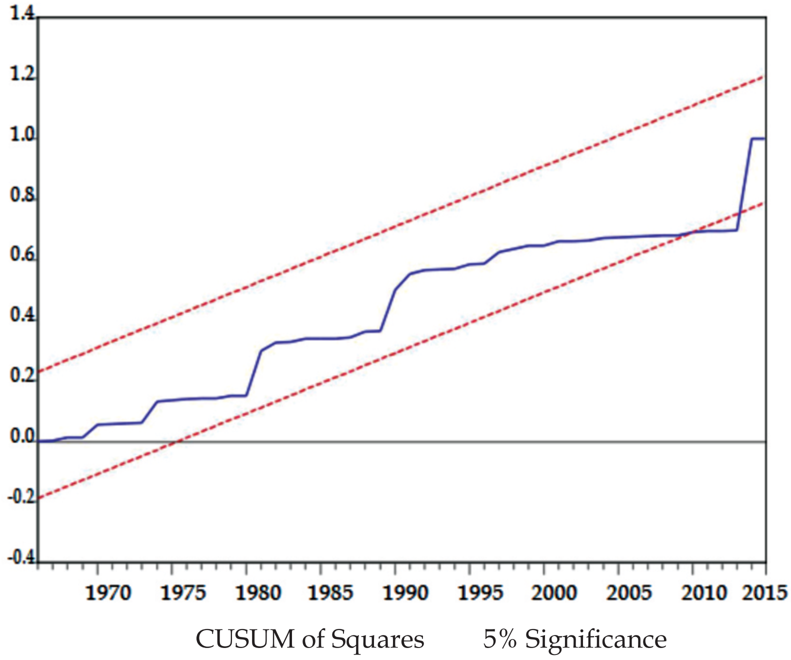

Figure 4.1 shows that the model and the estimated parameters are largely stable but not throughout the study period. Close examination of the figure reveals that the chart veers outside the critical line of 0.05 between 2012 and 2013, although the break did not persist.

Summary of Findings

Results of both the estimated long and short run models as well as the Granger causality test yield some interesting findings. Prominent among these findings can be summarized as follows:

i. Whereas oil exports are directly related to GDP, non-oil exports are not. This implies that non-oil export does not remarkably impact on GDP. This is in tune with reality as non-oil exports is an insignificant component of the total export. In other words, oil export is the major component of Nigeria's total export.

ii. There is a long run relationship between GDP and both components of exports (oil and nonoil). Put differently, co integration exists among GDP, oil and non-oil exports, such that movement in either the oil and nonoil component of exports can be used to determine the possible direction of GDP.

iii. In case of distortion in the economy, equilibrium can be restored at 12 per cent per annum.

iv. Finally, neither oil nor non-oil export shows a causal relationship with GDP.

Summary

The study analyzed the Impact of Export-Led Growth Strategy for Nigeria between 1960 and 2015 using Autoregressive Distributed Lag Approach. The study significantly departs from other studies conducted on the same topic as it disaggregates exports into oil and non-oil components respectively.

The results did not provide sufficient evidence in support of Export-Led Growth Strategy for Nigeria within the studies period, although the long-run relationship (cointegration) seems to exist between output (GDP) and both components of exports.

The coefficient of oil exports is directly and significantly related to output while non-oil export which yields a negative coefficient and is statistically insignificant.

The long run result is replicated in the short-run. However, the magnitude of the positive and statistically significant coefficient of oil exports in the short run is less than in the long run.

Conclusion

Following the findings of the study, it can be concluded that Export-Led Growth Strategy is not valid for Nigeria during the study period. This notwithstanding, however, there is cointegrating relationship between GDP and both component of exports. While non-oil exports impacts significantly on output in both the long and short run while oil exports does not. Therefore, we conclude the following:

a) The study also revealed that Export-Led Growth Strategy holds for Nigeria, but there is need for government at all levels to give more emphasis to the nonoil sector in order to diversify the economy.

b) The study also found that oil export dominated the economic growth track in the country, which contributed about 80.0 per cent of the nation's GDP, but the nonoil sector which account for only 20.0 per cent which had also hindered diversification and economic growth strategies in the country.

Recommendations

In line with results of the estimated equations, the following recommendations are proffered which if properly implemented are expected to boost exports and GDP relationship.

Based on these findings the following recommendations are proffered:

a) The exports base should be diversified in favour of nonoil commodities, not only to increase their contribution to GDP but also to help cushion the effect of price shocks in the international crude oil markets.

b) Oil explorers, producers and exporters should be persuaded to diversify their interests into nonoil commodities as well or they could be obligated to somehow assist with the exports of nonoil commodities.

c) Promotion of a stable political and macroeconomic environment that encourage exportation, particularly of nonoil commodities.

d) Incentives provision attached to non-oil exports should be reviewed and improved as well as to be strictly implemented.

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Appendices

Summary Statistics

	LY	LNOX	LOX
Mean	7.985127	3.102320	6.421455
Median	8.340277	3.211767	7.100439
Maximum	11.45259	7.030124	9.569633
Minimum	4.546746	-1.593565	1.974248
Std. Dev.	2.213464	2.733054	2.672387
Skewness	-0.204863	-0.147461	-0.417786
Kurtosis	1.705255	1.872048	1.752980
Jarque-Bera	2.689516	1.982248	3.285974
Probability	0.260603	0.371159	0.193402
Sum	279.4794	108.5812	224.7509
Sum Sq. Dev.	166.5803	253.9658	242.8161
Observations	35	35	35

Correlation Coefficient

	LY	LNOX	LOX
LY	1	0.98279615208 92631	0.98843217548 50885
LNO X	0.98279615208 92631	1	0.97801306447 66234
LOX	0.98843217548 50885	0.97801306447 66234	1

Unit root Test

Null Hypothesis: LY has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.910718	0.6271
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LY)
Method: Least Squares
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LY(-1)	-0.208849	0.109304	-1.910718	0.0653
C	1.061745	0.456026	2.328254	0.0266
@TREND("1981")	0.045015	0.023727	1.897190	0.0672

R-squared	0.105414	Mean dependent var	0.203113
Adjusted R-squared	0.047699	S.D. dependent var	0.201132
S.E. of regression	0.196277	Akaike info criterion	-0.334485
Sum squared resid	1.194261	Schwarz criterion	-0.199807
Log likelihood	8.686253	Hannan-Quinn criter.	-0.288556
F-statistic	1.826449	Durbin-Watson stat	1.905304
Prob(F-statistic)	0.177887		

Null Hypothesis: D(LY) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.438948	0.0067
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

Dependent Variable: D(LY,2)
Method: Least Squares
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LY(-1))	-1.252044	0.282059	-4.438948	0.0001
D(LY(-1),2)	0.171922	0.211359	0.813413	0.4228
C	0.292806	0.104423	2.804026	0.0091
@TREND("1981")	-0.001731	0.004083	-0.423945	0.6748

R-squared	0.551109	Mean dependent var	-0.000941
Adjusted R-squared	0.503013	S.D. dependent var	0.300658
S.E. of regression	0.211956	Akaike info criterion	-0.148408
Sum squared resid	1.257909	Schwarz criterion	0.034809
Log likelihood	6.374533	Hannan-Quinn criter.	-0.087677
F-statistic	11.45863	Durbin-Watson stat	2.013970
Prob(F-statistic)	0.000045		

Null Hypothesis: LY has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.938227	0.6128
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.035125
HAC corrected variance (Bartlett kernel)	0.036313

Phillips-Perron Test Equation
Dependent Variable: D(LY)
Method: Least Squares

Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LY(-1)	-0.208849	0.109304	-1.910718	0.0653
C	1.061745	0.456026	2.328254	0.0266
@TREND("1981")	0.045015	0.023727	1.897190	0.0672

R-squared	0.105414	Mean dependent var	0.203113
Adjusted R-squared	0.047699	S.D. dependent var	0.201132
S.E. of regression	0.196277	Akaike info criterion	-0.334485
Sum squared resid	1.194261	Schwarz criterion	-0.199807
Log likelihood	8.686253	Hannan-Quinn criter.	-0.288556
F-statistic	1.826449	Durbin-Watson stat	1.905304
Prob(F-statistic)	0.177887		

Null Hypothesis: D(LY) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.874999	0.0002
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.039689
HAC corrected variance (Bartlett kernel)	0.032073

Phillips-Perron Test Equation
Dependent Variable: D(LY,2)
Method: Least Squares

Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LY(-1))	-1.064938	0.182586	-5.832527	0.0000
C	0.230201	0.085130	2.704131	0.0112
@TREND("1981")	-0.000529	0.003824	-0.138428	0.8908

R-squared	0.532669	Mean dependent var	-0.000387
Adjusted R-squared	0.501514	S.D. dependent var	0.295940
S.E. of regression	0.208944	Akaike info criterion	-0.206990
Sum squared resid	1.309732	Schwarz criterion	-0.070944
Log likelihood	6.415329	Hannan-Quinn criter.	-0.161214
F-statistic	17.09718	Durbin-Watson stat	2.024531
Prob(F-statistic)	0.000011		

Null Hypothesis: LNOX has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.973031	0.0201
Test critical values:	1% level	-4.273277	
	5% level	-3.557759	
	10% level	-3.212361	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNOX)
Method: Least Squares
Sample (adjusted): 1984 2015
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNOX(-1)	-0.860755	0.216649	-3.973031	0.0005
D(LNOX(-1))	0.326492	0.201676	1.618898	0.1171
D(LNOX(-2))	0.461627	0.170234	2.711715	0.0115
C	-1.295668	0.460363	-2.814448	0.0090
@TREND("1981")	0.224454	0.058835	3.814965	0.0007

R-squared	0.420245	Mean dependent var	0.252969
Adjusted R-squared	0.334355	S.D. dependent var	0.445267
S.E. of regression	0.363280	Akaike info criterion	0.955317
Sum squared resid	3.563260	Schwarz criterion	1.184338
Log likelihood	-10.28507	Hannan-Quinn criter.	1.031231
F-statistic	4.892842	Durbin-Watson stat	1.982637
Prob(F-statistic)	0.004248		

Null Hypothesis: D(LNOX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.148680	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNOX,2)
Method: Least Squares
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNOX(-1))	-1.207837	0.168959	-7.148680	0.0000
C	0.428710	0.168772	2.540178	0.0165
@TREND("1981")	-0.006751	0.008005	-0.843421	0.4057

R-squared	0.632194	Mean dependent var	0.016913
Adjusted R-squared	0.607673	S.D. dependent var	0.698841
S.E. of regression	0.437726	Akaike info criterion	1.272060
Sum squared resid	5.748116	Schwarz criterion	1.408106
Log likelihood	-17.98899	Hannan-Quinn criter.	1.317835
F-statistic	25.78235	Durbin-Watson stat	1.977705
Prob(F-statistic)	0.000000		

Null Hypothesis: LNOX has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.264932	0.0893
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.147060
HAC corrected variance (Bartlett kernel)	0.144062

Phillips-Perron Test Equation
Dependent Variable: D(LNOX)
Method: Least Squares
Sample (adjusted): 1982 2015
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNOX(-1)	-0.551445	0.167765	-3.287001	0.0025
C	-0.658269	0.315539	-2.086178	0.0453

@TREND("1981")	0.145246	0.045353	3.202587	0.0031

R-squared	0.259933	Mean dependent var	0.234293
Adjusted R-squared	0.212187	S.D. dependent var	0.452475
S.E. of regression	0.401612	Akaike info criterion	1.097434
Sum squared resid	5.000047	Schwarz criterion	1.232113
Log likelihood	-15.65639	Hannan-Quinn criter.	1.143364
F-statistic	5.444056	Durbin-Watson stat	1.749876
Prob(F-statistic)	0.009412		

Null Hypothesis: D(LNOX) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 21 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-15.20470	0.0000
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.174185
HAC corrected variance (Bartlett kernel)	0.017000

Phillips-Perron Test Equation
Dependent Variable: D(LNOX,2)
Method: Least Squares

Sample (adjusted): 1983 2015
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNOX(-1))	-1.207837	0.168959	-7.148680	0.0000
C	0.428710	0.168772	2.540178	0.0165
@TREND("1981")	-0.006751	0.008005	-0.843421	0.4057

R-squared	0.632194	Mean dependent var	0.016913
Adjusted R-squared	0.607673	S.D. dependent var	0.698841
S.E. of regression	0.437726	Akaike info criterion	1.272060
Sum squared resid	5.748116	Schwarz criterion	1.408106
Log likelihood	-17.98899	Hannan-Quinn criter.	1.317835
F-statistic	25.78235	Durbin-Watson stat	1.977705
Prob(F-statistic)	0.000000		

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOX)
Method: Least Squares
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOX(-1)	-0.180321	0.123682	-1.457936	0.1549
C	0.620217	0.262592	2.361909	0.0246
@TREND("1981")	0.041790	0.033003	1.266240	0.2149

R-squared	0.078517	Mean dependent var	0.209986
Adjusted R-squared	0.019066	S.D. dependent var	0.415666
S.E. of regression	0.411685	Akaike info criterion	1.146980
Sum squared resid	5.254014	Schwarz criterion	1.281658
Log likelihood	-16.49865	Hannan-Quinn criter.	1.192909
F-statistic	1.320707	Durbin-Watson stat	1.959857
Prob(F-statistic)	0.281550		

Null Hypothesis: D(LOX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on AIC, maxlag=8)

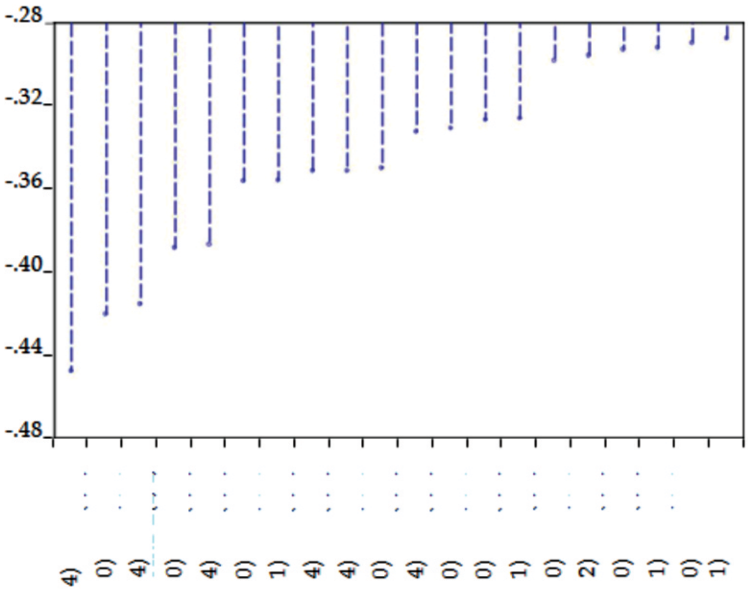
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.222721	0.0116
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOX,2)
Method: Least Squares
Sample (adjusted): 1985 2015
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOX(-1))	-1.612215	0.381795	-4.222721	0.0003
D(LOX(-1),2)	0.315216	0.283439	1.112111	0.2763
D(LOX(-2),2)	0.072481	0.180161	0.402313	0.6907
C	0.723841	0.225222	3.213896	0.0035
@TREND("1981")	-0.017947	0.008748	-2.051427	0.0504

R-squared	0.643211	Mean dependent var	-0.002916
Adjusted R-squared	0.588320	S.D. dependent var	0.639332
S.E. of regression	0.410210	Akaike info criterion	1.202395
Sum squared resid	4.375078	Schwarz criterion	1.433683
Log likelihood	-13.63712	Hannan-Quinn criter.	1.277789
F-statistic	11.71805	Durbin-Watson stat	2.065684
Prob(F-statistic)	0.000014		

Akaike Information Criteria (top 20 models)



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.137382	Prob. F(2,21)	0.3396
Obs*R-squared	3.029792	Prob. Chi-Square(2)	0.2198

Test Equation:
Dependent Variable: RESID
Method: ARDL

Sample: 1985 2015
Included observations: 31
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LY(-1)	0.061971	0.148027	0.418645	0.6797
LOX	0.012519	0.073913	0.169379	0.8671
LNOX	-0.003717	0.088963	-0.041778	0.9671
LNOX(-1)	-0.040696	0.105538	-0.385600	0.7037
LNOX(-2)	0.022838	0.095258	0.239745	0.8129
LNOX(-3)	-0.011340	0.096371	-0.117672	0.9074
LNOX(-4)	-0.034814	0.084435	-0.412317	0.6843
C	-0.400639	0.739721	-0.541608	0.5938
RESID(-1)	-0.038783	0.255406	-0.151848	0.8808
RESID(-2)	-0.472630	0.318783	-1.482607	0.1530

R-squared	0.097735	Mean dependent var	1.35E-16
Adjusted R-squared	-0.288950	S.D. dependent var	0.151873
S.E. of regression	0.172424	Akaike info criterion	-0.422025
Sum squared resid	0.624330	Schwarz criterion	0.040552
Log likelihood	16.54138	Hannan-Quinn criter.	-0.271236
F-statistic	0.252752	Durbin-Watson stat	2.032595
Prob(F-statistic)	0.980800		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

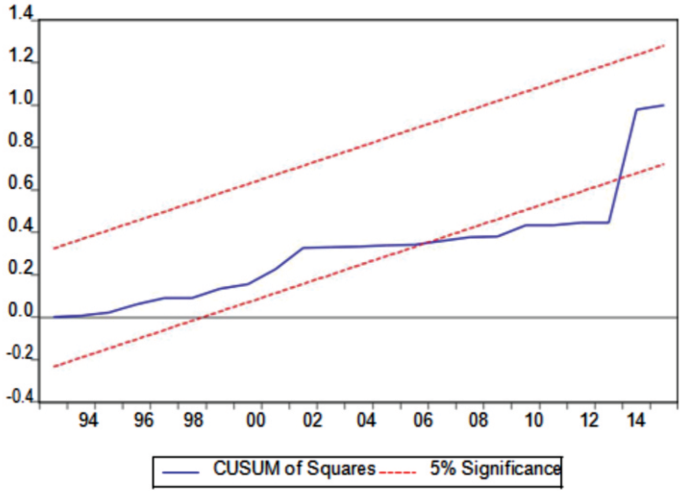
F-statistic	1.104051	Prob. F(7,23)	0.3935
Obs*R-squared	7.796674	Prob. Chi-Square(7)	0.3509
Scaled explained SS	8.748095	Prob. Chi-Square(7)	0.2713

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Sample: 1985 2015
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.291757	0.150955	1.932747	0.0657
LY(-1)	-0.045406	0.032116	-1.413776	0.1708
LOX	-0.006366	0.019229	-0.331074	0.7436
LNOX	0.011395	0.022560	0.505094	0.6183
LNOX(-1)	0.005619	0.026704	0.210414	0.8352
LNOX(-2)	-0.002926	0.024655	-0.118666	0.9066
LNOX(-3)	0.028497	0.024980	1.140775	0.2657
LNOX(-4)	0.005264	0.020885	0.252040	0.8032

R-squared	0.251506	Mean dependent var	0.022321
Adjusted R-squared	0.023703	S.D. dependent var	0.045813
S.E. of regression	0.045267	Akaike info criterion	-3.134845
Sum squared resid	0.047129	Schwarz criterion	-2.764784
Log likelihood	56.59010	Hannan-Quinn criter.	-3.014214
F-statistic	1.104051	Durbin-Watson stat	2.284161
Prob(F-statistic)	0.393536		


1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
94
96
98
00
02
04
06
08
10
12
14
CUSUM of Squares
5% Significance