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Validity of Export-Led Growth Hypothesis in the Nigeria Oil And Non-Oil Exports: Evidence from Ardl and Causality Test Approaches

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Abstract: Numerous studies have tested the validity of the export-led growth hypothesis, yet, fewer studies have considered the disaggregated exports into oil and non-oil exports-growth nexus and also test whether oil and non-oil exports cause economic growth in the literature. Therefore, this study tests the validity ofthe export-led growth hypothesis in Nigeria's oil and non-oil exports over the study period of 1970 to 2021. In line with the specific objectives of this study, autoregressive distributed lag (ARDL) and Granger causality tests were employed to estimate the short-run and long-run export-growth relationship as well as test the validity of the export-led growth hypothesis respectively. Annual secondary data was employed for this study. Results of this study found that oil exports and non-oil exports have negative and positive significant effects on economic growth in the short run and long run at 1% and 10% respectively. Furthermore, the findings revealed that the export-led growth hypothesis (ELGH) is not valid because the unidirectional causal relationship between oil and non-exports to economic growth was not statistically significant in Nigeria. Lastly, the study recommends the need to intensify the exports drive policies to improve and strengthen the oil exports and non-oil export sectors that will cause economic growth in the country, Nigeria.

Keywords: Export-led growth hypothesis; Oil exports, Non-oil exports; Economic growth; Causality test ARDL

Jel Classification: F20; F21; F43; 055

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1. Introduction

Exports have been widely accepted as one of the components of aggregate demand, hence, both developed and developing economies have continually used export as a development strategy to drive economic growth (Benli, 2020). While exportation of goods and services has served as a source of foreign earnings, employment generation, increasing per capita income, poverty reduction, appreciating country's exchange rate, and overall, driving stimulus to economic growth (Riti, Gubak & Madina, 2016; Abou-Stait, 2005).

Importantly, the absolute advantage theory in 1776 by Adam Smith and followed by David Ricardo who propounded the comparative cost advantage in 1817, are traceable to exports as an engine of economic growth (Benli, 2020). Furthermore, the neo-classical growth through the trade liberalization policies also upholds that export leads growth strategy and thus creates other spillovers such as competitiveness, technological advance, employment generation, export promotion, and import expansion.

Owing to the theoretical underpinning, the export-led growth strategy was developed in the mid-20th centuryand pioneered by Germany and Japan in the 1950s and 1960s respectively andhas been largely beneficiary and stimulus to their economic growth (Palley, 2012). And in the 1970s and 1980s, export–led growth policies were also adopted and resulted in the prominent economic growth of the four East Asian Tiger economies (South Korea, HongKong, Singapore, and Taiwan) (Palley, 2012). Between the 1980s and 1990s, South East Asia, such as Thailand, Malaysia, and Indonesia, were also beneficiaries of the export-led growth strategy, and by the late 1990s, Mexico, one of the Latin American countries also adopted export-led growth with an emphasis on manufacturing sector leading to average annual economic growth from 3.1% between 1940-1970 to 8% between 1970-2000, causing a trajectory and persistent growth level (Moreno-Brid, Valdina & Santamaria, 2005). While in the 2000s, China became the fastest economic growth rate from 12.4 percent in the 1990s to 20.3 percent between 2000 and 2003, and, remarkably, China has been the fastest-growing economy in the world since the 1980s, with an average annual growth rate of 10% since 1978 to 2005, and the above resulted tosignificant improvements in access to health, education, and other services through the policy of export-led growth strategy (Subasat, 2000; Palley, 2012).

Following the success of the export-led growth strategy in the developed and emerging economies, several other developing countries including Nigeria have emulated the export-led growth strategy as against the import-substitution strategy since the introduction of the Structural Adjustment Programme (SAP) in the early 1980s by the World Bank and International Monetary Fund (IMF) (Danladi Naankiel & Naankiel, 2016). Predominantly, SAP was intended to promote an export-led growth strategy in the short-term resulting in to increase in employment growth,

reduce poverty rate, currency appreciation, and changing economic growth from a single-digit rate to a double rate, however, several African countries export-led growth strategy has been a mixed outcomes (Abou-Stait, 2016; Benli, 2020). Specifically, since Nigeria's independence in 1960, the exportation of goods and services has been widely used as a development strategy to drive economic growth. Though, in the early 1960s, non-oil exports such as cocoa, timber, and other agricultural commodities were attributed to greater contributions to Nigeria's economic growth, resulting in 25.10 percent highest economic growth rate in 1970, however, since the discovery of crude oil and Nigeria membership of Organization of Petroleum Exporting Countries (OPEC) in 1971, oil exports have become the largest contributor to government revenue but a drastic lower contribution to economic growth in Nigeria of about 3.10 percent as of 2022 (Raheem, 2016; National Centre for Economic Management and Administration, NCEMA, 2013; Sanusi, 2010; National Bureau of Statistics, NBS, 2023). Besides the export-growth direct effect, Nigeria's oil and non-oil export-led growth strategy has continually generated negative spillovers such as a rising unemployment rate, depreciationof the naira against international currencies like the Dollar, Pounds, among others currencies, resource curse, among others (National Centre for Economic Management and Administration (NECMA), 2013; Kusakci, 2012).

In this foregoing, several studies have been conducted to test the export-led growth strategy in the Nigeria oil and non-oil export literature. Numerous studies (Ogunsanwo, Obisesan & Olowe, 2020; Raheem, 2019; Riti, Gubak & Madina, 2016; Klein, 2010; Moreno-Bird, Valdivia & Santamaria, 2005; Ugwuegbe & Chinyere, 2013) have examined the relationship among oil exports, non-oil exports, and economic growth. While some studies (Ogunsanwo, Obisesan & Olowe, 2020; Riti, Gubak & Madina, 2016; Raheem, 2019) have argued that non-oil exports have an impact on economic growth in the short run and long run, other studies (Ugwuegbe & Chinyere, 2013; Benli, 2020) argue that oil exports have an impact on economic growth. However, little or no study that has validated oil and non-oil exports drives economic growth from the Export-led growth strategy hypothesis. Therefore, this is motivated to answer the following research questions: first, what is the direct effect of oil exports, and non-oil exports on short and long-run economic growth in Nigeria? Second, which oil exports or non-oil exports drive higher short and long-run economic growth in Nigeria? Andthird of all, what isthe causal directionamong oil exports, non-oil exports, and economic growth in Nigeria?In answering these questions, this study empirically validates the Export-led Growth Hypothesis (ELGH) from evidence in Nigeria's oil and non-oil exports-growth nexus between1960 and 2022.

2. Literature Review

In line with the specific objectives of this study, the theoretical review is drawn from the export theories and endogenous growth theories, whereas the empirical review is drawn from existing studies on the relationship between exports and economic growth across the economies. The two strands of export theories are the classical and neoclassical international trade theories respectively. Though the classical international trade theories laid the foundations of trade flows and not capital flows among nations of the world that were rooted intrade theories of the 18th and 19th centuries of Smith in 1776 and Ricardo in 1817, exports were not seen as an economic growth strategy, rather as an international gain (Nayak & Choudhury, 2014; Jhingan, 2009). In contrast, the neoclassical trade theories led by Heckscher and Ohlin (1991), MacDougall (1960) and Kemp (1964), and lately, the exports led-growth hypothesis, laid the foundation of country's factors endowments of comparative cost advantage, in factors, countries, and commodities, with the assumptions of capital mobility between the trading countries and expectation of higher returns on capital invested (Kodiyat, 2009; Kurtishi-Kastrati, 2013). Further, unlike previous classical and neo-classical trade theories, the export-led growth theory only considers exports as a development strategy for developing countries to catch up with the developed countries. Figure 1 shows the export theories from classical to neo-classical international trade:

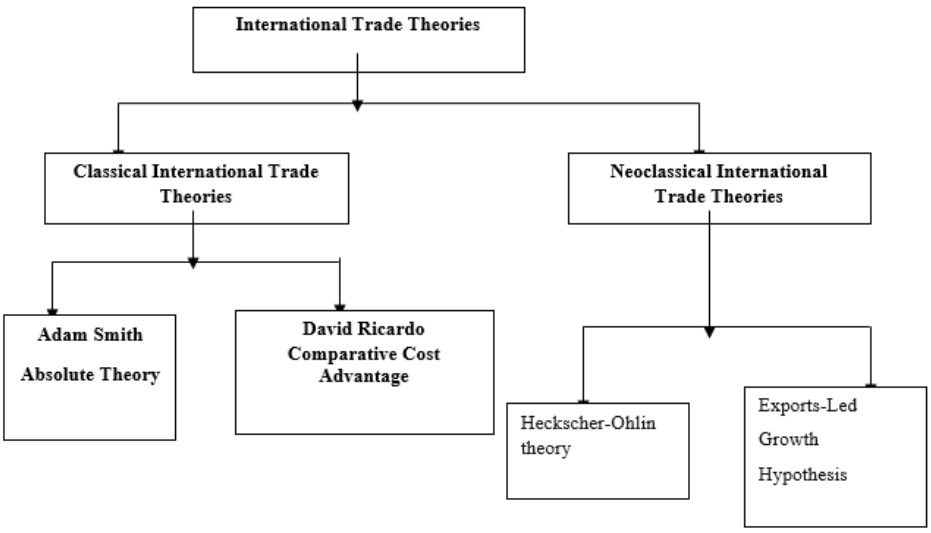

Figure 1. International Trade Theories
Source: Authors, 2023

On the economic growth theories, the classical growththeories postulated that economic growth depends on the size of the country's factors (labour and capital), while neo-classical growth theories like Solow growth theory emphasize

augmentedlabour as well as exogenous factors as the determinants of short-run and long-run economic growth. Although, none of these economic growth theories was specific that economic growth specifically depends on exports. Not until the late mid-20thcentury that the endogenous growth theories, often called the new growth theories pioneered by Paul Romer in his 1986 article and others including Lucas (1988) and Rebelo (1991). More importantly, the new growth theories are based on the assumptions of non-decreasing returns to scale, unlike the unrealistic constant returns by the Swan-Solow growth theory. Also, the assumption of imperfect competition makes the endogenous growth theory, the most realistic and applicable theory for all economies of the world. In addition, the new growth theories are improvements on existing growth theories with emphasis on a broad class of capital investment such as physical capital, human capital, financial capital and above all endogeneity of technological changes as the main determinants of long-run economic growth (Masoud, 2014; Ali, 2011). Also, the endogenous growth theories, unlike previous growth theories, recognize the role of economic structural change and economic development to maximize the exports spillovers as well as the presence of government in promoting economic growth and achieve economic growth convergence amongst developed, emerging and developing economies, including Nigeria as a case study.

As opined by Lucas (1988), the production function in equation (1) is expressed as follows:

$$Y_t = f\,(K_t, H_t\,,\, A_t) \qquad (1)$$

Where *Y*, *K* and *H* are output, physical capital and human capital as different types of investment at *t* and the parameter *A* represents the state of technology progress. In addition, the Lucas (1988) production function eliminates the diminishing return of individual function, implying that the economy grows without bounds and no convergence around economies as predicted by previous growth theories. Also, the endogeneity of technological changes in equation (1), for instance, changes in human capital, change in infrastructure, change in trade regime (i.e. trade openness), and others from the change in capital factor input (human and physical capital) results to both a direct effect on output (GDP growth rate) and indirect (spillovers) effect on domestic investment, poverty, the standard of living, and technological changes, such as technological gap through the catch-up hypothesis (relative backwardness) to determine the long-run economic growth (Masoud, 2014; Ali, 2011; Mankiw, Romer & Weil, 1992).

Despite the numerous contributions of the endogenous growth theory that have led to the realistic and applicability of long-run economic growth by all economies (i.e. developed, emerging and developing), the neo-classical growth theory failed to specify the technological progress factors in the production function that causes economic growth differences across nations (Ho et al, 2007 cited in Ali, 2011;

Todaro & Smith, 2003). These technological progress factors are commonly known as structural change in most empirical studies but diverse and inconsistent in the variables used to represent the structure change. In addition, despite the recognition of exports as a proxy for structural change, the endogenous growth theory did not specify which of the technological progress can absorb exports to achieve long-run economic growth as well as economic growth convergence amongst developed, emerging and developing economies (Todaro & Smith, 2003).

Owing to differences in economic growth theories and export theories, several studies (Abou-Stait, 2005; Olayiwola & Okodua, 2013; Hossein & Tang, 2014; Raheem, 2016; Bal, Mamun, Basher, Uddin & Mowla, 2019) have all tested the validity of the export-led growth hypothesis from different economies, however, all their economic growth have measured from the endogenous growth theories by examining both the short and long-run economic growth. However few studies (Abou-Stait, 2005; Bal, Mamun, Basher, Uddin & Mowla, 2019) have measured exports without disaggregation to test the export-led growth hypothesis but many studies (Usman, 2010; Olayiwola & Okodua, 2013; Oboro, 2021) have considered only non-oil exports to test export-led growth hypothesis and few studies (Hossein & Tang, 2014; Raheem, 2016) have measured exports from disaggregation approach into oil and non-oil exports to test export-led growth hypothesis in the literature. Importantly, the empirical studies are reviewed from non-Nigeria and Nigeria studies to test the validity of the export-led growth hypothesis. In the non-Nigeria studies, Abou-Stait (2005) employed Granger causality and impulse response functions (IPF) of the vector autoregressive (VAR) model. His findings revealed that exports granger caused GDP growth, domestic investment and net capital formation in Egypt for two disaggregated study periods, 1977-2003 and 1991-2003 respectively, which confirms the validity of the export-led growth hypothesis in Egypt. Also, the IPF found that shocks to exports lead to a significant response in GDP in Egypt within the study periods. Similarly, the study of Bal, Mamun, Basher, Uddin, & Mowla (2019) examined the export-led growth hypothesis in developing countries: Econometric evidence from Bangladesh for the study periods 1970 to 2010. Their study employed autoregressive distributed lags (ARDL), granger causality and Toda-Yamamoto causality. While the ARDL found that export has a positive long-run economic growth, the Granger causality and Toda-Yamamoto causality found a unidirectional and bidirectional causality, hence the study confirmed the validity of the export-led growth hypothesis in Bangladesh. Also, Hosseini & Tang (2014) examined the effect of oil and non-oil exports on economic growth: a case study of the Iranian economy. Their study employed a fully modified ordinary least square (FMOLS) and vector error correction model (VECM). While the FMOLS found that oil exports and non-oil exports have a negative and positive effect on economic growth respectively, the VECM found that there is a direction from oil export, and non-oil export to economic growth, hence, a unidirectional causality exists and

confirms the validity of export-led growth hypothesis in Iran. In the Nigeria studies, the study of Olayiwola & Okodua (2013) examined the relationship among FDI, non-oil exports, and economic growth in Nigeria: a causality analysis. They employed vector error correction model (VECM), and impulse response functions (IRFs) using variance decomposition. The IRF results found that shocks to non-oil export do not show an immediate response in GDP growth and implied that the export-led growth hypothesis (ELGH) is not valid in Nigeria. Unlike Raheem (2016) that examined the analysis of the effect of oil and non-oil export on economic growth in Nigeria between 1981 and 2015 and employed Granger causality. His findings found oil and no-oil exports have a negative and positive effect on economic growth in Nigeria as well as a unidirectional causality from oil export to GDPand also from non-oil to economic growth respectively in the short run while a bidirectional causality direction from oil export to GDP in this study. These results confirmed that the export-led growth hypothesis (ELGH) is valid in Nigeria. Though there are mixed findings on the validity test of the export-led growth hypothesis in Nigeria but other non-Nigeria studies all validated the export-led growth hypothesis in this study.

3. Theoretical Framework, Model Specification and Methodology

3.1. Theoretical Framework

To estimate the nexus between export and economic growth in Nigeria, this study drew a model specification from the Lucas growth model is one of the endogenous growth theories which accounted for the difference in the rates of output growth and per-capita income growth in the long-term due to endogeneity factors, that can either lead to increasing returns to scale or decreasing returns to scale, and not constant return to scale as assumed by the Solow growth model. Therefore, the aggregate Cobb-Douglas production function is expressed as:

$$Y_t = A_t K_t^{\alpha} (eHL)^{1-\alpha} \quad (2)$$

Where Y, A, and K are output levels, the index of technology determines the new knowledge and physical capital respectively while α is usually defined as $0 < \alpha < 1$ and the*e* is defined as the proportion of total labour time spent working, and H is what Lucas called the stock of "human capital". Further, the physical capital is decomposed into domestic capital and foreign capital and denoted as $K_d$and K_f and expressed in equation (3) as:

$$Y_t = A_t K_t^{\emptyset} K_t^{\beta} (eHL)^{1-\alpha} \quad (3)$$

Where $\propto = \emptyset + \beta$

Divide the equation by Labour (L) to obtain the per capita income growth in equation (4)

$$\frac{Y_t}{L} = A_t \frac{k_d^{\emptyset}}{L} \frac{k_f^{\beta}}{L} \left(e \frac{H}{L} \frac{L}{L}\right)^{1-\alpha} \quad (4)$$

Hence, the natural logarithm

$$y = Ak_d^{\emptyset} k_f^{\beta} eh^{1-\alpha} \quad (5)$$

Take natural logarithm to each term

$$In(y) = In(A) + Ink_d + Ink_f + (1-\alpha)In(e) + (1-\alpha)Inh$$

$$In(y) = In(A) + Ink_d + Ink_f + 1 - \alpha(1) + 1 - \alpha Inh \quad (6)$$

Where 1-α confirms the increasing returns to scale for the production function as theorized in the Lucas growth model in equation (1) and rewritten as equation (7):

$$In(y) = In(A) + \emptyset Ink_d + \beta Ink_f + (1-\alpha)In(h) \quad (7)$$

Where $1 - \alpha = \omega$

$$In(y) = In(A) + \emptyset Ink_d + \beta Ink_f + \omega In(h) \quad (8)$$

Furthermore, the other endogenous growth models, Romer (1986) and Rebelo (1991) argue that the technological change (A) will change depending on the kinds of externality of capital investment. In this study, A depends on the set of country's structural changewhich is exportsand another set of controlling variables that have direct and indirect effects on long-run economic growth. Importantly, equation (8) represents the Lucas endogenous growth framework that is used to achieve the causal effect of exports on economic growth in this study.

3.2. Model Specification

The model specification for exports–growth nexus adapted from the Lucas endogenous growth theory and the works of Hosseini & Tang (2014), to produce the functional relationship and mathematical equations below:

Y = f (X, K, MS, INF, EXCH) (9)

Where Y is the economic growth, X is the total exports, K is the total capital investment, MS is the money supply, INF is the inflation rate, and EXCH is the exchange rate. Further, the functional equation is disaggregated the exports into oil export and non-export to produce this functional equation as:

Y = f (DI, FDI, OX, NOX, MS, INF, EXCH) (10)

Where K is further decomposed into domestic capital and foreign capital as a domestic investment (DI) and foreign direct investment (FDI)and also X is further disaggregated into oilexports and non-oil exports, which are represented as OX and

NOX respectively. Further eq(10) Hence, the linear double–logarithm econometric model is used and expressed eq (10) into a linear double-logarithm model shown in eq (11):

$$In(Y) = \beta_0 + \beta_1 InOX_t + \beta_2 InNOX_t + \beta_3 InGFCF_t + \beta_4 InL_t + \beta_5 InINF_t + \beta_6 InEXCH_t + \beta_7 InM_t + \ell_t \quad (11)$$

Where In is denoted as the natural logarithm, Y represents the economic growth (gdpg) is the dependent variable while the independent variables are OX is the oil export, NOX is the non-oil exports, GFCF is the gross fixed capital formation which represents the stock of domestic capital investment, L is the size of labour, INF is the inflation rate, and EXCH is the exchange rate, M is the total imports and e is the disturbance term for non-included variables. In this study, the independent variables consist of main variables and controlled variables. While oil exports and non-oil exports are the main variables, the other controlled variables are derived from empirical studies. The t denoted the time series dataset employed in this study.

To estimate the short and long-run economic growth, it is imperative to conduct cointegration for all the included variables to determine the long-run association among the variables. Theoretically, there are different cointegration methods, ranging from Engle-Granger, Johansen and the recent, autoregressive distributed lag (ARDL) Bounds cointegration tests. In this study, the ARDL Bounds test is employed because the sample size is assumed to be small size, and the integrated order levels for the included were found to be mixed of integrated order of zero I(0) and integrated order one I(1). More importantly, the ARDL Bounds test is superior to other cointegration methods because it is applicable in the case of small sample size, reduces the parameter estimates to a single linear equation which are all the OLS assumptions and also, it imposes restrictions to the number of lag for each variable individually, unlike Johansen cointegration method (Pesara, Shin, & Smith, 2001). The ARDL Bounds test is applicable for series that are I(0) and I(1) or mutually cointegrated but none of them is I(2). The ARDL Bounds test is expressed in equation (12) as:

$$\begin{aligned}\Delta GDPG_t = {} & \beta_0 + \sum \beta_i \Delta GDPG_{t-1} + \sum \alpha_j \Delta OX_{J-1} + \sum \chi_k \Delta NOX_{k-1} + \sum \delta_l \Delta DI_{l-1} + \\ & \sum \phi_m \Delta FDI_{M-1} + \sum \varphi_n \Delta INF_{n-1} + \sum \gamma_o \Delta MS_{o-1} + \sum \eta_p \Delta EXCH_{p-1} + \lambda_1 GDPG_{t-1} + \lambda_2 OX_{t-1} + \lambda_3 NOX_{t-1} \\ & + \lambda_4 DI_{t-1} + \lambda_5 FDI_{t-1} + \lambda_6 INF_{t-1} + \lambda_7 MS_{t-1} + \lambda_8 EXCH_{t-1} + \varepsilon_t \qquad (12)\end{aligned}$$

The ARDL Bounds equation indicates that it is free from serial correlation and also stable to show the presence of long run cointegration relationship while the null hypothesis of no long-run cointegration when Ho: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = \lambda_8 = 0$, thus, the existence of long-run cointegration is when the null hypothesis is rejected.

Furthermore, the cointegrating regression and error correction model (ECM) for cointegrating variables in ARDL express the short-run ARDL or the ECM equation in eq(13) as:

$$\Delta GDPG_t = \beta_0 + \sum \beta_i \Delta GDPG_{t-1} + \sum \alpha_j \Delta OX_{J-1} + \sum \chi_k \Delta NOX_{k-1} + \sum \delta_l \Delta DI_{l-1} + \sum \phi_m \Delta FDI_{M-1} + \sum \varphi_n \Delta INF_{n-1} + \sum \gamma_o \Delta MS_{o-1} + \sum \eta_p \Delta EXCH_{p-1} + \lambda ECT_{t-1} + \varepsilon_t \quad (13)$$

Lastly, the long-run cointegrating regression model is expressed as :

$$GDPG_t = \lambda_1 + \lambda_2 OX_{t-1} + \lambda_3 NOX_{t-1} + \lambda_4 DI_{t-1} + \lambda_5 FDI_{t-1} + \lambda_6 INF_{t-1} + \lambda_7 MS_{t-1} + \lambda_8 EXCH_{t-1} + \varepsilon_t \quad (14)$$

This equation estimates the long-run ARDL which assumes, all things being equal, unlike the short-run ARDL which capture the dynamic OLS and the process of eliminating the errors to achieve the equilibrium state, which represents the export-led growth hypothesis (ELGH). According to the ELGH A Priori, oil exports and non-oil exports are expected to foster GDP growth, hence, the λ_2 and λ_3 coefficient values should be positive as well as domestic investment (λ_4), foreign direct investment (λ_5) and money supply ($\lambda 7$) while the inflation (λ_6) and exchange rate (λ_8) coefficients are expected to have negative signs to drives economic growth theoretically.

Finally, to test the validity of the export-led growth hypothesis (ELGH), this study estimates the Granger-causality test to verify if oil exports Granger cause GDP, and non-oil exports Granger cause GDP and vice versa respectively as expressed in equations15 -17 as follows:

$$\Delta GDP_t = \beta_o + \beta_1 \Delta GDP_{t-1} + \beta_2 \Delta OX_{t-1} + \beta_3 \Delta NOX_{t-1} + \varepsilon_t \quad (15)$$

$$\Delta OX_t = \beta_o + \beta_1 \Delta GDP_{t-1} + \beta_2 \Delta OX_{t-1} + \beta_3 \Delta NOX_{t-1} + \varepsilon_t \quad (16)$$

$$\Delta NOX_t = \beta_o + \beta_1 \Delta GDP_{t-1} + \beta_2 \Delta OX_{t-1} + \beta_3 \Delta NOX_{t-1} + \varepsilon_t \quad (17)$$

The reported F-Statistics are the Wald statistic for the joint hypothesis as:

$$\beta_1 = \beta_3 = \beta_3 = 0 \quad (18)$$

The first null hypothesis is that oil exports do not Granger cause GDP (Y). While the second null hypothesis is that non-oil exports do not Granger cause GDP(Y), the third null hypothesis is that oil exports do not Granger cause non-oil exports as shown in equations (15-17).

4. Methodology

This study employed annual time series that spanned from 1970 to 2021 in Nigeria. Table 1 shows the summary of the description of the variable used in this study.

Table 1. Summary of Variable Description

Variable	Symbol	Source of Data
GDP growth rate (%)	GDPG	CBN (2021)
Oil Exports in GDP (%)	OX	CBN (2021)
Non-oil Exports in GDP (%)	NOX	CBN (2021)
Gross Fixed Capital Formation in GDP (%)	GFCF (DI)	WDI (2020) & CBN (2021)
Foreign Direct Investment	FDI	WDI (2020)
Inflation rate (%)	INF	CBN (2021)
Exchange rate	EXCH	CBN (2021)
Broad Money in GDP (%)	MS	CBN (2021)

WDI represents World Development Indicators; CBN Statistical Bulletin
Source: Author compilation, 2023

5. Results

5.1. Descriptive Analysis

Table 2. Descriptive Statistics for Included Variables, 1970-2021

	RGDPG	OX	NOX	FDI	DI	INF	EXCH	MS
Mean	0.024198	6736011.	545252.58	1.36354	35.275568	13.455	137.42423	31.702
Median	0.042793	7191086.	133595.00	1.12000	26.166507	12.094	133.50009	15.900
Maximum	0.153292	1728195	3207100.0	3.17000	89.386136	50.466	399.96005	438.17
Minimum	-0.373992	7201.200	203.20000	0.10000	14.168730	5.3880	0.6700032	10.454
Std. Dev.	0.089913	6102968.	778221.43	0.88299	21.679420	8.2852	113.35458	75.762
Skewness	-2.898220	0.263807	1.861695	0.36174	1.030292	2.9573	0.5462028	5.2228
Kurtosis	13.68656	1.635859	6.283759	2.18990	3.160380	13.950	2.6469614	28.540
Jarque-Bera	190.9099	2.763208	31.83533	1.52377	5.517647	200.07	1.7023963	983.51
Probability	0.000000	0.251175	0.000005	0.46678	0.063366	0.0000	0.4269030	0.0000

			1690282	42.2700		417.12		982.77
Sum	0.750133	2.09E+089		0	1093.541	61	4260.150	36
Sum Sq.				23.3903		2059.3		172200
Dev.	0.242529	1.12E+15	1.82E+131		14099.91	41	385477.3	.1
Observation s	51	52	52	52	42	52	52	52

Source: Researcher extract from EViews 10, 2023

The result of Table 2 indicated the real GDP growth (rgdpg) proxy as economic growth has the lowest average value of 0.02 when compared with other included variables while the exchange rate has the highest average value of 137.42. Secondly, the standard deviations of the included variables are all different from zero, implying their actual values are different from their means in this study. Thirdly, the skewness values in Table 2 exhibited that all the variables are asymmetrically distributed except oil export (OX), foreign direct investment (FDI), and exchange rate (EXCH) which are symmetrically distributed in this study. Similarly, the Jarque Bera test confirmed that all the variables are not normally distributed, except OX, FDI, and EXCH which are normally distrusted respectively.

5.2. Time Series Preliminary Tests

The time series preliminary tests are conducted on the included variables to avoid spurious ordinary least squares. In addition, the time series preliminary tests are useful to test if the OLS results conform with the OLS assumptions. In econometrics, the time series preliminary tests employed are the unit root and the cointegration tests. While the unit root test is used to ascertain the mean and variance of each variable, whether each of the variable datasets is stationary or not, the cointegration test is used to test the joint stationary of all the included variables, whether the included variables have a long run equilibrium or not.

5.2.1. Unit Root Tests

This study employed Augmented Dickey-Fuller (ADF), Phillip-Perrron (PP)and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) unit root tests to ascertain each variable's stationarity. Table 3 presents the unit root test results for all included variables.

Table 3. Unit Root Test Results

Variables	ADF Unit Root Test		PP Unit Root Test		KPSS Unit Root Test		Order of Integration
	ADF @ level Value	ADF @ 1st Difference value	PP @ level Value	PP @ 1st Difference value	KPSS @ level Value	KPSS @ 1st Difference value	
RGDPG	-4.295***	-	-5.02***	-	0.221**	-	I (0)
OX	1.241	-7.21***	0.638	-6.190***	0.812	0.481***	I (1)
NOX	-0.76	-7.21***	-0.876	-12.79***	0.674***	-	I (1)
DI	-2.93**	-	-2.96**	-	0.646***	-	I (0)
FDI	-1.529	-3.85***	-2.51	-11.93***	0.284***	-	I (1)
INF	-3.53***	-	-3.36***	-	0.190***	-	I (0)
EXCH	-3.12	-4.60***	3.25	-4.56***	0.870	0.598***	I (1)
MS	2.13	3.51	0.29	2.76	0.463	0.356***	I(1)

*Note: ***, ** and * denote 1%, 5% and 10% levels of significance. The null hypothesis is rejected if the ADF and PP statistics are greater than critical values of 1%, 5% and 10% significant values respectively, while the KPSS variable is stationary when the KPSS coefficient is less than critical values of 1%, 5% and 10%.*

As shown in Table 3 all study variables are not stationary at level, except oil export (OX), non-oil exports (NOX), foreign direct investment (FDI), exchange rate (EXCH), and money supply (MS). However, none of the variables is of order two, *I* (2). In addition, all three unit root tests were all consistent in the order of integration of the variables.Therefore, the results are mixed level and first differencestationarity.

Table 4. ARDL Cointegration Bound Test

Variable	**F-statistic**	**Degree of Freedom (k)**	**Upper Critical Values**		
			10%	**5%**	**1%**
All variables	10.75	7	3.13	3.5	4.26

Source: Authors' computation, 2023 from EViews10

Table 4 found that all variables in the objective one and two models have a long-run relationship because the F-statistics value is greater than the critical values of 10%, 5% and 1% respectively within the study period (1970-2021), hence, the null hypothesis of no long run relationship cannot be accepted and thus, accept the alternative hypothesis of long-run relationship exists among the joint variables in objective one and two models in this study.

5.2.3. VAR Lag Length Test

Since the autoregressive distributed lag (ARDL) estimation model is dynamic, it is essential to determine the optimal lag length for both the regressands and regressors to achieve efficient and unbiased estimated OLS.

Table 5. VAR Lag Length Test for the Study Variables

Lag	log L	LR	FPE	AIC	SC	HQ
0	-3229.895	NA	1.07e+58	161.9947	162.4170	162.1474
1	-2906.979	468.2277*	1.78e+53*	150.8490*	155.4934*	152.5282*

Source: Authors' computation, 2023 from EViews10

Table 5 displayed the six lags selection criteria used in this study. As shown in Table 5, the optimal lag length for the included variables is a lag one. In addition, five out of six lags selection criteria (LR, FPE, AIC, SC and HQ) jointly satisfy the optimal lag length of one for all study variables in this study.

Table 6. ARDL OLS Short-Run and Long-Run Estimate

PANEL A: ARDL OLS Short-run Cointegrating Form		
Variable	**Coefficient**	**Prob.**
D(OX)	-1.49E-08	0.0862***
D(NOX)	3.09E-08	0.0637***
D(DI)	-0.005359	0.0000*
D(FDI)	-0.004638	0.7117
D(INF)	-0.001363	0.0524***
D(MS)	0.005978	0.0435**
D(EXCH)	-0.001226	0.0339**
CointEq(-1)	-1.196048	0.0000
PANEL B: ARDL Long-run Estimate		
Variable	**Coefficient**	**Prob.**
OX	-1.42E-08	0.0014*
NOX	3.09E-08	0.0680***
DI	-0.004480	0.0000
FDI	0.006262	0.5102
INF	-0.001140	0.0555***
MS	0.004998	0.0475**
EXCH	-0.000114	0.6072
C	0.197536	0.0003*

Source: Authors' computation, 2023 from EViews10

Table 6 presents the short-run and long-run OLS regression results for the relationship between oil export, non-oil export and economic growth in Nigeria over the study period, 1970 to 2021. First, the short OLS results revealed all the changes in the included variables except foreign direct investment (FDI) significantly cause a change in the economic growth within the study periods, from 1970 to 2021 in

Nigeria. In specific, the result found that both changes in oil export and non-oil export lead to a very low negative and positive significant impact on the changes in economic growth respectively. This result indicated that changes in oil exports have resulted in a decline change in economic growth and thus it supports the DutchDisease witnessed in Nigeria because as the oil export increases, the economic growth retards continually over the study periods. While the changes in non-oil export showed a positive change in economic growth, unlike the changes in oil export, and thus, this supports the importance of diversification's role in economic growth, which is an example of the East Asian Tiger economic growth performance. The results that change in oil export and non-oil export have negative and positive effect changes on economic growth in Nigeria, which is in line with the study of Raheem (2016). More importantly, the error correction term (ECT) value of -1.196 conforms to the expected negative and statistically significant at a 1% level, which implies that the speed of error term recovery or disequilibrium adjustments will take place at the rate of 1.20% to the long run equilibrium in this study.

On the long run OLS estimates, the results revealed that all the study variables except FDI and exchange rate (EXCH) have a significant effect on long-run economic growth in Nigeria. Specifically, while oil exports have a very low negative significant effect on economic growth, non-oil exports showed a very low positive significant effect on long-run economic growth within the study period, 1970 to 2021, in Nigeria. In addition, the coefficient value of 0.197 indicated that oil exports, non-oil exports and other controlled variables are weak determinants of economic growth in Nigeria, and specifically about 80% of other variables not included in this model determine long run economic growth in Nigeria.

Table 7. Results from Granger Causality Test for Oil Export, Non-Oil Export and Economic Growth in Nigeria

Pairwise Granger Causality Tests Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
OX does not Granger Cause RGDPG	49	0.14381	0.8665
RGDPG does not Granger Cause OX		0.03174	0.9688
NOX does not Granger Cause RGDPG	49	0.12644	0.8815
RGDPG does not Granger Cause NOX		0.02887	0.9716

NOX does not Granger Cause OX	50	13.8827	2.E-05
OX does not Granger Cause NOX		18.7708	1.E-06

Source: Authors' computation, 2023 from EViews10

As shown in Table 7, there is a Granger causality test between two variables and not among the three variables, oil export, non-oil export and economic growth within the study period. Specifically, Table 7 found that only oil export and non-oil export have significant bidirectional causality at a 1% level of significance while other bidirectional causality between oil exports and economic growth as well as non-oil export and economic growth are not statistically significant in this study. This study inferred that neither oil export caused economic growth nor non-oil export caused economic growth within the study periods, 1970 to 2021 in Nigeria. Therefore, there is no unidirectional causal relationship from exports to economic growth, hence, the export-led growth hypothesis (ELGH) is not valid in Nigeria within the study periods of 1970 to 2021. These findings are similar to Olayiwola and OKodua (2013) that found that the export-led growth hypothesis is not valid in Nigeria but, in contrast to the study of Raheem (2016) found that the export-led growth hypothesis (ELGH) is valid from 1981 to 2015.

Table 8. Post Estimation Diagnostic Tests Results

Test	**Coefficients**	**Critical Value**	**OLS Assumptions' Decision**
Breusch-Godfrey LM	0.4961	0.05	No Serial Correlation
Variance-Inflation Factor (VIF)	1.20	10	No Multicollinearity
ARCH	0.864	0.05	No Heteroskedasticity
Ramsey Reset	0.9041	0.05	Model Stability
Residual Stationarity	-6.793	0.05	Normal Distribution

Source: Authors' computation, 2023 from EViews10

Table 5 presents the diagnostic results from the ARDL to confirm the linearity regression assumptions that guarantee a long-run cointegration relationship and to make future predictions of the model. In specific, Table 5 found that the ARDL model is free from serial correlation, multicollinearity, and heteroskedasticity and above all, the ARDL model is stable and reliable because all the diagnostic test coefficients are all greater than the critical values of 5 percent in this study.

6. Conclusion and Further Directions of Research

This study concluded that the export-led growth hypothesis (ELGH) is not valid from the Granger causality test result because the unidirectional causal relationship from oil and non-exports to economic growth was not statistically significant at either 1% or 5% in Nigeria over the study periods of 1970 to 2021. Furthermore, the results from the ARDL cointegration regression found that oil exports and non-oil exports have negative and positive significant effects on economic growth in the short run and long run at 1% and 10% respectively. More importantly, the short-run deviation in this model can be adjusted to the long-run equilibrium at 119.6% per period. In line with the aforementioned inference, the recommendations are as follows: First, the export drive policies should be continuous to improve and strengthen the oil exports and non-oil export sectors to have a higher positive and multiplier effect on economic growth. Second, there should be concerted efforts through government investment and economic policies to attract domestic investment and foreign direct investment to drive direct economic growth and indirectly promotes oil and non-oil exports in the country, Nigeria. Lastly, there is a need for an expansionary money supply to enhance economic growth through oil and non-oil export promotion in Nigeria. Besides, these recommendations, future studies should consider other endogenous factors that can concurrently enhance oil exports and non-exports through interactive effects and also the effects of non-disaggregated exports on economic growth to re-assess the validity of the export-led growth hypothesis in Nigeria.

References

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

Ali, F. (2011). Essays on foreign direct investment, institutions, and economic growth. *PhD thesis*: 209. University of Glasgow, Glasgow, UK.

Bal, H., Mamum, A. H., Basher, S., & Uddin, M. R. (2019). Export-led growth hypothesis in developing countries: Econometric evidence from Bangladesh. *Academic Review of Economics and Administrative Sciences, 12*(4), pp. 454-465.

Benli, M. (2020). Export diversification and economic growth: *Evidence from Emerging Economies.*

Danladi, A. & Naankiel, P. W. (2016). *Structural adjustment programme (SAP) and its implications on Socio-economic development, 1980-1995.* Retrieved from http:www.researchgate.net/publication|318755508.

Heckscher, E. F. & Ohlin, B. G. (1991). *Heckscher Ohlin trade theory*. The MIT Press.

Hosseini, S. M. P., & Tang, C. F. (2014). The effects of oil and non-oil exports on economic growth: A case study of the Iranian economy. *Economic Research-Ekonomska Istrazivanja, 27*(1), pp. 427-441.

Jhingan, M.L. (2010). *The economics of development and planning (39th ed.)*. Delhi: Vrinda Publications (P) Ltd.

Kemp, M.C. (1964). *The theory of international trade*. London: Prentice Hall.

Klein, N. (2010). The linkage between the oil and non-oil sectors: A panel VAR approach. *IMF Working Paper*, No. 10/118.2. Retrieved from www.econbiz.de/Record/the_linkage_between_the_oil_and_non-oil_sectors_a_panel_var_approach.

Kodiyat, T.P. (2009). Foreign direct investment from developing countries: A systematic review. *MRes Dissertation* @ Cranfield University.

Kurtishi-Kastrati, S. (2013). Impact of FDI on economic growth: An overview of the main theories of FDI and empirical research. *European Scientific Journal*, *9*(7), pp. 56-77.

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22.

MacDougall, G. (1960). The benefits and cost of private investment from abroad: A theoretical approach. *Economic Record*, 36, pp. 13-35.

Mankiw N.G.; Romer D. & Weil D.N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, *107* (2), pp. 407-437.

Masoud, N. (2014). A contribution to the theory of economic growth: Old and new. *Academic Journals*, *6*(3), pp. 47-61.

Morenop-Bnd, J. C.; Valdivia, J. C. R. & Santamaria, J. (2005). Mexico: Economic growth, exports and industrial performance after NAFTA. *Estudios Perspectivas*, 42, pp. 1-36.

National Centre for Economic Management and Administration (NCEMA) (2013. Structural adjustment programme in Nigeria causes, processes, and outcomes. *Revised Technical Proposal Submitted to Global Development Networks (GDN).* Retrieved from nairametircs.com/wp_content/uploads/2013/04/Nigeria_proposal.

Nayak, D. & Choudhury, R.N. (2014). A selected review of foreign direct investment theories. Asia-Pacific Research and Training Network on Trade (ARTNet). *Working Paper Series* No. 143. Available at www.artnetontrade.org.

NBS (2023). *National Bureau of Statistics*. Retrieved from htttp:// www.nbs.org.com.

Oboro, O. G. (2021). Non-oil exports and the growth of the Nigerian economy. *A PhD dissertation* @Igbinedion University, Okada, Edo State.

Ogunsawo, O. F.; Obisesan, O. G. & Olowo, S. O. (2020). Short-run and Long-run effects of non-oil trade export on economic growth in Nigeria. Acta Universitatis Danubius. *OEconomica Danubius University of Galati, issue 16*(2), pp. 239-254.

Olayiwola, K. & Okodua, H. (2013). Foreign direct investment, non-oil exports, and economic growth in Nigeria. A causality analysis. *Asian Economic and Financial Review*, *3*(11), pp. 1479-1496.

Palley, T. I. (2012). The rise and fall of export-led growth. *Investigacion Economica*, *71*(280), pp. 141-181.

Pesaran, M. H.; Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), pp. 289-326.

Raheem, I. A (2016). *Analysis of the effects of oil and non-oil export on economic growth in Nigeria*. Retrieved from https://hal.archives-ouvertes.fr/hal-01401103v2.

Rebelo, S. (1991). Long-run policy analysis and long-run growth. *The Journal of Political Economy, 99* (31), pp. 500-521.

Riti, J. S., Gubak, H. D., & Madina, D. A. (2016). Growth of non-oil sectors: A key to diversification and economic performance in Nigeria. *Public Policy and Administration Research, 6*(3), pp. 64-75.

Sanusi, S. L. (2010). *Growth Prospects for the Nigerian economy*. Retrieved from cbn.gov.ng|out/speeches/2010/gov-convocation_Lecture_Igbinedion_University_Okada.

Subaset, T. (2000). Export-led development: A theoretical and empirical investigation. *A PhD Thesis submitted @school of oriental and African Studies University of London*. United States: ProQuest.

Subaset, T. (2002). Does export promotion increase economic growth? Some Cross-section evidence. *Development Policy Review* 20, pp. 333-349.

Todaro, M.P. & Smith, S.C. (2003). *Economic Development (8th ed.).* London: Pearson Education Limited.

Ugwuegbe, U. S. & Chinyere, U. P. (2013). The impact of export trading on economic growth in Nigeria. *International Journal of Economics, Business and Finance, 1*(10), pp. 327-341.

Usman, F. (2010). Non-oil export determinants and economic growth in Nigeria (1985-2008). *European Journal of Business and Management Sciences,* 3, pp. 124-146.