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Examining the Impact of Export-Led Growth Strategy: Evidences From Nigeria (1960 – 2015)

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ABSTRACT: *The Nigerian economy had for decades been dependent on the fragile leg of crude oil exports. An emerging trend however suggests that in the last ten years the economy was growing without job creation and poverty reduction consequent upon fall in the international oil markets. Expectedly, attention of scholars had shifted towards the development of non-oil exports as a substitute for this quagmire. This study analyses Export-Led Growth Strategy in Nigeria using Annual Data between 1960 and 2015. The study adopted the Autoregressive Distributed Lag (ARDL) Approach on a modified Cobb Douglass Production Function in the analysis. The choice of ARDL is informed by many considerations: it can be used irrespective of whether the regressors are I(1) or I(0) or a mixture of both. Results of the findings revealed that oil exports are directly related to GDP while non-oil exports are not, and implacably non-oil exports do not impact on GDP. The study also revealed that there is a long run relationship between GDP and both components of exports (oil and non-oil) which can be used to determine the possible direction of GDP. And in case of distortion in the economy, equilibrium can be restored at 12 per cent growth rate per annum as one of the study revelations.*
The study among others recommends that government should diversify the economy to ensure maximum contributions from all facets of the same to enhance economic growth of the country.
Key Words: *Export-Led Growth, Real GDP, Oil Exports, Non-oil Exports, ARDL.*
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I. INTRODUCTION

Exports are considered as important contributors to economic growth. Most of the developing countries in the 1950s and 1960s under colonial administrations adopted Import Substitution Strategy (ISS) to boost economic growth followed by considerable shift toward Exports Promotion Strategy started from the early 1970s mostly in the post-independence era. This is because Export-Led Growth Strategy postulates a strong relationship between the growth of exports and the economy such that export expansion becomes one of the main determinants of economic growth. The trend shows that the overall growth of different sectors could be enhanced through exports particularly that the growth of exports plays a major role in the growth process by stimulating demand and encouraging savings and capital accumulation. The process also increases the supply potential of the economy, by raising the capacity to import.

Since countries require foreign exchange for their developmental needs (capital, goods, industries, raw materials, food, oil and non-oil), export earnings are more efficient means to finance these needs than foreign debt since the latter is vulnerable to adverse exogenous shocks and currency risks that may lead to debt defaults and crisis. This implies that export growth should be in pace with, or ahead of import growth. Olayinka. (2013), argues that Export-Led Strategies allow an expansion of aggregate demand without much inflationary pressure and without the danger of a wage-price spiral, compared with strong domestic demand injections. This partly stems from the real appreciation of the currency that result from large export earnings, which tame inflation and allow real wages to rise (Pakasa and Mardiana, 2012).

This study seeks to examine the impact of Export-Led Growth Strategy in Nigeria between (1960 - 2015) using secondary data sourced from Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS). And the variables to be analyzed are real GDP and the component of exports (oil and non-oil).

The study will apply Auto Regressive Distributed Lag (ARDL) Approach on a modified Cobb-Douglas production function.The broad objective of this study is to examine the Impact of Export-Led Growth Strategy for Nigeria. Specific objectives include:

i. To analyses the magnitude of influence which total exports exerts on the level of economic growth in Nigeria.
ii. To proffer suggestions and recommendations for economic expansion and growth via export business.

The following null hypotheses are formulated to guide this study.

Ho1: There is no significant relationship between real GDP (as a growth variable) and the component of exports (oil and non-oil).
Ho2: That oil and non-oil exports do exert the same magnitude of impact on economic growth of Nigeria.

II. THEORETICAL FRAMEWORK AND EMPIRICAL REVIEW OF LITERATURE

2.1 Classical Growth Theory

The classical growth theory is rooted in the concept of *laissez-faire* economic market pioneered by Adam Smith (1776), which is also known as free-market. It requires little or no government intervention. It also allows individuals to act according to their own self-interest regarding economic decisions. This ensures that economic resources are allocated according to the desires of individuals and businesses in the marketplace (Harris, 1981).

The classical growth theory which was led by Adam Smith (1776) was based on the belief that economic growth ends when a population increases. The classical economists believed that an increase in the Gross Domestic Product causes the population to increase. This population increase has an adverse effect on the economy as resources become limited due to higher demand. As resources become limited, the gross domestic products decreases and parts of the population also decrease. Smith postulated that a change in supply will be matched by change in demand, so that the economy will always move towards equilibrium. He also argued that output growth is driven by population growth, investment, land and increase in overall productivity. He viewed savings as the creator of investment and hence growth; and income distribution determines how fast or slow a nation's economy grows. However, he implicitly established a positive relationship between export and growth. He emphasized that labor is the most important factor of production as other factors (Pasinetti, 1974).

Although, Smith postulation was seen from the point of view of the growth of wealth of nations, hence the principle of national advantage was regarded as an essential criterion of economic policy. So from these perspectives, he shows that the exercise of individual initiative under freely competitive conditions to promote individual ends would produce results beneficial to society as a whole. Conflicting economic interests of different groups could be reconciled by the operation of competitive market forces and by the limited activity of responsible government (Sraffa, 1960).

As a result of his work on economic analysis, the classical economists were able to provide an account of the broad forces that influence economic growth and of the mechanisms underlying the growth process. An important achievement was the recognition that the accumulation and productive investment of a part of the social product is the main driving force behind economic growth and it takes the form mainly of the reinvestment of profit under capitalism (Lewis, 1955).

2.1.2 Neo-Classical Growth Theory

The neoclassical growth theory was developed in the late 1950s and 1960s as a result of intensive research in the field of growth economics. The American economist, Robort Solow (1956), (who won a Nobel Prize in economics) and the British economist, J.E. Meade (1961) are the two well-known contributors to the neoclassical theory of growth. This theory stresses on capital accumulation and is related to the decision of saving as an important determinant of economic growth. The theory considered a two-factor production function with capital and labor as determinants of output. Besides, it added an exogenously determined factor, i.e technology, to the production function (Mauro and Kevin, 2009).

Neoclassical growth theory is an economic theory that outlines how a steady economic growth rate can be accomplished with the proper amounts of labour, capital and technology. The theory states that by varying the amounts of labour and capital in the production function, an equilibrium state can be accomplished. The theory also argues that technological change has a major influence on an economy, and that economic growth cannot continue without advances in technology (Solow, 1956).

2.2 Review of Empirical Literature from Developed Countries

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. Awukuse. (2003) used annual data from 1980 to 2002 to test the Export-Led Growth Hypothesis in Canada. He applied Granger causality from exports to national output growth using vector error correction models and augmented vector autoregressive. The results suggest that a long-run steady state exists among the model and the Granger causal flow is unidirectional from real exports to real GDP.

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.

Henriques and Sadorsky. (2012) used annual data from 1980 to 2010 to test the Export-Led Growth Hypothesis for Canada as well. They applied vector auto regression model and Granger causality test. The results indicate that there exists a long-run steady state among the variables, but a one-way Granger causal relationship, that suggests that the growth rate of GDP influences export growth. They concluded that a change in growth precedes changes in exports.

2.3 Review of Empirical Literature from Emerging Market Economies

Wong (2007) used annual data covering household consumption and government consumption to test the Export-Led Growth Strategy for China from 1978 to 2002. He applied Granger causality among exports, domestic demand and economic growth using time series data. The results show that there is bidirectional Granger causality among these variables, namely exports, domestic demand and economic growth, which shows that there is dynamic relationship among exports, domestic demand and economic growth. He concluded that a successful and sustained economic growth required growth in both exports and domestic demand.

Thomas, (2008) used annual data from 1990 to 2007 to test the Export-Led Growth Hypothesis for Brazil and applied Cobb Douglass production function. The study found that export promotion policies were subordinated to macroeconomic stabilization efforts where exports seemed to have fulfilled a minor role in stimulating economic growth. He therefore concluded that although greater emphasis was given to export promotion policies, but no proof of their effectiveness could be established. Simple regression analyses could not though find a significant relation between export growth and economic growth. He therefore concluded that no significant export-led growth occurred during the studies period.

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 Vector Autoregressive (VAR) model and Granger causality test. The result 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 found out that a unidirectional causality running from exports to economic growth in Korea.

2.4 Review of Empirical Literature from Developing Countries

Emilo (2000) used annual data covering real gross domestic production, real exports, real gross domestic investment, real gross fixed capital formation and population from 1950 to 1997 to test the Export-Led Growth Hypothesis for Costa Rica. He applied Johansen methodology on an augmented Cobb-Douglas production function. Although, the results support the validity of the hypothesis for the studies period but the magnitude of the impact is small. He therefore concluded that exports can serve as an additional engine of growth but not for all of the developing economies.

Phan, Nguyen and Phan. (2003) used annual data covering GDP, exports, investment and population. The results examine the prospective long-term relationship between exports and growth in Vietnam during the period 1975 to 2001. They applied bivariate correlation and Granger-causality tests. They concluded that despite the fact that the export sector has been very robust for more than a decade, but there is no strong econometric evidence to suggest that the export sector has made a remarkable contribution to other sectors of the economy.

Kwawaja and Hiranya, (2004) used quarterly data to test the Export-Led Growth Hypothesis for Bangladesh from 1976 to 2003. They applied Error Correction Model and Granger causality test to investigate the link between exports and economic growth in Bangladesh. They found that industrial production and exports are co-integrated, which indicated that there is a long-run unidirectional causality and no short-run causal relationship between exports and economic growth. Fouad. (2005) used annual data covering real GDP, Net exports, real exports and real gross capital formation from 1977 to 2003 to test the Export-Led Growth Hypothesis for Egypt. He applied a variety of analytical tools, including co-integration analysis, Granger causality tests and unit root test, coupled with vector auto regression (VAR). The results supported the validity of the hypothesis for the studies period but the magnitude of the impact is small. He therefore concluded that exports can serve as an additional engine of growth particularly for Egypt.

Andre and Joel, (2007) used annual data using real GDP, net exports and GDP per capita from the period 1979 to 2005 to test the Export-Led Growth Strategy for Namibia. They applied time series econometric techniques in the form of Granger causality and co-integration. The results revealed that exports Granger cause GDP and GDP per capita. This suggests that the export-led growth strategy through various incentives has a positive influence on growth.

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 correction 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.

Andre and Joel. (2007) investigated the causal relationship between export and economic growth for Botswana using quarterly GDP from 1980 to 2006. They applied Granger causality test. The result showed that there is bi-directional causality between export and economic growth. It also showed that export in Botswana can be raised by increasing economic growth and that economic growth can be boosted by exporting more products.

Hausmann and Klinger. (2008) also used annual data from 1975 to 2005 to test the Export-Led Growth Strategy for Columbia. He applied Granger causality test which supported the validity of export-led growth strategy in Colombia. He suggested that foreign direct investment should be improved by public spending on infrastructure and training which has sector specific consequences.

Saima, et.al. (2008) used annual data from 1971 to 2005 to test the Export-Led Growth Strategy in Pakistan. The study used the most recent co-integration technique which refers to as distributed lag model. The results indicated that export, labor force and imports have positive effect on growth, while the terms of trade has a negative effect. The study concluded that the export-led growth in Pakistan is supported in both the short and long-run bases but the labor force participation rate has a negative effect only in the short-run.

2.5 Review of Empirical Literature from Nigeria

Dennis (2000) used annual data from 1970 to 2000 to test the Export-Led Growth Hypothesis for Nigeria. He applied two-stage least square estimation method. The results showed that export and government expenditures are the major determinants of aggregate output, it also showed that increasing productivity growth in exports and government expenditures has positively impacted on output growth. The study suggested that policy makers should set the options and tools for accelerating economic growth through exports promotion and appropriate management of government expenditure. Kareem (2002) used annual data to test the Export-Led Growth Hypothesis for Nigeria from 1970 to 2000. He applied Co-integration and Granger causality tests. The finding shows that there is significant feedback causality between exports and economic growth. The study suggested that government should pursue both the inward and outward oriented industrial strategy.

Adesoji and Sotubo, (2013) used annual data from 1981 to 2010 to evaluate the performance of Export-Led Growth Strategy in Nigeria and applied Granger causality test. Findings from the study revealed that non-oil exports perform below expectations giving reasons to doubt the effectiveness of the exports promotion strategies that have been adapted to the Nigerian economy. The study suggested that the government should put in place those policies that will enhance the productivity of both individual sectors and subsectors of the economy which will encourage the exportation of non-oil commodities.

Onodugo, Ikpe and Anowor (2013) used annual data from 1981 to 2012 to test the Export-Led Growth Hypothesis for Nigeria. The study adopted augmented production function employing the Endogenous Growth Model in its analysis and the conventional tests of co-integration were employed. The findings though revealed a very weak and infinitesimal impact of export-led growth in Nigeria.

III. THE RESEARCH METHODOLOGY

3.1 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). The time series data to be used for the estimation is on Annual basis. The definition of each of the variables used in the study follows the metadata of the institution where the data is obtained.

3.2 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 where derived in detail in-turn is as follows:

Real Growth Domestic Product: Following the work of Ari (2002), Bernard (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 by *y*. In line with National Bureau of Statistics computational procedure, real GDP is given as: $yt = Ct + It + Gt + (Xt - Mt)PIt$ (3.1)

Where *y* represents real gross product, *C* is consumption expenditure, *I* stands for private domestic investment, *G* denotes government 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 the 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 the 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.

3.3 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 an error correction equation will be modelled 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: $yt = oxt + noxt + \mu t$ (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.

3.4 Co-integration Test

The study adopted Autoregressive Distributed Lag Approach 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: $\Delta Lyt = \alpha + \Sigma\beta i,1\Delta Lyt-imi=1+ \Sigma\beta i,2\Delta Loxt-ini=0+ \Sigma\beta i,3\Delta Lnoxt-ioi=0+ \gamma 1Lyt-1+ \gamma 2Loxt-1+ \gamma 3Lnoxt-1+ \mu t$ (3.3)

Where y represents real GDP, ox is real oil exports, nox stands for real non-oil exports, L is natural logarithm, Δ is first difference operator, βi,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: $\Delta Lyt = \alpha + \Sigma\beta i,1\Delta Lyt-imi=1+ \Sigma\beta i,2\Delta Loxt-ini=0+ \Sigma\beta i,3\Delta Lnoxt-ioi=0+ ECMt-1$ (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 Hypothesis. 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 analysis, autocorrelation and heteroskedasticity tests will be conducted to determine their presence in the estimated models so as to avoid spurious regression results.

IV. DATA PRESENTATION, ANALYSIS AND RESULTS INTERPRETATION

4.1 Summary Statistics

	LY	LNOX	LOX
Mean	5.74	1.59	3.77
Median	5.42	0.89	3.34
Maximum	11.45	7.03	9.57
Minimum	0.80	-1.59	-4.73
Std. Dev.	3.47	2.92	4.27
Skewness	0.04	0.61	-0.21
Kurtosis	1.62	1.89	1.87
Jarque-Bera	4.48	6.37	3.40
Probability	0.11	0.04	0.18
Sum	321.39	89.02	211.06
Sum Sq. Dev.	661.97	468.76	1003.83
Observations	56	56	56

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 5.74, 5.42, 11.45 and 0.80, respectively. In the same vein, the nonoil exports (LNOX), within the study periods returns 1.59, 0.89, 7.03 and -1.59 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 3.77, 3.34, 9.57 and -4.73 respectively. The skewness of LY, LNOX and LOX were 0.04, 0.61 and -0.21, implying that while national output and nonoil exports were positively skewed, oil exports is negatively skewed. The minimum observation of -4.73 and the maximum of 11.45 shows that the distribution, although not explosive but asymmetrical.

4.2 Unit Root Test

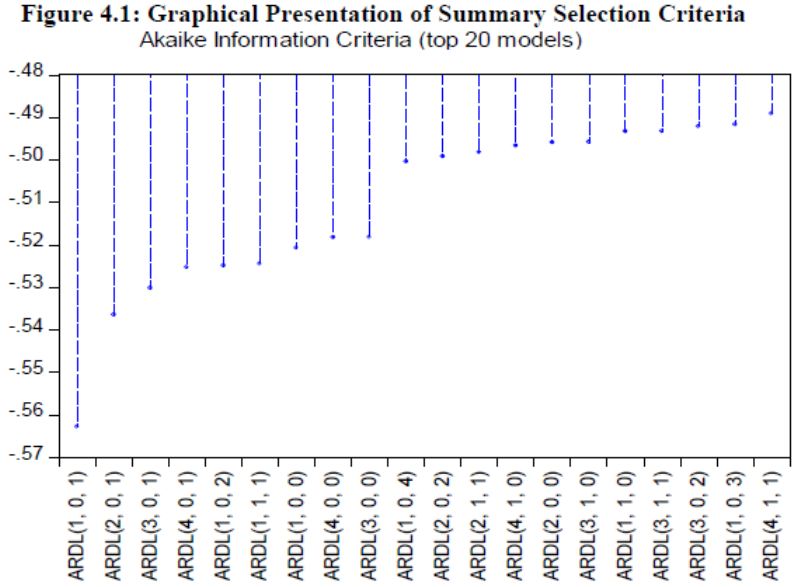
Table 4.2: Unit Root Test

	ADF - AIC		Phillip-Perron	
	Level	First Diff.	Level	First Diff.
LY	-3.008237		-3.014327	-7.131141*
LNOX	-1.927102	-7.644896*	-1.897059	-7.72672*
LOX	-2.534447	-7.796057*	-2.578904	-8.052134*

Source: Computed by Author using Eviews 9

The results of the unit root test conducted on the variables used for the estimations are reported as Table 4.2 It is clear from Table 4.2 that all the variables are first differenced 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.

Figure 4.1: Graphical Presentation of Summary Selection Criteria



4.3 Short Run Dynamics (Error Correction Model)

Table 4.3: Short Run Dynamics (Error Correction Model) - ARDL(1,0,1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ(LNOX)	-0.003	0.062	-0.062	0.951
Δ(LOX)	0.026	0.049	5.208	0.000
ECM(-1)	-0.120	0.018	-6.512	0.000
R^2 = 0.99; AIC = -0.604, SBC = -0.421, HQC = -0.533; DW = 2.217				
Adj. R^2 = 0.99; F-Stats = 5412.779, 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 as Table 4.3. The lag 1 coefficient of the error correction term yields 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 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 true. 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 runs 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 runs are not only in line with economic theory adopted in this study 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.

4.4 Post Estimation Diagnostics Tests

Table 4.4: Post Estimation Diagnostics Tests

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.184	Prob. F(2,48)	0.315
Obs*R-squared	2.585	Prob. Chi-Square(2)	0.275
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.444	Prob. F(4,50)	0.776
Obs*R-squared	1.885	Prob. Chi-Square(4)	0.757
Scaled explained SS	4.659	Prob. Chi-Square(4)	0.324

Source: Computed by Author using Eviews 9

To avoid the possibility of interpreting a superior results and making inference therefrom 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 0.315 and 0.275 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 0.776, 0.757 and 0.324 respectively, implying lack of evidence of Heteroskedasticity.

Figure 4.2: Cumulative Sum of Residual Test

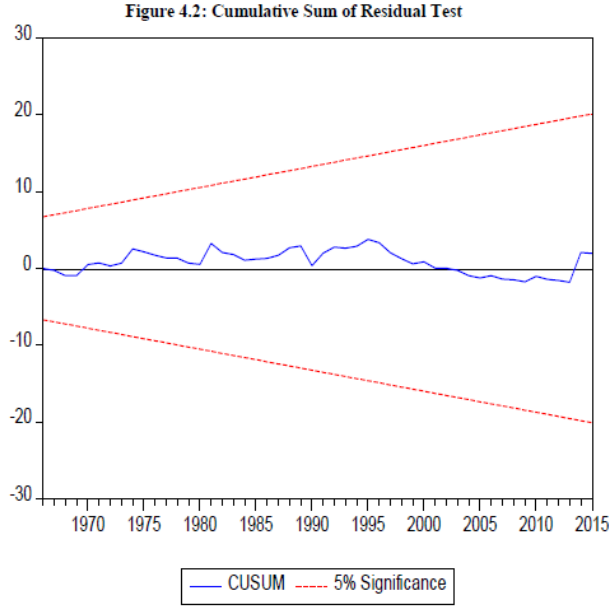


Figure 4.2 shows that the model and the estimated parameters are largely stable but not throughout the study period. Close examination of the figure reveals that the chart veers outside the critical line of 0.05 between 2012 and 2013, although the break did not persist.

4.5 Summary of Findings

The 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, a cointegration 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 as 12 per cent per annum.

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

V. CONCLUSION AND RECOMMENDATIONS

The study examined 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.

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.

5.1 Conclusion

Following the findings of the study, we conclude 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) Results of this research had established that the performance of non-oil exports and their contribution to GDP is sub-optimal. Therefore, it is easy to see why the contribution of nonoil exports has remained insignificant despite the various policies that were implemented by governments. The various policies that were implemented to correct this problem had failed, because the workability of such policies was not properly implemented for other reasons.

b) The study provides support for Growth-Led Export Strategy. Thus effort should be direct towards policies that will enhance economic growth such as import substitution industrialization (ISI) strategy, in order to exert more impact on exports and consequently the GDP and Economic Growth.

5.2 Recommendations

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

Based on these findings the following recommendations are proffered:

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a) The government should put in place those policies that will enhance the productivity of the individual sectors and subsectors of the economy that will encourage the exportation of nonoil commodities, in order to increase the revenue that accrues to the economy through the exports of nonoil commodities, and also put in place those policies that will enhance the productivity.

b) Reducing trade dependence on developed countries by looking for other markets particularly developing countries. Inter-regional trade between sub-Saharan African countries should also be encouraged because of their relatively low transportation cost and tax importation barriers.

c) The government should also encourage private investment at both local and foreign dimensions through adequate provision of infrastructures.

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Appendices

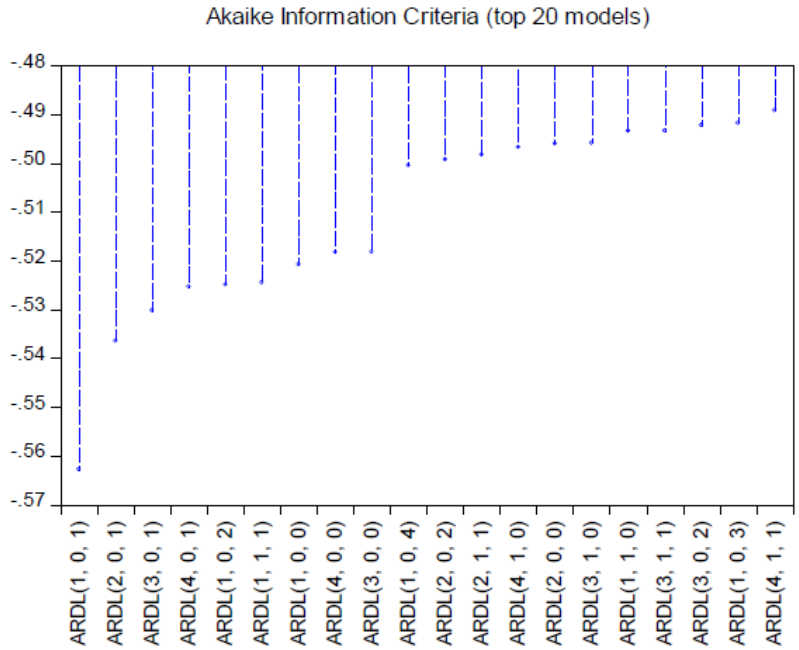
Results of the Estimated Model

Dependent Variable: LY
Method: ARDL
Date: 11/07/16 Time: 14:19
Sample (adjusted): 1961 2015
Included observations: 55 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNOX LOX
Fixed regressors: C
Number of models evalulated: 100
Selected Model: ARDL(1, 0, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LY(-1)	0.879762	0.050948	17.26781	0.0000
LNOX	-0.005096	0.025138	-0.202725	0.8402
LOX	0.258402	0.056287	4.590773	0.0000
LOX(-1)	-0.147001	0.059696	-2.462512	0.0173
C	0.404403	0.153032	2.642599	0.0110

R-squared	0.997696	Mean dependent var	5.828779
Adjusted R-squared	0.997512	S.D. dependent var	3.435030
S.E. of regression	0.171351	Akaike info criterion	-0.603698
Sum squared resid	1.468057	Schwarz criterion	-0.421213
Log likelihood	21.60170	Hannan-Quinn criter.	-0.533130
F-statistic	5412.779	Durbin-Watson stat	2.217099
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.



Model Selection Criteria Table
Dependent Variable: LY
Date: 11/07/16 Time: 14:21
Sample: 1960 2015
Included observations: 55

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
99	19.632384	-0.562784	-0.375164	-0.490855	0.997234	ARDL(1, 0, 1)
74	19.947069	-0.536426	-0.311282	-0.450111	0.997208	ARDL(2, 0, 1)
49	20.785136	-0.530198	-0.267530	-0.429497	0.997237	ARDL(3, 0, 1)
24	21.657663	-0.525295	-0.225103	-0.410208	0.997267	ARDL(4, 0, 1)
98	19.647777	-0.524914	-0.299771	-0.438600	0.997176	ARDL(1, 0, 2)
94	19.636530	-0.524482	-0.299338	-0.438167	0.997175	ARDL(1, 1, 1)
100	17.539096	-0.520734	-0.370639	-0.463191	0.997065	ARDL(1, 0, 0)
25	20.474958	-0.518268	-0.255600	-0.417567	0.997204	ARDL(4, 0, 0)
50	19.474008	-0.518231	-0.293088	-0.431916	0.997157	ARDL(3, 0, 0)
96	21.011590	-0.500446	-0.200254	-0.385360	0.997198	ARDL(1, 0, 4)
73	19.979837	-0.499225	-0.236557	-0.398524	0.997150	ARDL(2, 0, 2)
69	19.953868	-0.498226	-0.235558	-0.397525	0.997147	ARDL(2, 1, 1)
20	20.914090	-0.496696	-0.196504	-0.381609	0.997188	ARDL(4, 1, 0)
75	17.895222	-0.495970	-0.308350	-0.424041	0.997043	ARDL(2, 0, 0)
45	19.891346	-0.495821	-0.233154	-0.395121	0.997140	ARDL(3, 1, 0)
95	17.827683	-0.493372	-0.305753	-0.421444	0.997036	ARDL(1, 1, 0)
44	20.825883	-0.493303	-0.193112	-0.378217	0.997178	ARDL(3, 1, 1)
48	20.796673	-0.492180	-0.191988	-0.377093	0.997175	ARDL(3, 0, 2)
97	19.785232	-0.491740	-0.229072	-0.391039	0.997128	ARDL(1, 0, 3)
19	21.717022	-0.489116	-0.151401	-0.359644	0.997210	ARDL(4, 1, 1)
89	19.696264	-0.488318	-0.225650	-0.387617	0.997119	ARDL(1, 2, 1)
23	21.666593	-0.487177	-0.149461	-0.357705	0.997205	ARDL(4, 0, 2)
93	19.650680	-0.486565	-0.223897	-0.385864	0.997113	ARDL(1, 1, 2)
79	21.640654	-0.486179	-0.148464	-0.356707	0.997202	ARDL(1, 4, 1)
71	21.179915	-0.468458	-0.130743	-0.338986	0.997152	ARDL(2, 0, 4)
54	22.108952	-0.465729	-0.090490	-0.321871	0.997186	ARDL(2, 4, 1)
84	20.104914	-0.465574	-0.165382	-0.350487	0.997099	ARDL(1, 3, 1)
64	20.058608	-0.463793	-0.163601	-0.348706	0.997094	ARDL(2, 2, 1)
70	18.055523	-0.463674	-0.238530	-0.377359	0.996998	ARDL(2, 1, 0)

72	20.055200	-0.463662	-0.163470	-0.348575	0.997093	ARDL(2, 0, 3)
91	21.046320	-0.463320	-0.125605	-0.333848	0.997137	ARDL(1, 1, 4)
15	20.997665	-0.461449	-0.123733	-0.331977	0.997132	ARDL(4, 2, 0)
68	19.988250	-0.461087	-0.160895	-0.346000	0.997086	ARDL(2, 1, 2)
90	17.913637	-0.458217	-0.233073	-0.371902	0.996981	ARDL(1, 2, 0)
40	19.895943	-0.457536	-0.157345	-0.342450	0.997076	ARDL(3, 2, 0)
47	20.864870	-0.456341	-0.118626	-0.326869	0.997117	ARDL(3, 0, 3)
39	20.839993	-0.455384	-0.117669	-0.325912	0.997114	ARDL(3, 2, 1)
43	20.834312	-0.455166	-0.117451	-0.325694	0.997114	ARDL(3, 1, 2)
14	21.821766	-0.454683	-0.079444	-0.310825	0.997155	ARDL(4, 2, 1)
92	19.788482	-0.453403	-0.153212	-0.338317	0.997063	ARDL(1, 1, 3)
80	19.777458	-0.452979	-0.152788	-0.337893	0.997062	ARDL(1, 4, 0)
88	19.745938	-0.451767	-0.151576	-0.336681	0.997059	ARDL(1, 2, 2)
18	21.730709	-0.451181	-0.075942	-0.307323	0.997145	ARDL(4, 1, 2)
22	21.703552	-0.450137	-0.074897	-0.306279	0.997142	ARDL(4, 0, 3)
46	21.669211	-0.448816	-0.073577	-0.304958	0.997138	ARDL(3, 0, 4)
78	21.644620	-0.447870	-0.072631	-0.304012	0.997136	ARDL(1, 4, 2)
29	22.422900	-0.439342	-0.026579	-0.281099	0.997152	ARDL(3, 4, 1)
59	20.390539	-0.438098	-0.100382	-0.308626	0.997064	ARDL(2, 3, 1)
4	23.291829	-0.434301	0.015986	-0.261672	0.997177	ARDL(4, 4, 1)
30	21.263112	-0.433197	-0.057957	-0.289339	0.997093	ARDL(3, 4, 0)
9	22.224639	-0.431717	-0.018954	-0.273473	0.997130	ARDL(4, 3, 1)
10	21.221104	-0.431581	-0.056342	-0.287723	0.997089	ARDL(4, 3, 0)
53	22.209064	-0.431118	-0.018355	-0.272874	0.997129	ARDL(2, 4, 2)
65	18.186626	-0.430255	-0.167587	-0.329554	0.996946	ARDL(2, 2, 0)
66	21.186214	-0.430239	-0.055000	-0.286381	0.997085	ARDL(2, 1, 4)
5	22.181325	-0.430051	-0.017288	-0.271807	0.997126	ARDL(4, 4, 0)
85	18.171142	-0.429659	-0.166992	-0.328959	0.996944	ARDL(1, 3, 0)
55	20.161792	-0.429300	-0.091584	-0.299828	0.997038	ARDL(2, 4, 0)
86	21.143057	-0.428579	-0.053340	-0.284721	0.997080	ARDL(1, 2, 4)
83	20.131504	-0.428135	-0.090420	-0.298663	0.997035	ARDL(1, 3, 2)
63	20.064837	-0.425571	-0.087855	-0.296099	0.997027	ARDL(2, 2, 2)
67	20.061127	-0.425428	-0.087713	-0.295956	0.997027	ARDL(2, 1, 3)
34	20.970559	-0.421945	-0.046705	-0.278087	0.997060	ARDL(3, 3, 1)
35	19.929113	-0.420350	-0.082635	-0.290878	0.997011	ARDL(3, 3, 0)
42	20.919302	-0.419973	-0.044734	-0.276115	0.997055	ARDL(3, 1, 3)
21	21.917205	-0.419893	-0.007129	-0.261649	0.997096	ARDL(4, 0, 4)
13	21.892857	-0.418956	-0.006193	-0.260712	0.997094	ARDL(4, 2, 2)
87	19.867162	-0.417968	-0.080253	-0.288496	0.997004	ARDL(1, 2, 3)
38	20.843082	-0.417042	-0.041802	-0.273184	0.997046	ARDL(3, 2, 2)
17	21.783258	-0.414741	-0.001978	-0.256497	0.997081	ARDL(4, 1, 3)
41	21.766462	-0.414095	-0.001332	-0.255851	0.997079	ARDL(3, 1, 4)
77	21.644998	-0.409423	0.003340	-0.251179	0.997066	ARDL(1, 4, 3)
81	21.600636	-0.407717	0.005046	-0.249473	0.997061	ARDL(1, 3, 4)
28	22.501161	-0.403891	0.046396	-0.231261	0.997090	ARDL(3, 4, 2)
58	20.401822	-0.400070	-0.024831	-0.256212	0.996995	ARDL(2, 3, 2)
60	18.389052	-0.399579	-0.099388	-0.284493	0.996901	ARDL(2, 3, 0)
8	22.304743	-0.396336	0.053951	-0.223707	0.997068	ARDL(4, 3, 2)
3	23.293850	-0.395917	0.091894	-0.208902	0.997105	ARDL(4, 4, 2)
61	21.272665	-0.395103	0.017661	-0.236859	0.997023	ARDL(2, 2, 4)
76	22.259195	-0.394584	0.055703	-0.221955	0.997063	ARDL(1, 4, 4)
52	22.222895	-0.393188	0.057099	-0.220559	0.997059	ARDL(2, 4, 3)
82	20.144452	-0.390171	-0.014932	-0.246313	0.996965	ARDL(1, 3, 3)
62	20.128039	-0.389540	-0.014301	-0.245682	0.996964	ARDL(2, 2, 3)
16	22.016217	-0.385239	0.065048	-0.212610	0.997035	ARDL(4, 1, 4)
33	20.976316	-0.383704	0.029059	-0.225461	0.996989	ARDL(3, 3, 2)
12	21.932440	-0.382017	0.068270	-0.209387	0.997025	ARDL(4, 2, 3)
37	20.925455	-0.381748	0.031015	-0.223505	0.996983	ARDL(3, 2, 3)
36	21.786400	-0.376400	0.073887	-0.203771	0.997009	ARDL(3, 2, 4)

56	21.719519	-0.373828	0.076459	-0.201198	0.997001	ARDL(2, 3, 4)
27	22.704491	-0.373250	0.114561	-0.186234	0.997038	ARDL(3, 4, 3)
51	22.607168	-0.369506	0.118304	-0.182491	0.997027	ARDL(2, 4, 4)
2	23.482500	-0.364712	0.160623	-0.163311	0.997050	ARDL(4, 4, 3)
7	22.467101	-0.364119	0.123692	-0.177104	0.997011	ARDL(4, 3, 3)
57	20.402695	-0.361642	0.051121	-0.203399	0.996922	ARDL(2, 3, 3)
31	22.160961	-0.352345	0.135466	-0.165329	0.996976	ARDL(3, 3, 4)
32	21.149963	-0.351922	0.098365	-0.179292	0.996935	ARDL(3, 3, 3)
11	22.121305	-0.350819	0.136991	-0.163804	0.996971	ARDL(4, 2, 4)
26	22.981726	-0.345451	0.179884	-0.144050	0.996993	ARDL(3, 4, 4)
6	22.662595	-0.333177	0.192158	-0.131776	0.996956	ARDL(4, 3, 4)
1	23.488963	-0.326499	0.236360	-0.110712	0.996971	ARDL(4, 4, 4)

ARDL Bounds Test
Date: 11/07/16 Time: 14:21
Sample: 1961 2015
Included observations: 55
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	10.65923	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Test Equation:
Dependent Variable: D(LY)
Method: Least Squares
Date: 11/07/16 Time: 14:21
Sample: 1961 2015
Included observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOX)	0.256822	0.055669	4.613384	0.0000
C	0.406674	0.147638	2.754526	0.0082
LNOX(-1)	-0.004702	0.023947	-0.196346	0.8451
LOX(-1)	0.111562	0.034050	3.276399	0.0019
LY(-1)	-0.120909	0.049538	-2.440722	0.0182

R-squared	0.353269	Mean dependent var	0.193623
Adjusted R-squared	0.301531	S.D. dependent var	0.205033
S.E. of regression	0.171355	Akaike info criterion	-0.603647
Sum squared resid	1.468132	Schwarz criterion	-0.421162
Log likelihood	21.60030	Hannan-Quinn criter.	-0.533079
F-statistic	6.827980	Durbin-Watson stat	2.211554
Prob(F-statistic)	0.000182		

ARDL Cointegrating And Long Run Form
Dependent Variable: LY
Selected Model: ARDL(1, 0, 1)
Date: 11/07/16 Time: 14:22
Sample: 1960 2015
Included observations: 55

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNOX)	-0.003830	0.061880	-0.061901	0.9509
D(LOX)	0.258028	0.049542	5.208234	0.0000
CointEq(-1)	-0.120161	0.018452	-6.511962	0.0000

Cointeq = LY - (-0.0424*LNOX + 0.9265*LOX + 3.3633)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNOX	-0.042383	0.220259	-0.192424	0.8482
LOX	0.926503	0.178938	5.177792	0.0000
C	3.363345	0.391346	8.594299	0.0000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.183714	Prob. F(2,48)	0.3149
Obs*R-squared	2.585174	Prob. Chi-Square(2)	0.2746

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 11/07/16 Time: 14:22
Sample: 1961 2015
Included observations: 55
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LY(-1)	0.036584	0.057099	0.640714	0.5248
LNOX	-0.015436	0.027169	-0.568140	0.5726
LOX	-0.002091	0.056491	-0.037019	0.9706
LOX(-1)	-0.017985	0.061943	-0.290347	0.7728
C	-0.109188	0.171635	-0.636167	0.5277
RESID(-1)	-0.173650	0.158348	-1.096641	0.2783
RESID(-2)	-0.224397	0.174875	-1.283185	0.2056

R-squared	0.047003	Mean dependent var	-2.58E-17
Adjusted R-squared	-0.072121	S.D. dependent var	0.164883
S.E. of regression	0.170725	Akaike info criterion	-0.579115
Sum squared resid	1.399054	Schwarz criterion	-0.323636
Log likelihood	22.92565	Hannan-Quinn criter.	-0.480319
F-statistic	0.394571	Durbin-Watson stat	2.054460
Prob(F-statistic)	0.878889		

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.443694	Prob. F(4,50)	0.7764
Obs*R-squared	1.885333	Prob. Chi-Square(4)	0.7568
Scaled explained SS	4.658845	Prob. Chi-Square(4)	0.3241