

## Export and Economic Growth Nexus in Nigeria

Christopher Ehinomen<sup>[a]</sup>; Oguntona Olalekan Daniel<sup>[a]</sup>

<sup>[a]</sup> Department of Economics and Business Studies, Redeemers University, Redemption City, Ogun State, Nigeria.

\* Corresponding author.

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### Abstract

This study examines the export and economic growth nexus in Nigeria. The study sets out to examine if there exist a causal and long-run relationship between export and economic growth in Nigeria. The underpinning theoretical framework dwell in classical economic growth thought, neo-classical economic growth thought, and endogenous economic growth thought. The study employed the annual time series data from 1970 to 2010 for the following variables: Real gross domestic product (y), export values (expo), exchange rate (exr), imports value (imp), gross capital formation (cap), and labour force population (lbr); using econometric procedures in testing for causality with the use of granger causality test and autoregressive distributed lag (ARDL) to ascertain if there exists a long-run relationship. The results obtained indicated that there exist a uni directional relationship between export and economic growth; while the results of the ARDL showed a co-integration (long-run relationship) between export and economic growth in Nigeria. The policy implication as evidenced from the results of the study is that the government should endeavour to invest more into the export sector, promote diversification of the economy from its over dependence on crude oil, facilitate proper machineries and provide infrastructures to support and motivate export activities, which will ultimately by multiplier effect, lead to economic growth. Export policies should be directed to the sector in which the impact of an increase in economic growth will be both desirable and large.

**Key words:** Nigeria; Export; Economic growth; Causality; Co-integration; Infrastructure; Economy diversification

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### INTRODUCTION

The performance of a given economy in terms of growth rate of output and per capital income has not only been based on the domestic production and consumption activities but also on international transaction of goods and services (Azu, 2008). Indeed it has been generally acknowledged that foreign trade is an engine for growth and development (Adewuyi, 2002).

The term export is derived from the conceptual meaning as to ship the goods and services out of the port of a country (Wikipedia). According to (investopedia) export is a function of international trade whereby goods produced in one country are shipped to another country for future sale or trade. The sale of such goods adds to the producing nations gross output. Generally, it can be argued that export is an engine of growth, a potent strategy for mutual inter-dependence among world nations and an instrument for technological and industrial emancipation. Export is a catalyst necessary for the overall development of an economy (Abou-Stait, 2005). In a world where globalization and economic integration is fast eroding distance and barriers, a country cannot afford to be in an autarky position (a state of self sufficiency) if indeed it must achieve the status of a developed nation. Exports help in increasing the level of aggregate economic activities through its multipliers effects on the level of national income (Usman & Salami, 2008). Exports have also been described as the bedrock of any economic development (bright C opera, 2010). Furthermore, a well developed export sector will provide employment opportunity for the people with the attendant

reduction in social costs of unemployment. Earnings from export will reduce the strains on the balance of payment position and even improve it. A rewarding export drive can turn a hitherto underdeveloped economy into a prosperous economy. Therefore, the role of export in economic performance of developing countries like Nigeria has become one of the more intensively studied topics in recent years.

In Nigeria, Economic growth has been an issue of pursuit of the federal government over the past 50 years. Several administrations, regimes, policies, programs, and steps have been undertaken in order to achieve the status of a developed economy with varying degrees of success and failures. Despite this, the Nigerian economy has remained a developing one with its vast array of resources she is endowed with. In the period 1960-70 GDP recorded an average of 3.1 percent growth annually. In the oil boom era between 1970-78, GDP grew positively by 6.2 percent annually, a remarkable growth. However in 1981 the GDP had a negative growth rate of -4.1%. Therefore, this research seeks to find out if there is a causality effect between export and economic growth in Nigeria. In other words, does export led to economic growth or are they bidirectional and also to what extent can this relationship be qualified.

This study comprises of the introduction which gives an insight into the study, an over-view of the Nigerian export sector, the review of relevance studies including some theoretical frameworks, the tools of data collection and analysis, the presentation and analysis of data, and the discussion of results, conclusions and recommendations offered.

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## **AN OVERVIEW OF THE NIGERIAN EXPORT SECTOR**

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The Nigerian export sector has been a vibrant one ever before independence. Indeed, Nigeria is a country endowed with enormous resources. Nigeria is the 6<sup>th</sup> largest producer of crude-oil in the world and 2<sup>nd</sup> in Africa, 3<sup>rd</sup> largest producer of cocoa in Africa, the world largest producer of cassava, enormous deposits of solid minerals such as gold, tin, copper, coal, limestone, columbite, iron-ore, marble emerald, etc.. In the 1960's, Nigerian exports trade was largely dominated by non-oil products such as ground nut, palm kernel, palm oil, cocoa, rubber, cotton, coffee, copra, beniseed, and other non-oil exports of significant value. There were also tin-ore, columbite, hides, skin, and cattles. Over 66 percent of total exports on the average were accounted for by those commodities. Agricultural exports accounted for 70.8 percent of total exports while petroleum accounted for only 2.6 percent. The same pattern continued into the early 1970. Government revenues also depended heavily on taxes on those exports. As a result, the 1<sup>st</sup> and 2<sup>nd</sup>

national development plans were largely financed by non-oil exports with a growth rate of 5 percent and 11 percent achieved respectively. However oil dominance of the country economic export basket began with the positive oil shock of 1973-1974. Agricultural exports accounted only for 33 percent of total exports while petroleum exports had started to establish dominance by exceeding 58 percent of total export. By 1979, the petroleum exports accounted for approximately 93 percent of all exports which brought about a large receipt of foreign exchange breathed a paradigm shift of emphasis to the oil exports and a decline of the agricultural sector with a relative share of agricultural export in total export shrinking to about 5.4 percent.

The oil boom afflicted the Nigerian economy with the so called "Dutch disease" a phenomenon used to analyze the effects of commodity booms that are traditionally evaluated in terms of "spending" and "resource movement" effects (Harberger, 1983). The crux of the matter was that while oil exports were growing positively, non-oil exports were declining negatively making the dominance more rapid and pervasive. Consequently, the 4<sup>th</sup> national development plan which was planned upon estimates from projected revenue from crude oil suffered a set back due to the oil glut in the international market beginning in 1982 which necessitated a change of plan and the introduction of the structural adjustment program (SAP) in 1986. Under SAP, emphasis were on diversifying Nigeria's export base away from crude oil and increasing non-oil foreign exchange earnings. To achieve the objectives of this program, the government put in place sequentially a number of policy reforms and incentives to encourage the production and export of non-oil products as well as broadening Nigeria's export market. They include:

Export development fund (EDF); a special fund provided by the government to finance assistance to exporting companies to cover part of their export promotion activities such as export market, research studies, product design etc..

Export expansion grant fund (EEGF); designed to provide cash inducement to exporters who attain a minimum annual export turnover. This inducement was to enable them to achieve increased volume of the export and diversify their export product.

Duty drawback/suspension scheme; where exporters can import raw material free of import duty or other indirect taxes and charges.

Tax relief and interest income; this relief exempts from tax the interest income that accrue to banks from export lending activities to provide credit support to the export sector etc..

With the return to democratic rule in 1999, the government starting from 2001 introduced economic reforms. In 2003, the reform program was formulated and systematized and government began to implement

a comprehensive reform program known as NEEDS (national economic and empowerment development strategy). A major thrust of NEEDS is to promote an export led growth strategy that will take advantage of globalization and the external trade opportunities with regional and international trade/economic integration arrangements; designed to encourage the growth of industries whose growth had hitherto been hampered by narrow domestic market opportunities, promote technological innovation and diversify the resources of foreign exchange earnings.

The democratic government of shehu musa yar'dua came up with another strategic goal; vision 2020 which aims to launch Nigeria into the league of the top 20 economies by the year 2020. Key goals for vision 2020 includes with particular emphasis to; A sound stable and globally competitive economy with a GDP of not less than 900 billion dollars and a per capita income of not less than 4000 dollars per annum. A modern technologically enabled agricultural sector that fully exploits the vast agricultural resources of the country ensures national food security and contributes significantly to foreign exchange.

Domestic export has always dominated external trade between 1987 and 2006 averagely accounting for about 93.93 percent of total domestic export. On the other hand, non-oil export accounted for a small value of 6.67 percent over the same period. For the year 2007, export declined slightly to about ₦6.8bn from ₦7.5bn representing 62.5 percent in 2007 as against 72.1 percent in 2006 export in relation to total trade. Year 2008 witnessed an improvement in the revenue generation of export as it increased to about ₦9.5bn with export accounting for 74.4 percent of total trade. The value of total export declined in 2009 by 31.7 percent to ₦6.7716bn. The bulk of the export proceeds were accounted for by crude-oil and gas (95.8 percent), while non-oil export accounted for 4.2 percent.

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## LITERATURE REVIEW

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Lipsey (1986) defined economic growth as the positive trend in the nations' total output over a long period of time. Jhingan (1997) quotes Kuznets (1966) in defining economic growth as a long term rise in capacity to supply increasingly diverse economic goods to its population, with the growing capacity based on advancing technology and institutional and ideological adjustments that it demands. Todaro and Smith (2009) opined that it is the steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national output and income. It is this sustained growth that leads to economic development.

Investment is the most fundamental determinant of economic growth identified by both neoclassical, predicated upon the Solow growth model and endogenous growth model developed by Romer and Lucas. However in the neoclassical model investment has impact on the

transitional period. While the endogenous growth models argued for more permanent effects. The importance attached to investment by these theories has led to an enormous amount of empirical studies examining the relationship between investment and economic growth.

Economic policies and macroeconomic conditions have, also, attracted much attention in terms of its role to economic performance (Kormendi & Meguire, 1985; Barro, 1991, 1997; Fischer, 1993) since they set the framework within which economic growth occurs. Sound macroeconomic conditions are seen as necessary, though not sufficient, conditions for economic growth (Fischer, 1993).

Foreign Direct Investment (FDI) has recently played a crucial role of internationalising economic activity and it is a primary source of technology transfer and economic growth. This major role is stressed in several models of endogenous growth theory. (e.g. Lensink, 2000; Lensink & Morrissey, 2006).

Another important source of growth highlighted in the literature is the institutional framework. Although the important role institutions<sup>1</sup> play in shaping economic performance has been acknowledged long time ago (Lewis, 1955; Ayres, 1962). It is on these grounds that Easterly (2001) argued that none of the traditional factors would have an impact on economic performance if there were no stable and trustworthy institutional environment to sustain the economy. The relationship between political factors and economic growth has come to the fore by the work of Lipset (1959) who examined how economic development affects the political regime. Since then, research on these issues has proliferated, making clear that political issues affect to a great extent, the economy and its potential for growth (Kormendi & Meguire, 1985; Lensink, 2001).

Recently there has been a growing interest in how various social-cultural factors may affect growth (see Huntington, 1996; Temple & Johnson, 1998; Landes, 2000; Zak & Knack, 2001; Barro & McCleary, 2003).

Ethnic diversity, in turn, may have a negative impact on growth by reducing trust, increasing polarization and promoting the adoption of policies that have neutral or even negative effects in terms of growth (Easterly & Levine, 1997). This includes other social-cultural factors such as diversity in language or in religious beliefs, attitudes and the like.

There have been a number of recent empirical studies (Masters & McMillan, 2001; Armstrong & Read, 2004) affirming that natural resources, climate, topography and "landlockedness", etc. have a direct impact on economic growth affecting (agricultural) productivity, economic structure, transport costs and competitiveness.

Openness to trade is another important determinant of economic performance. There are sound theoretical reasons for arguing that there is a strong and positive

link between openness and economic growth: openness facilitates the transfer of technology and the diffusion of knowledge, and, by increasing exposure to competition, contributes to exploitation of comparative advantage. (e.g. Dollar & Kraay, 2000).

## THEORETICAL FRAMEWORK

Several authors have contributed and postulated various theories to give concise definition and explanation into the subject matter of economic growth. In view of this, we can generally classify this section into three main schools of thought as follows:

### Classical Economic Growth Thought

A characteristic feature of the classical approach is the view that production involves labour, induced means of production and natural resources. Adam Smith considered as the father of the classical, viewed the growth process as strictly endogenous with emphasis on the impact of capital accumulation and labour productivity. His conviction is that the key to the growth of labour productivity is the division of labour which in turn depends on the extent of the market, and hence, upon capital accumulation. Ricardo was of the view that as capital accumulates and population grows, assuming the constant real wage rate of workers, the rate of profit is bound to fall due to the intensive and extensive diminishing returns on land. Ricardo treated technological progress as largely exogenous contrary to Smith's opinion of it being endogenous, stressing that technological progress can take several forms associated with different implications for the performance of the system, its growth, and employment. This theory of comparative advantage would be the central theme for arguments in favour of free trade as an essential component of growth.

### Neo-Classical Economic Growth Thought

Neo-classical economists tend to concentrate on the short run economic process giving the central role in growth to technology. Thus the neoclassical theory of growth is considered as an exogenous growth model. Harrod-Domar in an attempt to analyze the requirements of steady growth in an economy postulated models of economic growth based on the experiences of advanced capitalist economy. Harrod and Domar were both interested in discovering the rate of income growth necessary for a smooth and uninterrupted working of the economy, assigning an important role to investment in the process of economic growth. Robert Solow (1988), a pioneer in constructing the basic neoclassical model, introduced the neoclassical principle of substitution between the factors of production within the growth theory. This principle enables investment to adjust to savings that corresponds to full capacity utilization. Solow explains in his model that with variable technical coefficient there would be a tendency

for capital-labour ratio to adjust itself through time in the direction of equilibrium ratio. If the initial ratio of capital to labour is more, capital and output would grow more slowly than labour force and vice versa. Mathematically Solow's growth can be represented thus;

$$Y = Af(L, K)$$

The growth model uses a standard aggregate production function in which

$$Y_t = A_t K^\alpha L_t^{1-\alpha}, 0 < \alpha < 1$$

### Endogenous Economic Growth Thought

The endogenous or new growth model was developed in the 1980s as a response to criticism of the neoclassical growth model. The endogenous growth theory holds that policy measures can have an impact on the long run growth of an economy. The neo-classical model predicts that countries with low per capita income grow faster than those with high income so that over time per capita income converges. The key to endogenous growth models is the inexistence of diminishing returns to the inputs that can be accumulated. Crucial importance is given to the production of new technologies and human capital.

### Export Led Growth

In the theoretical growth model, exports are considered as an umpire for growth. Firstly, export being a component of GDP, the increase of exports directly increases GDP. An increase in export means increase in employment in export sector industries which in turn increases income and GDP. Secondly, export supports foreign exchange earnings which also assist in importing capital goods, imports of capital goods and intermediate goods which stimulate domestic growth (Awokuse, 2005). Thus, export growth is one of the key determinants of economic growth. It holds that the overall growth of a country can be generated not only by increasing the amounts of labour and capital within the economy but also by expanding exports such that exports can perform as an engine of growth according to its advocates. Export and economic growth association is often attributed to the possible positive externalities beneficial to the domestic economy arising from world market participation.

### Empirical Studies on the Export Led Growth

Some empirical studies have reported a significant and positive relationship between exports and growth while others have given account of no significant relationship between export and growth. Boame (1998) recognized export proceeds as the main source of foreign exchange and its contribution as substantial to the economy of Ghana. Having recognized its export to comprise basically primary products notably cocoa, gold, diamonds, bauxite, manganese with a comparative advantage in such primary products, investigated empirically the causal relationship between GNP growth and export growth for Ghana from 1960-1992. He performed the granger causality test for

Ghana and indicated export growth as a growth of real GNP of the country.

Awokuse (2003) re-examined the export-led growth hypothesis for Canada by testing for Granger causality from exports to national output growth using vector error-correction models (VECM) and the augmented VAR methodology. Application of recent developments in time series modelling and the inclusion of relevant variables omitted in previous studies helped to clarify the contradictory results from prior studies on the Canadian economy. The empirical results suggested that a long-run steady state exists among the model's six variables and that Granger causal flow is unidirectional from real exports to real GDP. Musonda, I. (2007) examined the validity of the export led growth for Zambia, and employed secondary annual time series data for the period 1970-2003. He identified zambia's export as an important role and source of budgetary revenue with export primarily dependent on copper which accounts for over 50 percent of its export structure.

Andre and Joel (2007) investigated the causal relationship between export and economic growth for Botswana, using quarterly data for the period 1995.1-2005.4 with two measures of economic growth namely GDP and GDP excluding export. The author employed the methodology of augmented dickey-fuller (ADF) statistics to test the stationarity or non-stationarity of the variables and their order of integration, vector correction mechanism specification for auto correlation and endogeneity. The results suggested that the variables were moving together in the same direction with all variables stationary, and that export and GDP is also associated with an increase in export.

Abdus (2011) motivated by the mixed empirical evidences and non consensus on the causal relationship between export and economic growth based on past cross-sectional. Balassa (1988), Moschos (1989) and Grabowski (1990) studies undertaken in 9 Middle East North African (MENA) countries, singled out Algeria been a member of the 10 MENA countries to investigate the relationship between export and economic growth, with the objective of contributing to the existing debate. The author identified Algeria as oil endowed nation which contributes significantly to the country's export and about 48% of its GDP in 2006. He incorporated three distinct variables; Real per capital non-export GDP, export of goods and services, imports of goods and services and explored their interrelationship through the application of johansen co-integration VECM and granger causality/block exogeneity wald test as his methodology to establish stationarity and co-integration. The results found causality between economic growth, export and import. Thus, lending support to previous findings of many authors such as Balassa (1988), Moschos (1989), that export leads to economic growth.

## RESEARCH METHODOLOGY

Hypotheses:

Hypothesis 1 ( $H_1$ ): Export does not cause Economic Growth in Nigeria.

Hypothesis 2 ( $H_2$ ): Export causes Economic Growth in Nigeria.

Hypothesis 3 ( $H_3$ ): There is a significant long-run relationship between export and economic growth in Nigeria.

## RESEARCH DESIGN

The unit root test consisting of the Augmented Dickey Fuller (ADF) and the Phillip Perron (PP) test are made use of in this study. The second stage investigates the possible existence of a long-run relationship between the variables via a co-integration analysis. We explore the causality test which tries to explain the causal relationship between the time series variables.

### Unit Root Test

A unit root test is a test to determine the order of integration of the variable. When using the ADF (augmented dickey fuller) methodology, it is important that the error terms are uncorrelated and that they really have a constant variance. The Phillip and Peron (1985) modification of the ADF t-statistics comes into play as it takes into account the less restrictive nature of the error process. The ADF test is predicated on  $H_0$ :  $X_t$  is not 1(0) given by the equation below.

$$\Delta Y_t = \sum_{i=1}^p \beta_i \Delta Y_{t-i} - \alpha + \epsilon_t \quad (1)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^p \beta_i \Delta Y_{t-i} + \epsilon_t \quad (2)$$

Where  $Y_t$  denotes the variable time series,  $t$  is linear time trend,  $\Delta$  representing the difference operator  $\alpha_0$  and  $\alpha_1$  and  $\beta_1$  are parameters to be estimated;  $\epsilon_t$  is the white noise. The test regression

$$\Delta Y_{t-1} = \alpha_0 + \alpha_1 Y_{t-1} + \epsilon_t \quad (3)$$

The test based on the null hypothesis ( $H_0$ ) is:  $Y_t$  is not 1(0). If the calculated ADF and PP statistics are less than their critical value from the fullers table, then the null hypothesis ( $H_0$ ) is rejected and the series are integrated of the order one i.e. 1(1) to achieve stationarity.

### Cointegration

This study also proceeds into testing the cointegration (long-run relationship) among the variables after the direction of causality has been determined using the Auto Regressive Distributive Lag (ARDL) developed by Pesaran and Shin (1999) and later extended by the Pesaran *et al.* (2001). The ARDL proffers distinct econometric advantages when in comparison with other single cointegration techniques. Basically, it is not restrictive and allows testing for cointegration irrespective of whether

underlying regressors are purely integrated of zero order [1(0)] order 1 [1(1)] or co-integrated. It is not sensitive to the size of the sample, thereby making the small sample properties of the ARDL approach superior to multivariate co-integration. It is equally appropriate in the analysis of models based on small datasets. Also, the bound testing approach generally provides unbiased long-run and valid t-statistics even where some of the model regressors are endogenous.

$$\Delta Y_t = \alpha_0 + \beta_0 Y_{t-1} + \sum_{j=1}^k \beta_j X_{t-1} + \sum_{i=1}^k \beta_i \Delta Y_{t-1} + \sum_{i=1}^k \beta_j \Delta X_{t-1} \quad (4)$$

### Causality Test

Causality in econometrics refers to the ability of one variable to predict (and therefore cause) the other. It is possible to have

- (a)  $Y_t$  causing  $X_t$  or
- (b)  $X_t$  causing  $Y_t$
- (c) There is a bi-directional causality among the variables
- (d) The two variables are independent.

Therefore to discover an appropriate procedure that allows the testing and statistical detection of the cause and effect relationship among variables two approaches were proposed – the granger causality and Sims causality test.

Granger (1969) developed a relatively simple test that defines causality as follows;  $Y_t$  is said to granger cause  $X_t$  if  $X_t$  can be predicted with greater accuracy by using past values of the  $Y_t$  variable rather than not using such past values, all other terms remaining unchanged. Granger causality test for the case of two stationary variables  $Y_t$  and  $X_t$  involves a first step estimation.

### MODEL SPECIFICATION

Following the Solow's model (1957) which assumed that output (Y) depends positively capital (CA) and labour (LB) then the proceeding equation is

$$Y = f(CA, LB)$$

However for the purpose of our analysis on Nigeria, we include some other macroeconomic variables that have been considered to improve and influence the productivity of the country. Therefore, the variables considered includes Export (EX), Import (IM), Exchange rate in real terms (EXR), Labour stock (LB) measured in terms of labour force and Capital stock (CA) measured by gross capital formation.

$$Y = f(EX, IM, EXR, LB, CA) \quad (5)$$

In an explicit and econometric form equation (5) can be stated as

$$Y_t = \alpha_0 + \alpha_1 EX_t + \alpha_2 IM_t + \alpha_3 EXR_t + \alpha_4 LB_t + \alpha_5 CA_t + u_t \quad (6)$$

**Table 1**  
**Aprior Expectation**

Variable	Expected sign	Expected result
EXPORT	POSITIVE (+)	It is expected that the relationship between export and GDP to be positive as increase in export will lead to increase in GDP
IMPORT	POSITIVE (+)	It is expected that the relationship between GDP and import to be positive
CAPITAL	POSITIVE (+)	It is expected that the relationship between capital and GDP to be positive
LABOUR	POSITIVE (+)	It is expected that the relationship between GDP and labour to be positive
EXCHANGE RATE	POSITIVE (+)	It is expected that the relationship between exchange rate and GDP to be positive

### DATA ANALYSIS: PRESENTATION AND INTERPRETATION

#### Empirical Test

#### Unit Root Test

The Augmented Dickey Fuller (ADF) and Phillip Perron (PP) test are employed to find the presence or non-presence of unit root in each of the time series analysis. The results of both the ADF and PP test are presented in Table(s) 2 and 3.

**Table 2**  
**Unit Root Test in Level**

VARIABLES	ADF			PP		
	1%	5%	10%	1%	5%	10%
RGDP	-2.049462 (-3.615588)	-2.049462 (-2.941145)	-2.049462 (-2.609066)	-1.954203 (-3.6067)	-1.954203 (-2.9378)	-1.954203 (-2.6069)
CAP	-3.178762 (-3.615588)	-3.178762 (-2.941145)	-3.178762 (-2.609066)	-2.905651 (-3.6067)	-2.905651 (-2.9378)	-2.905651 (-2.6069)
EXPO	-0.228499 (-3.621023)	-0.228499 (-2.943427)	-0.228499 (-2.6080)	-4.050405 (-3.6067)	-4.050405 (-2.9378)	-4.050405 (-2.6069)
EXR	0.405953 (-3.621023)	0.405953 (-2.943427)	0.405953 (-2.6080)	0.568490 (-3.6067)	0.568490 (-2.9378)	0.568490 (-2.6069)
IMP	2.593907 (-3.621023)	2.593907 (-2.943427)	2.593907 (-2.6080)	-2.486930 (-3.6067)	-2.486930 (-2.9378)	-2.486930 (-2.6069)
LBR	1.351854 (-3.621023)	1.351854 (-2.943427)	1.351854 (-2.6080)	0.023013 (-3.6067)	0.023013 (-2.9378)	0.023013 (-2.6069)

Source: authors computation using E-views 4.1

Note: figures in parenthesis indicate the critical values (Mackinnon critical values for the rejection of hypothesis of a unit root) which are t statistics for ADF and the PP, while figures without the parenthesis are the observed values.

The test for unit roots is confirmed by comparison of the observed values with the critical values for both the ADF and PP test statistics at 1%, 5%, and 10% levels of significance. The decision rule for confirming the presence of stationarity is to reject the null hypothesis if the calculated values of the test statistics were greater than the critical values of the test statistics (in absolute values) or also if the probability value of the calculated test statistics is less than the tabulated probability values of either 0.05% and likewise, the decision rule for confirming the presence of non-stationarity is to accept the null hypothesis if the calculated value of the test statistics is lower than the

critical value of the test statistics (absolute values) or if the calculated probability value is greater than 0.05%. Results calculated in table one reveals that the real gross domestic product, export, exchange rate, import and labour are not stationary except for capital (gross capital formation) which is stationary. That is, capital is integrated of the order zero i.e  $I(0)$ . The evidence of the presence of non-stationarity in real gross domestic product, export, exchange rate, import and labour variables provides the basis to accept the null hypothesis and therefore sufficient reason for the various variables to be differenced once (first difference) for both the ADF and PP test as presented in Table 3 below.

**Table 3**  
**Unit Root Test at First Difference**

VARIABLES	ADF			PP		
	1%	5%	10%	1%	5%	10%
RGDP	-4.419095 (-3.621023)	-4.419095 (-2.943427)	4.410995 (-2.610263)	-6.221786 (-3.615588)	-6.221786 (-2.941145)	-6.221786 (-2.609066)
CAP	-4.968617 (-3.621023)	-4.968617 (-2.943427)	-4.968617 (-2.610263)	-6.189566 (-3.615588)	-6.221786 (-2.941145)	-6.221786 (-2.609066)
EXPO	-5.783969 (-3.621023)	5.783969 (-2.943427)	5.783969 (-2.610263)	-17.42436 (-3.615588)	-17.42436 (-2.941145)	-17.42436 (-2.609066)
EXR	-3.605305 (-3.621023)	-3.605305 (-2.943427)	-3.605305 (-2.610263)	-5.272222 (-3.615588)	-5.272222 (-2.941145)	-5.272222 (-2.609066)
IMP	-4.327131 (-3.621023)	4.327131 (-2.943427)	4.327131 (-2.610263)	-5.546483 (-3.615588)	-5.546483 (-2.941145)	-5.546483 (-2.609066)
LBR	-4.128436 (-3.621023)	-4.128436 (2.943427)	-4.128436 (-2.610263)	-6.001214 (-3.615588)	-6.001214 (-2.941145)	-6.001214 (-2.609066)

Source: authors computation using E-views 4.1

Note: figures in parenthesis indicate the critical values (Mackinnon critical values for the rejection of hypothesis of a unit root) which are t statistics for ADF and the PP, while figures without the parenthesis are the observed values.

Table 4 reveals that real gross domestic product, capital, export, exchange rate, import, labour are all stationary at first difference for both the ADF and PP test statistics in other words they are integrated of the order one i.e  $I(1)$ . Thus given the conditions stated above, the

null hypothesis of non-stationarity is rejected and the alternative hypothesis is accepted which implies and confirms the presence of stationarity on all variables concerned integrated of order one, i.e  $I(1)$ .

**Table 4**  
**Summary of Integration on Variables in Annual Time Series Data**

Variab	Order of integration	
Real gross domestic product	I(1)	Sationary
Export	I(1)	Sationary
Exchange rate	I(1)	Sationary
Gross capital formation	I(0)	Sationary
Import	I(1)	Sationary
Labour	I(1)	Sationary

Source: authors compilation using E-views 4.1

### COINTEGRATION TEST RESULTS

We proceed into our co-integration test to determine if there is a long-run relationship that exist between the variables. The Auto Regressive Distributed Lag (ARDL) bound testing technique co-integration method is adopted to investigate the existence of co-integration relationship

among variables. The ARDL is preferred based on its suitability for small samples and also its applicability based on the fractionally integrated variables as confirmed by the unit root test results. The results obtained from the ARDL co-integration test carried out is presented in Table 5 below.

**Table 5**  
**Auto Regressive Distributive Lag Bound Testing for Confirming the Presence of Cointegration Among Variables**

Dependent variable	Aic lags	F-Statistic calculated	Probability	Outcome
F <sub>rgdp</sub> (rgdp expo exr cap imp lbr)	1	45.56369	0.000000	Cointegration
F <sub>expo</sub> (expo rgdp exr cap imp lbr)	1	53.01017	0.000000	Cointegration
F <sub>exr</sub> (exr rgdp expo cap imp lbr)	1	1.716178	0.125252	No cointegration
F <sub>cap</sub> (cap rgdp expo exr imp lbr)	1	4.146382	0.001392	Cointegration
F <sub>imp</sub> (imp rgdp expo exr cap lbr)	1	226.3893	0.000000	Cointegration
F <sub>lbr</sub> (lbr rgdp expo exr cap imp)	1	36.041444	0.000000	Cointegration

Source: authors computation using E-views 4.1

Results as shown in Table 5 indicates that the Alkalike information criterion (AIC) lags which is derived by selecting the minimum value of the AIC after estimating at different lag periods. It was found out that Lag 1 had the minimum value of AIC after comparison with the values from Lags 2 and 3 respectively. The F-statistics shows the results for each calculated variable when considered as a dependent variable in the ARDL-OLS regression. The calculated F-statistics is compared with critical values for the bound test using the Pesaran *et al.* (2001). Thus the null hypothesis of no co-integration is rejected if the F-statistics is higher than the upper bound critical values at the significant level chosen, and the null hypothesis of no co-integration is accepted if the F-statistics is lower than

the lower bound critical value. Based on the statement above a 5% level of significance is adopted for the critical values for the bound testing technique and therefore we empirically deduced that the null hypothesis of no co-integration is rejected for the variables real gross domestic product, export, capital (gross capital formation), import, labour implying that there is a long-run co-integration among the variables when normalized for Nigeria; while the null hypothesis of no co-integration is accepted for the exchange rate variable, implying that there is no long-run co-integration between the exchange rate and other variables in their normalized form for Nigeria. Once long-run co-integration has been established, it is necessary to estimate the long-run coefficients depicted below.

**Table 6**  
**Long-Run Coefficient of the Autoregressive Distributive Lag**

Regressors	Coefficients	Standard error	T-statistics	P-value
C	-1680000	3160000	-0.531193	0.5990
Expo(-1)	13749.98	6329.209	2.172465	0.0373**
Exr(-1)	890000	2530000	3.522404	0.0013**
Imp(-1)	-109039.2	25828.16	-4.221718	0.0002**
Lbr(-1)	8283.174	2422.088	3.419848	0.0017**
Cap(-1)	0.792452	0.170366	4.651469	0.0001**

\*\* denote that the values are statistically significant at 0.005%

The coefficients of the co-integration test revealed the elasticity of the various variables. It shows the long run

relationship i.e., the impact of the independent variable on the dependent variable in the long run.

**Table 7**  
**Error Correction Model**

	Coefficients	Standard error	T-statistics	P-value
C	103000	456000	0.226630	0.8222
$\Delta$ expo(-1)	13269.38	4204.094	3-156300	0.0036**
$\Delta$ cap(-1)	1208569	0.139374	8.671436	0.0000**
$\Delta$ exr(-1)	7.76000	380000	2.518363	0.0194**
$\Delta$ lbr(-1)	764.7310	3248.497	0.235411	0.8155
$\Delta$ imp(-1)	-68258.89	2171.48	-3.239397	0.0029**
E $\delta$ m(-1)	0.065747	0.232658	0.282590	0.7794
R <sup>2</sup>	0.792142			
Durbin-watson	2.139568			

Source: author's computation

\*\* denotes that the values are statistically significant at 0.05%

The Table 7 above represents the error correction model (ECM) results, the ECM is used to correct for disequilibrium i.e. it is used to reconcile the short run behaviour of an economic variable with its long run behaviour.

The greater the coefficient of the ECM, the quicker the speed of adjustment of the model from the short runs to the long run. In the result above the ECM coefficient is 0.065747 and statistically insignificant at this point. Thus about 6% of the discrepancy between the long run and short term is corrected within a year revealing that there is a slow speed of adjustment between the

dependent variable and the independent variables from the short run to the long run. The coefficients of multiple determination stood at 0.792142 (79%) which means that the explanatory variables export, import, capital, exchange rate, and labour accounted for 79% of the total change in the dependent variable (RGDP) which describes a good fit. The test for autocorrelation was performed by making use of the durbin watson statistics which was found to be 2.13, a value within the normal region which falls within the determined region (1.5 < d < 4) and connotes that there is a negative first order serial autocorrelation among the explanatory variables.

**CAUSALITY TEST RESULT**

**Table 8**  
**Result of Causality Test**

S/No	Null hypothesis	Obsevatons	F-statistics	Probability
1	CAP does not Granger Cause RGDP RGDP does not Granger Cause CAP	39	14.5904 0.50060	0.00051 0.48379
2	EXPO does not Granger Cause RGDP RGDP does not Granger Cause EXPO	39	4.92607 0.87044	0.03284 0.35705
3	EXR does not Granger Cause RGDP RGDP does not Granger Cause EXR	39	0.56764 0.00349	0.45610 0.95319
4	IMP does not Granger Cause RGDP RGDP does not Granger Cause IMP	39	4.02754 10.5991	0.05232 0.00247
5	LBR does not Granger Cause RGDP RGDP does not Granger Cause LBR	39	1.84382 8.12429	0.18295 0.00718
6	EXPO does not Granger Cause CAP CAP does not Granger Cause EXPO	39	1.68043 6.34309	0.20312 0.01637
7	EXR does not Granger Cause CAP CAP does not Granger Cause EXR	39	0.24419 0.30818	0.62420 0.58223
8	IMP does not Granger Cause CAP CAP does not Granger Cause IMP	39	0.97330 2.46774	0.33044 0.12495
9	LBR does not Granger Cause CAP CAP does not Granger Cause LBR	39	0.83220 2.17725	0.36771 0.14876
10	EXR does not Granger Cause EXPO EXPO does not Granger Cause EXR	39	46.5591 0.93719	5.6E-08 0.33946
11	IMP does not Granger Cause EXPO EXPO does not Granger Cause IMP	39	14.5564 1.99270	0.00051 0.16664
12	LBR does not Granger Cause EXPO EXPO does not Granger Cause LBR	39	2.25050 12.7750	0.14229 0.00102
13	IMP does not Granger Cause EXR EXR does not Granger Cause IMP	39	1.51483 16.5913	0.22638 0.00024

To be continued

Continued

S/No	Null hypothesis	Obsevatons	F-statistics	Probability
14	LBR does not Granger Cause EXR	39	0.51997	0.47551
	EXR does not Granger Cause LBR		4.83754	0.03435
15	LBR does not Granger Cause IMP	39	5.62927	0.02313
	IMP does not Granger Cause LBR		16.6370	0.00024

Source: author's compilation

Table 8 above shows the result of the granger causality test performed at null hypothesis. The pair wise granger causality was carried out and a 0.05% statistical level of significance is considered, therefore we reject the null hypothesis if our probability value is less than 0.05 and accept the null hypothesis if it is greater than 0.05. Consequently, the result revealed that we reject the null hypothesis that capital does not granger cause economic growth (RGDP) and accept the alternative hypothesis that capital granger causes economic growth. Likewise we reject the null hypothesis that export does not granger cause economic growth and accept the alternative hypothesis that exports granger causes economic growth. The null hypothesis is accepted when we consider the causality between exchange rate and economic growth above. However, the null hypothesis is rejected for imports and economic growth and the results reveal a bidirectional relationship between both variables. Thus, we accept the alternative hypothesis. Row 5 reveals that the null hypothesis is accepted because labour does not granger cause economic growth but the alternative hypothesis is accepted that economic growth granger causes labour. Row 6 the null hypothesis is accepted that export does not granger cause capital but the alternative hypothesis is accepted that capital granger cause export. Row 7 both null hypothesis is accepted that exchange rate does not granger cause capital and capital does not granger cause exchange rate. Row 8, we accept the null hypothesis that import does not granger cause capital and capital does not granger cause import. Row 9, we accept the null hypothesis that labour does not granger cause capital and capital does not granger cause labour. Row 10, we accept the null hypothesis also that exchange rate does not granger cause export and export does nor granger cause exchange rate. Row 11, we reject the null hypothesis that import does not granger cause export and accept the null hypothesis that export does not granger cause import. Row 12, we accept the null hypothesis that labour does not granger cause export and reject the null hypothesis that export does not granger cause labour. Row 13, we accept the null hypothesis that import does not granger cause exchange rate and reject the null hypothesis that exchange rate does not granger cause import. Row 14, we accept the null hypothesis that labour does not granger cause exchange rate and reject the null hypothesis that exchange rate does not granger cause labour. Row 15, we reject the null hypothesis for both situations that

labour does not granger cause import and also reject the null hypothesis that import does not granger cause labour.

## SUMMARY AND CONCLUSION

The major underpinning of this research is to investigate the export and economic growth nexus in Nigeria from 1970-2010, based on the important role export plays in the economic growth of countries and evidence gathered from existing literature for other countries in Africa and around the globe which suggests that economic growth can be achieved by engaging more in export. Therefore, this study employed empirical evidence based on data sourced from the World development Index, National Bureau of statistics, and the Central Bank of Nigeria for a 41 years data point in order to determine and confirm if there is a causal relationship between export and economic growth in Nigeria. A host of economic tools were engaged to achieve this aim and in the process other variables were identified and included to arrive at a reliable and relevant result. In this context, this study employed the use of ADF and PP unit root test to test for stationarity in order to avoid generating spurious data and results showed that all variables except capital (gross capital formation) were found to be non-stationary and therefore prompting a first difference stationary test to be conducted, which was proved to be true. Also a test for co-integration using the auto regressive distributive lag (ARDL) was conducted and results revealed that there is a long run relationship between all the variables except exchange rate. The presence of co-integration implied that there exist a causal relationship between export and economic growth. However, the co-integration failed to give a clear cut direction as to this causality. The ECM was performed to see how the short run and long run disequilibrium are adjusted for and at what speed it will take for equilibrium to be maintained.

In order to ascertain the direction of causality, between export and economic growth a granger causality test was carried out and result revealed that there is a unidirectional relationship between export and economic growth in Nigeria. The policy implication as evidenced from the results of the study is that the government should endeavour to invest more into the export sector, promote diversification of the economy from its over dependence on crude oil, facilitate proper machineries and provide infrastructures to support and motivate export activities,

which by multiplier effect, lead to economic growth. Export policies should be directed to the sector in which the impact of an increase in economic growth will be both desirable and large.

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