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A Test of the Validity of Export-Led Growth Hypothesis in Nigeria: A Further Evidence

*Olayinka Idowu Kareem**

This study tests the validity of the hypothesis of export – led growth in Nigeria. Several arguments have been adduced with respect to this hypothesis in the literature, while empirical studies for Nigeria had put forward different results based on the period of coverage and the methodology. Given that economic models perform better with large time series, this study has used the period from 1960 – 2005 with adoption of a neo – classical Cobb – Douglas production model that was estimated through both linear and log – linear least squares technique. The effects of shocks to the explanatory variables on economic growth were captured by the impulse response model, while the granger causality test shows the direction of causality in the model. The study found that both oil and non – oil exports contributed to the enhanced economic growth that the country witnessed, however, the oil export is more significant to economic growth in Nigeria. Thus, feedback causality exists between oil export and growth, while there is unidirectional causality that runs from economic growth to non – oil export. Furthermore, shocks to oil exports will significantly affect Nigeria’s economic growth. Therefore, this suggest that an outward – oriented industrialization strategy through export promotion policies, should be embark upon by the government, especially those that will stimulate non – oil exports so as to averse the risk of negative oil export shock that would drop the level of economic growth.

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I. Introduction

There has been a renewed interest in the study of export-led-growth hypothesis in the literature. The nature of the relationship that exists between exports and growth of national output has been debated in most of the recent development literatures, but little or no consensus is reached. The core of this argument is the question of whether economic growth as witnessed by some countries is usually driven by exports or that it is economic growth that leads to export performance.

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This question is pertinent in the sense that, establishing the causality between export and growth has a great implication for policy-makers' decision about the appropriate and relevant strategies and policies to adopt for economic growth and development. Although, the literature does not dispute that there is a strong correlation between exports and growth (see Medina-Smith, 2001), empirical evidences such as Kareem, (2005); Awokuse, 2003; Amavilah, (2002); Wadud (2000); etc have produced different results on the nature and direction of the causality between export and output growth. However, most of these studies focus on the causality between exports and output growth in the developing countries (Michaely, 1977; Balassa 1978; Chow 1987). Following the experience of the newly industrialized Asian countries, especially the Asian Tigers, e.g. Singapore, Taiwan, South Korea and Hong Kong whose rapid growth is usually attributed to their export expansion and promotion, most developing countries adopted the export promotion strategy (so as to experience similar level of economic growth). But, evidences have shown that while some had the expected growth others do not (Lee and Huang, 2002).

Nigeria, a developing country, had initially adopted an inward-looking development strategy called Import Substitution Industrialization Strategy (ISI), a strategy that aimed at replacing imported items with the locally produced ones, especially in terms of the use of local raw materials. After several years of experimentation, without the expected results, as importation especially that of capital inputs kept on increasing, the foreign exchange reserves was depleting. This led to a change of policy from an inward-looking strategy to the outward strategy called Export Promotion Industrialization (EPI) Strategy. This strategy is now pursued with the aim that it will translate into economic growth.

Furthermore, concerted efforts have been made and are still being made to encourage domestic production for exports. The Nigerian government has been making efforts to stimulate output in other sectors of the economy apart from oil sector so as to increase the number of products in the country export structure. Thus, the main objective of this study is to determine whether the exports-led growth hypothesis applies to Nigeria or not.

II. Justification of the Study

The notion that exports activity leads to economic growth has been subjected to a lot of arguments in economic development and policy circle for many decades (see Keesing, 1967; Krueger, 1985). The reason for these arguments was due to the unprecedented economic growth that the newly industrialized countries in Asia witnessed in the last two decades, which has propelled many developing countries to shift from inward-oriented economies to outward-oriented economies that allows for liberalization and opening of the economy. This is in line with the fundamental assertions of the theory of Comparative advantage, which allows for export-led-growth. However, as is traditional in economics science, a contradictory opinion that economic growth leads to the growth of exports (GLE) is also expressed, particularly for countries that are at their early stages of economic development.

Further, the export-led-growth hypothesis which is based on the assumption of unidirectional causality from exports to growth has been tested empirically by many development and international trade authors, including studies by Mrdalo (2004), Herzer, et al. (2004), Abu-Quarn and Abu Bader (2004), Abual-foul (2004), Awokuse (2003), Lee and Huang (2002), Medina-Smith (2001), Giles and Williams (2000) e.t.c. In Africa, similar studies include Kareem (2005), Okoh (2004), Lawanson et al (2004), Amavilah (2002), Olomola (1998), Oladipo (1998), Ekpo and Egwaikhide (1994), Egwaikhide (1989, 1992), Fosu (1990) Fajana (1979), Oyejide (1975), Hensley (1971). These studies were carried out to ascertain the applicability of the hypothesis to their various countries or regions.

However, while some of these studies supported export-led-growth hypothesis, i.e. Lawanson et al (2004), Awokuse (2003), Wadud (2000), Olomola (1998), Park and Prime (1997), Al-Yousif (1997), Ekpo and Egwaikhide (1994), Egwaikhide (1992), Sheehey (1992), Fosu (1990), Fajana (1979). Another empirical results show that the direction of causality is from growth to export growth therefore confirming the growth led export hypothesis (GLE); e.g. Abu-Quarn and Abu-Bader (2004), Herzer, et al (2004), Bhasin (1999), Ahmed and Kwan (1991), Jung and Marshall (1985) among others. While,

Kareem (2006), Ahmed and Harnhirun (1995), Kwan and Cotsomotis (1991), Chow (1987), etc. found a feedback relationship. These show that there has not been consensus as to the direction of causality in the export-led growth hypothesis.

Various methods had been used to carry out these aforementioned empirical studies, while some used OLS, Stationarity and cointegration tests; others test this hypothesis with 2SLS, 3SLS and Granger Causality. Further, while most of the studies used bi-variate analysis, recent studies made use of multivariate analysis that include the use of other trade variables to joint export and output (GDP). Some studies even study the causality between fiscal policy and growth, global integration and growth as well as globalization and growth.

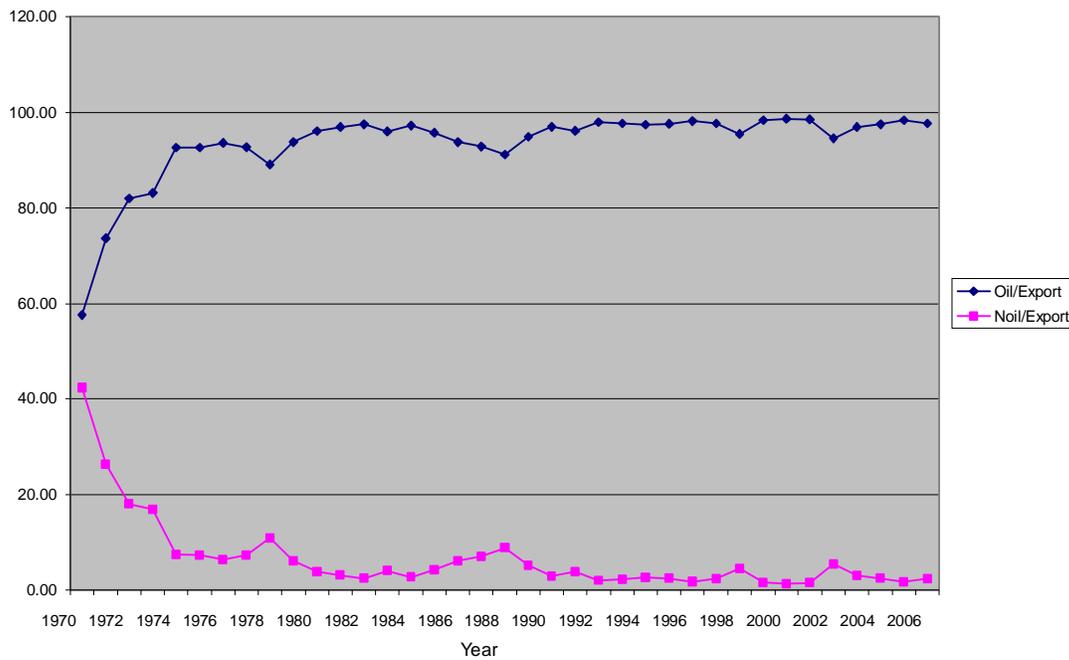
However, from the aforementioned studies we discovered that none of the studies as taken into consideration the effects of any shock to foreign exchange earnings from export as a result of shock in the international price/demand of the export, it is against this backdrop it becomes necessary to know what would happen to Nigeria's economic growth if there is shock to her exports earnings in international market. This gap we intend to fill in this study by introducing the methods of impulse response as well as the variance decomposition, in order to know the periodic effect of this shock on the economy. Granger Causality test will also be used in this study. These estimation techniques have not been combine in any known study in this area in the literature. Thus, the combinations of these analytical techniques serve as a more pragmatic way of testing export-led-growth hypothesis so as to eliminate any biasness and other estimation hindrances that might distort our findings.

III. Nigeria's Exports Performance

Before the oil boom of the 1970s, Nigeria's economy was mainly an agrarian economy; with the bulk of its foreign exchange coming from the sales of cash crops such as cocoa, groundnut, coffee, cotton and palm produce. However, following the discovery of oil and with the oil boom of the 1970s, crude oil then took over from agriculture as the major foreign

exchange earner for the country, constituting about 93 percent of the total exports between 1970 – 1985, rising to 96.8 percent by 1985 – 1996 and 99 percent by 2000 (Kareem, 2004). The share of oil export in total exports dropped to about 94.6% in 2002 due to a cut in the Organisation of Petroleum Exporting Countries (OPEC) supply quotas of which Nigeria was affected. However, the country’s oil export share rose to about 95% in 2003 and by 2006, it has gotten to over 97%.

Figure 1: Share of Oil and Non-Oil Exports in Total Exports (%)



On the other hand, the share of non-oil exports in total exports declined from 7.0 percent in the period 1970-1985 to about 4 percent between 1986 and 1988. In 1990, the share of non-oil exports in total exports declined to about 3% and by 2000, it dropped to 1.3%. Though, it picked up to over 5% in 2002, but later fell to 2% in 2006. The decline recorded in the non- oil exports was due to the problems being encountered by the agricultural sector (e.g. inadequate government support, inadequate credit facility, e.t.c.), which was worsened by inappropriate pricing policies, a dearth of farm labor, caused by rural-urban migration, and infrastructural inadequacy in

the rural areas. The government made appreciable efforts to resuscitate the non-oil sector of the economy during the SAP era. Despite all the measures that were put in place, the performance of the non-oil export sector has remained dismal, as crude oil still remains Nigeria's major export.

Regarding the trend in the Nigeria's exports, table 1 shows that in the period 1970-1974, the country's average exports was $\times 2.337$ billion, this rose to $\times 7.241$ billion in 1975-1979 period. Nigeria's exports continue to increase in the period 1980-1984 with an average export of $\times 10$ billion, which later increased to $\times 28.033$ billion in the period 1985-1989 and got to $\times 172.372$ billion in 1990-1994. The export promotion strategy that was adopted during these period further yielded favourable result as the country witnessed increase in average exports between the period 1995-1999 to $\times 1.088$ trillion and in the period 2000-2004 it risen to $\times 2.650$ trillion. The enabling export policies of the government propel the country's export to $\times 5.753$ trillion in 2006. This trend shows that in absolute term, the value of Nigeria's total exports has been increasing overtime.

Table 1: The Average Nigeria's Exports from 1970-2006 (\times ' Million)

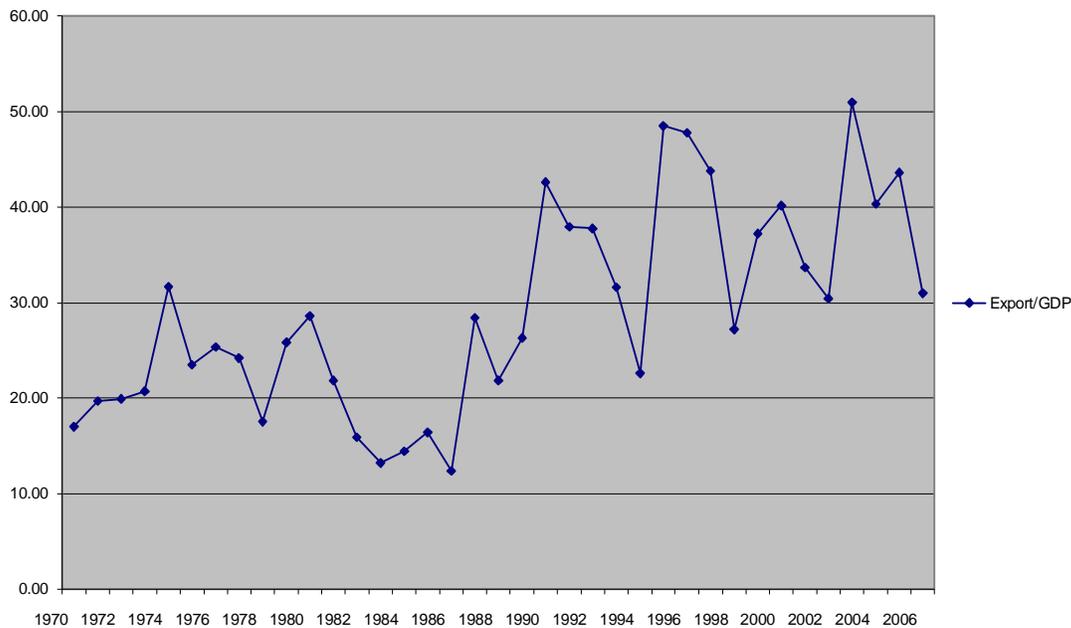
Year	Export	Oil	Non-Oil	GDP
1970-74	2337.24	1979.68	357.56	9654.62
1975-79	7241.7	6705.18	536.52	31124.28
1980-84	10001.38	9671.56	329.82	54274.86
1985-89	28033.2	26250.6	1782.6	122651.6
1990-94	172372.46	167871.5	4500.96	545029.82
1995-99	1088538.8	1062708.8	25830	2699095.38
2000-04	2649704.6	2578574.74	71129.82	6717311.38
2005	6372052.4	6266096.6	105955.8	14610881.5
2006	5752747.7	5619152.9	133594.8	18564594.73

Source: CBN Statistical Bulletin (Several Issues)

However, in terms of total exports share in the gross domestic products (GDP), as could be seen in figure 2, this share has been oscillating all through the selected years in this study. This means that Nigeria's export

contribution in the GDP has not been stable overtime, which might be due to changes in government export policies. For instance, in 1975 it share was about 24%, but by 1985, it has dropped to 16%, which later rose to 48% in 1995. Furthermore, in 2005, the share of total exports in the GDP has declined to about 44%, with a further drop in 2006 to about 31%. This trend shows that Nigeria's has to re-strategize and put in place appropriate export policies that would enhance and accelerate the export promotion drive, which has the potential of translating to sustainable economic growth and development.

Figure 2: The Share of Nigeria's Total Exports in GDP (%)



IV. Theoretical Issues

Export-led-growth hypothesis (ELGH) states that the expansion and promotion of exports is an important factor in promoting long-run economic growth. This hypothesis has been put forward as the rationale and efficient alternative to the import substitution strategy, that is, an inward-orientation strategy of development. The ELGH which is an outward-orientation development strategy is said to accelerate the level of total-factor

productivity growth (Ram, 1987, Kavoussi, 1984; Bhagwati, 1978; Krueger, 1978); encourages foreign direct investment (Balasubramanyam, et al., 1996).

The competition pressure in the global market may lead to improved product quality and force domestic producers to reduce inefficiencies. According to Bhagwati (1978) and Krueger (1978), the allocative inefficiencies of exchange control are likely to be reduced through foreign exchange liberalization, which is an important component of the export led growth strategy. The outward-oriented development strategy as a catalyst of growth has drawn a vast body of empirical research in the past three decades (Heller and Parter, 1978; Feder 1983; kavoussi, 1984; Jung and Marshall 1985; Chow 1987; Ram, 1987; Dollar, 1990; Fosu, 1990; Salvatore and Hatchar, 1991; Ekpo and Egwaikhede, 1994; Olomola, 1998; Bhasin, 1999; Wadud, 2000; Awokuse, 2003; Abu-Quarn and Abu-Bader, 2004; Mrdalo, 2004; Herzer, et al, 2004; Okoh, 2004; Lawanson et al, 2004; Kareem, 2005).

Therefore, the choice between inward and outward oriented development strategies for enhancing industrial development that would translate into growth and development is long standing. The former can be couched in terms of the infant industry argument, while the latter entails a neutral strategy with no bias against exports. There are very few exceptions in previous studies of export-led-growth that have not talked about the importance and role of other macroeconomic variables, such as investments, imports, exchange rate, energy etc.

There are several arguments that are put forward to justify the export-led-growth hypothesis in the literature. First, export growth indicates a rise in the demand for a country's output and, thus, serves to accelerate real output. Second, specialization in production of export products may be encouraged through export expansion and this might enhance the level of productivity and that of skill acquisition in the export sector. Verdoorn (1949) postulates that changes in productivity may lead to growth in the level of output. Further, according to Hart (1983), Ben-David and Loewy (1998), the outward oriented strategy might give access to advanced technologies, better management practices and learning by doing gains,

which might lead to additional efficiency gain. Third, based on the study of Chenery and Strout (1966), an increase in exports may reduce the constraints to foreign exchange that would make it easier to import inputs to meet domestic demand, and so enhance output expansion. Thus, export promotion would erase the controls that arise from overvaluation of domestic currency.

The development of some goods for exports based on a country's comparative advantages may propel the exploitation of economies of scale that domestic markets are too small for optimal scale to be achieved while increasing returns may occur with access to foreign markets. The ELG may also be examined under product and industry life-cycle hypothesis. Economic growth is described under this hypothesis as a cycle that begins with exports of primary goods. Giles and Williams (2000) posit that economic growth and knowledge change the structure of the domestic economy, including consumer demand that propels the more technology intensive domestic industry to start exporting. As the domestic demand ebbs, there is increase in economic growth from the now technologically advanced exports. Lal and Rajapatirana (1987) opined that an outward-oriented strategy of development may provide improved opportunities and rewards for entrepreneurial activity that is assumed to be the key to extended growth.

However, the main focus of export-led growth hypothesis debate is to establish whether outward oriented trade strategy or inward strategy really serves a country better. But, based on the neoclassical view, growth can be achieved through export promotion. And the case of the newly industrializing countries (NICs) can be easily given as an example. These NICs have doubled their standard of living every decade in the last three decades. China is another country who has joined the league of NICs. As Findlay and Watson (1996) rightly put the Chinese experience during 1980s tends to support the argument that openness due to trade is an important avenue through which countries can achieve rapid and efficient growth and better distribution of domestic resources. This assertion of trade aiding growth can also be said for other countries based on several studies that have been carried out including Krueger (1995) which identifies trade

policy as an important and crucial element of economic policy. Given this, the World Bank (1993) takes the experiences of these countries as a 'model' for development.

Though, there has been a lot of enthusiasm and support for export led growth hypothesis and that of trade-growth nexus, this support cannot be said to be universal as there are some critics of this hypothesis that have been antagonizing the features of export-led-growth hypothesis. Buffie (1992) believes that the experiences in the South east and East Asian countries are unique in several ways and not necessarily that these experiences could be repeated in other countries. Other researchers like Jaffee (1985) argue that the reliance on exports to lead the economy to sustainable long-term economic growth, especially in developing countries could not necessarily be the case due to volatility and unpredictability in the world market. Adelman (1984) questions whether trade barriers will hinder the route of development or if the market in advanced countries are enough for much exports from the developing world. Thus, there are scholars that agreed with the counter development strategy of import substitution or protectionism (e.g. Prebisch, 1950; Singer, 1950). This strategy includes the use of different policy instrument, such as quotas, subsidies and tariffs, to replace the domestic output for imports; the implementation of inward-oriented strategy occurs without effects from other economies and it could be used to raise output and employment immediately. This kind of policy of the government can be used to facilitate domestic firms instead of foreign ones. Hamilton and Thompson (1994) opine that the experience of Latin American countries have shown that trade between the North and South has been yielding negative impact on some Latin American countries, which then translates to high expenditure for the government on incentive schemes, domestic industry setbacks, agriculture, trade imbalance as well as ecological damage. Eswaran and Kotwal (1993) further argue that part of these effects may be due to the nature and kind of good that is being traded.

The promotion of import substitution development strategies could help in the development of a variety of industries that would promote rapid industrial development, while export promotion might just result in the

selection of a number of industries. This may lead to a situation where the country is held back producing goods from which the economic benefits have been exhausted. Some scholars, especially Corden (1987), argue that there might be a rise in taxes in a hidden fashion, if government uses tariffs, quotas, etc in financing the level of development. Grossman and Helpman (1991) argue that the explicit use of tariffs may benefit countries with a comparative disadvantage in the key sectors e.g. Research and Development, which might lead to growth. Based on empirical findings, it is shown that many countries promote exports in one or more sectors, while protecting others. Thus, the combination of export promotion and import substitution strategies may well be complementary, while the latter may be a necessary step for export-led growth (e.g., Hamilton and Thompson, 1944; Ogunkola, 2005).

Another direction to this argument in the literature is the potential of growth-led export (GLE). Growth-led export is likely unless antitrade bias results from the growth-induced supply and demand (Bhagwati, 1988). The Neoclassical trade theory supports this notion, as it posits that there are other factors apart from exports that are responsible for output growth; for example, factor productivity growth. Lancaster (1980); Krugman (1984); Jung and Marshall (1985); Ahmed and Kwan (1991); Bhasin (1999); Herzer, et al (2004), etc., justify the GLE and argue that economic growth leads to improvement in skills acquisition and technology, which translate to a rise in the level of efficiency that would facilitate a comparative advantage for the country that facilitates exports. Moreover, government intervention in the economy due to market failure might lead to GLE.

Feedback causality also exists between export and income growth. Helpman and Krugman (1985) assert that exports may be due to the realization of economies of scale as a result of productivity gains; which might enable reduction in cost that will ultimately translates into further output gains. An increased trade produces more income that also leads to more trade, and so on (Bhagwati, 1988).

However, irrespective of the aforementioned arguments, Pact (1988) argue that there are still possibilities for absence of causality between exports

and economic growth when the growth paths of the two time series are determined by other, unrelated variables in the economic system.

V. Theoretical Framework

The export-led growth hypothesis postulates that exports are essential ingredient for the enhancement and acceleration of long run economic growth. Theoretically, a lot of argument had been put forward to justify the export-led growth hypothesis. There are two perspectives to this hypothesis: the demand and supply side. The demand-side perspective argued that demand growth sustainability cannot be maintained in a domestic market that is small, given the fact that economic impulse based on the expansion of domestic demand is bound to be exhausted quickly. In contrast, export market can not be exhausted and do not involve growth restriction on the demand side. Agosin (1999) opined that as a component of growth, exports could be a catalyst of output growth.

Further, from the supply-side of export-led growth hypothesis, the expansion of exports could promote and enhance economic growth through a rise in the total factor productivity (TFP). This begins with the fact that an expansion in exports might enhance and encourage specialization in sectors that have comparative advantage in the country and it will lead to reallocation of resources from a relatively inefficient non-trade sector to the more productive export sector (Silvestors and Herzer, 2005). Also, Helpman and Krugman (1985) opined that the growth of exports can increase productivity by offering larger economies of scale. In addition, export growth might affect total factor productivity through dynamic spillover effects on the rest of the economy (Feder, 1983). The sources of these knowledge externalities include productivity growth through increased competitiveness, more efficient management styles, better forms of organization, labour training, and knowledge about technology and international markets (Chuang, 1998). This knowledge is acquired through a systematic learning mechanism initiated by exports and spilling over to the domestic economy. Lastly, Riezman, et al. (1996) believed that export expansion might indirectly affect growth by providing the foreign exchange that allows for increasing levels of capital goods imports. Then, by increasing

the importation of capital goods would stimulate output growth by raising the level of capital formation. Thus, the importation of capital goods from technologically advanced countries might lead to a rise in the productivity, which could translate to economic growth, given the fact that knowledge and technology are embodied in equipment and machinery that are transferred through international trade (Chuang, 1998).

Further, base on this ELGH efforts have been made in the literature to disaggregate the exports so as to show the impact of these categories of exports on economic growth. Lucas (1993) opined that the dynamic effects of spillover of the technology are associated with manufacturing exports rather than primary exports. However, many scholars (e.g. Dawe, 1996) have hypothesize that both primary and mining exports could serve as hindrances to greater productivity growth. They based their argument on the fact that (i) primary goods give no sustainable potential for the spillover of knowledge, and thus a rise in export of primary goods could move resources from the externality generating manufacturing sector (Sachs and Warner, 1995). (ii) Also, that extreme price and volume fluctuations affect primary exports. Thus, there might be a rise in GDP volatility and uncertain in the macro economy due to a rise in the primary exports. According to Dawe (1996) this volatility and certainty might also hinder efforts at planning the economy and bring down the efficient and that of quantity of investment.

Another theoretical basis for the study is that of Heckscher-Ohlin (1933) theory, which was developed by Heckscher-Ohlin (1933). This theory tends to relax and modify some of the assumption of the classical theory in order to provide a realistic and better reason for the existence of differences in the comparative costs between countries. This theory was built around two basic features of countries and goods. That countries differ from each other based on the factors of production they possess, and also that goods differ from each other based on the factors that are required in their production. Given this as it may, they posited that a country would be able to produce at a lower cost (and this posses comparative advantage in) those goods whose production requires relatively large amounts of the factors of production (this is also known as factor endowment, e.g., labour, land, capital, natural resources) with which the country is relatively

endowed. This theory of trade is also known as modern theory of external trade or better still neoclassical theory of external trade. This theory differs from that of Classical theory in the sense that it introduces capita as a second factor of production and then relaxes the assumption that each economy has a fixed input/output technology. But, assume that technology sets available to each country are identical and that tastes in the two countries are identical. Trade in this theory is as a result of the differences in comparative cost, which is due to inter-country differences in relative factor endowment (Okoh, 2004). Agiebenebo (1995) argued that this theory leads to free trade internationally and it will enable domestic economy to maximize national and global production efficiency, output, consumption and welfare. But, concluded that the policy inference of the neoclassical and that of classical theories are exactly the same.

The theory of Vent-for-surplus was developed by Adam Smith (1937) to extending domestic markets. This theory assumed positive correlation between foreign trade and economic growth. According to Irwin (1996) this theory was made known due to the success of the Asian newly industrializing countries in the 1980s and 1990s. According to this theory there are opportunities to put to adequate use formally underemployed land and labour resources to produce greater output for export to foreign market rather than reallocating fully used resources as it is in the traditional theory. Also, the idle resources would be adequately utilized with liberalization of trade and it will increase the production of primary products for exports thereby moving the domestic economy towards its production possibility frontier. Todaro (1977) and Iyoha (1995) agreed that this theory provide a better realistic analytical framework of the past trading experience of developing countries than that of classical and neoclassical theories. Thus, this theory tends to show that if a country is producing within or inside its production possibility frontier, this means that there is underutilization of resources, which will propel the country to rent or mobilize these resources for export purposes and thereby moving toward and along the production possibility frontier.

VI. The Model

On the basis of the above theoretical background, the empirical model of the study will start with a Cobb-Douglas neo-classical production function, given the fact that Krugman and Obstfeld (2000) agreed that neoclassical model is a better model to work with than the classical and specific factor models. Since it conveys a deeper understanding of how resources may drive trade patterns. Therefore, we adopt Herzer, *et al* (2004) neoclassical Cobb-Douglas production function with some modifications, in terms of inclusion of some vital variables;

$$Y_t = A_t K_t^\alpha L_t^\beta \quad (1)$$

Where Y_t denotes the aggregate output of the economy at time t , (*GDP*), and A_t , K_t , L_t are the levels of total factor productivity, the capital stock, and the stock of labour, respectively. Given the fact that we want to know if exports affect economic growth through increasing productivity, then we assume that total factor productivity (TFP) could be expressed as a function of oil and non exports, capital goods import, investment, education and energy consumption. The rationale for inclusion of these variables is to prevent spurious conclusions regarding ELG hypothesis and to endogenize growth equation. According to Shan and Sun (1998) any study that does not consider the endogenous nature of the growth process, to a large extent, are liable to simultaneity bias and would give unreliable conclusions. Therefore, TFP is expressed as:

$$\begin{aligned} A_t &= f(OX_t, NOX_t, CM_t, INV_t, EC_t) \\ &= OX_t^a NOX_t^b CM_t^c INV_t^d EC_t^f \end{aligned} \quad (2)$$

Where

- OX = Growth rate of Oil Exports
- NOX = Growth rate of non oil exports
- CM = Growth rate of Imports of Capital goods
- INV = Growth rate of Investment
- EC = Growth rate of Energy Consumption

Combining equation (1) and (2) to obtain

$$Y = K_t^\alpha L_t^\beta OX_t^a NOX_t^b CM_t^c INV_t^d EC_t^f \quad (3)$$

where: α , β , a , b , c , d , e , f , and i are the elasticities of production with respect to K_t , L_t , OX_t , NOX_t , CM_t , INV_t , ED_t , and EC_t , respectively. Thus, taking the natural logs (ln) of both sides of equation (3) gives the estimable linear production form:

$$\ln Y_t = V_o + \alpha \ln K_t + \beta \ln L_t + a \ln OX_t + b \ln NOX_t + c \ln CM_t + d \ln INV_t + e \ln EC_t + 1, \dots \dots \dots (4)$$

Where V_o is the constant and λ_t is the stochastic or disturbance terms, which stands for, among others, the influence of other exogenous variables that are not considered in the model. Thus, the estimates of a , b , c , d , and e are the coefficients and at the same time elasticities of the five selected exports variables, they also serve to measure the productivity effects of these exports on economic growth.

A-priori Expectations

Theoretically, in growth equation (4), we expect each of the explanatory variables to have a direct effect on the real GDP, that is, the coefficients $\alpha, \beta, a, b, c, d, e, > 0$.

VII. Estimation Technique

Prior to testing for the direction of causality between the time series, the first step is to check the stationarity of the variables used in the models. The purpose of this test is to establish whether the time series have a stationary trend, and, if non-stationary, to determine the order of integration. The Augmented Dickey Fuller (ADF) unit root test shall be used to test the stationarity of each of the time series that will be used in this study. After testing for the stationarity or otherwise of the time series we find that they are I(1) variables, the next step is to test whether these time series can be co-opted to give meaningful results through a cointegration test. This study shall use the Johansen cointegration test developed by Johansen (1995) rather than that of Engle-Granger (1987). The reason for this is that, Engle-Granger usually estimates the cointegration equation and tests the residuals for stationarity, which have the tendency to be biased. Apart from that it assumes one cointegrating vector in the systems

with more than two variables and lastly it assumes arbitrary normalization of the cointegrating vector. Given these shortcomings we specify the full information maximum likelihood (FIML) cointegration approach developed by Johansen (1995).

After examining the time series properties of these data, the next step is to estimate the growth equation. In this study, we shall be using the least square estimation. Granger Causality test shall be used to test for causality in the model. This study makes use of annual time series from 1960 – 2005. And they shall be sourced from Central Bank of Nigeria (CBN) publications, National Bureau of Statistics (NBOS), World Development Indicator (WDI).

VIII. Empirical Findings

We present different results in this section in order to make adequate comparison among them. The results of ordinary least square (OLS) at level and the natural logarithm, stationarity and cointegration tests, impulse response and that of granger causality test are given here.

The Regression Results

We presented two types of regression results, with and without natural logarithms.

Table 2: Regression Result

Variable	Regression with log	Without log
Constant	3.6007 (8.63)	134197.1 (1.26)
OX	0.5153 (9.08)	1.2405 (33.08)
NOX	0.1353 (1.80)	11.6173 (2.90)
CM	0.1111 (1.33)	-1.6011 (-4.43)
EC	0.0114 (0.16)	5795.134 (1.66)
INV	-0.0019 (-0.09)	-789.0929 (-3.77)
L	-1.6889 (-3.36)	-52697.67 (-1.27)
K	0.2320 (1.95)	2.5679 (19.97)
R ²	0.98	0.98
S.Error	0.0611	2289.35
F-Statistics	2078.056	5776.472
D.Watson	2.1975	2.1413

The t-values are in parentheses

Source: Author's computation

The result with logarithms shows that there is a significant positive relationship between oil exports and economic growth. What this means is that as more and more foreign earnings is derived from the oil exports there will be more income available to the government to provide infrastructure and other enabling environment to enhance productivity, which in turn accelerate the level of economic growth. The coefficient which is 0.5153 indicates that the degree of responsiveness of GDP to change in oil exports is elastic, that is, for every 1% increase in oil exports earnings, there will be over 51% increase in the GDP. The same result is gotten for non-oil exports, which also shows that there is a direct relationship between non-oil exports and GDP growth rate, though it is not significant. This means that though non-oil exports have positively impact on GDP, but they are insignificant. And for every 1% increase in the foreign exchange earnings from non-oil exports, there will be over 13% increase in the level of GDP.

There is positive relationship between importation of capital goods and the GDP in Nigeria. This relationship though statistically insignificant, depicts that the degree of responsiveness of GDP to change in importation of capital goods is elastic. Energy consumption as measured by energy used in the country shows that it is positively and insignificantly related to GDP. This means that as more and more energy is consumed, there will be increase in economic activities and this enhances productivity that would accelerate the level of economic growth. However, this is not so because the country's energy consumption is inadequate such that its contribution to the GDP can be overlooked.

Investment growth rate is inversely related to the level of economic growth in Nigeria. What this means is that as the level of investment increases, there will be reduction in GDP. The reason one will give to this is that the kind of investment that is being put in place is not a genuine one, that is, it is not productive, self sustaining and people's friendly. That is, investment in the real sector of the economy is not embarked upon while businesses in the non-productive sectors e.g. loans for the importation of consumer goods are striving.

Labour force also has a significant negative relationship with GDP. This means that the labour force is not productive because of the poor educational system, workers more than the available jobs, which lead to diminishing marginal productivity etc. in the country. The coefficient of capital indicates that it has a direct relationship with the GDP. Meaning that as more and more capital is acquired in the economy; this will accelerate productivity level and thereby increase the level of economic growth. The coefficient of determination, R^2 , shows that 98% of the changes that may occur in the GDP will be caused by the explanatory variables selected in this study. The standard error of the study is low, meaning that the estimates have goodness of fit, while the f-statistics show that the model is statistically significant to the study. And the measure of serial correlation (Durbin Watson) shows that there is little or no serial correlation in the model.

The result of the regression without natural logarithms is slightly different from the one with natural logarithm as capital goods importation is now negatively related to economic growth and it is statistically significant. Variables like non-oil exports, investment and capital are not statistically significant.

Table 3: ADF Test

Variable	Level	First Difference	Order of Integration
GDP	0.4715	-4.1555	I(1)
LOX	-0.9578	-7.1207	I(1)
LNOX	0.4509	-5.9071	I(1)
LCM	-0.8101	-7.1423	I(1)
LEC	-4.4433	-	I(0)
LINV	-3.7181	-	I(0)
LL	-2.0850	-4.4597	I(1)
LK	0.0653	-3.5714	I(1)

Note: the 5% critical value for the ADF statistics is approximately -3.6394 for levels and -2.9540 for first differences. These critical values are computed from Mckinnon (1996)

Table 3 above shows the stationarity test result and it indicates that oil exports, non-oil exports, capital goods importation as well as labour are stationary at their first difference, meaning that they are integrated of order one, i.e., I(1) variables. However, energy consumption and investment are stationary at their level, meaning there are I(0) variable.

Given that some of these variables are integrated of order one, while others are integrated of order zero, it is then necessary to know whether these variables could be used together in the model to get a reliable result. This we can do through the cointegration test. The result of the cointegration test could be seen in table 4 below. From the table, it is shown that the variables are cointegrated, given that the trace and maximum Eigen statistics are greater than the 5% level of significance in two different times, which means that there are two cointegrating equations or vectors in the model. Thus, this result established long run relationship in the model.

Table 4: Cointegration

Ho:	H ₁	Trace Statistics	5% Critical Value	Max-Eigen Statistics	5% Critical Value
r= 0	r=1	185.7660*	124.24	66.4236*	45.28
r≤ 1	r=2	199.3424*	94.15	51.7856*	39.37
r≤ 2	r=3	67.5568	68.52	30.5522	33.46
r≤ 3	r=4	37.0045	47.21	18.6695	27.07
r≤ 4	r=5	18.3351	29.68	13.1489	20.97
r≤ 5	r=6	5.1861	15.41	4.7339	14.07
r≤ 6	r=7	0.4522	3.76	0.4522	3.76

* denotes rejection of Ho at the 5% level
Source: Author's computation

Table 5: Impulse Response (GDP)

Variables	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
LOX	0.12	0.29	0.07	0.01	0.09	0.02	-0.07	-0.01	0.01	-0.01
LNOX	-0.03	-0.06	-0.03	0.02	-0.01	-0.05	-0.06	-0.02	0.02	0.05
LCM	-0.02	0.01	0.06	0.22	0.16	-0.01	-0.05	-0.03	-0.03	-0.01
LEC	-0.31	-0.03	-0.01	-0.07	0.01	-0.07	-0.13	-0.04	0.01	-0.01
LLA	-0.01	0.02	0.01	-0.01	0.01	0.01	-0.01	-0.01	-0.01	-0.01
LK	0.02	-0.06	0.06	0.15	0.03	-0.05	-0.03	-0.04	-0.04	0.01

Source: Author's computation

Table 5 above shows the impulse response result, which shows what will happen to the dependent variable (GDP) if there are shocks to the explanatory variables. The response of the GDP in ten different periods if there are shocks in the explanatory variables. Any shock in the oil-exports will lead to 12% change in the GDP in the first period, by the second period, it has gotten to 29% and in the tenth period, there had been negative response of GDP to oil export shock. Non-oil exports shock will have negative impact on GDP in most of the periods. Same result applies to all other explanatory variables in the model, that is. Any shock in them affects GDP negative.

Table 6: Granger Causality Test

Null Hypothesis	F-statistic	Prob.	Decision
LOX does not Granger cause LGDP	3.5126	0.0045	Reject
LGDP does not Granger cause LOX	6.8201	0.0039	Reject
LNOX does not Granger cause LGDP	0.1450	0.8656	Accept
LGDP does not Granger cause LNOX	4.8293	0.0041	Reject
LCM does not Granger cause LGDP	0.6289	0.5406	Accept
LGDP does not Granger cause LCM	4.4053	0.0217	Reject
LEC does not Granger cause LGDP	1.0232	0.3769	Accept
LGDP does not Granger cause LEC	1.2757	0.3000	Accept
LLA does not Granger cause LGDP	0.0229	0.9774	Accept
LGDP does not Granger cause LLA	0.7608	0.4774	Accept
LK does not Granger cause LGDP	1.6850	0.2044	Accept
LGDP does not Granger cause LK	4.9187	0.0151	Reject

Source: Author's computation

Finally, the result of the granger causality test shows that the direction of causality between oil export and GDP has bilateral or feed back effect causality. This means that as GDP causes changes in oil exports so also oil exports cause changes in GDP. However, for the direction of causality between non-oil exports and GDP, the result in table 6 shows that they have unidirectional causality from GDP to non-oil exports. This means that GDP causes change in non-oil exports but non-oil exports did not cause any change in GDP. For the causality between capital goods importation and GDP, we found that there is unidirectional causality between them from GDP to capital goods importation. That is, GDP causes change in capital goods importations while capital goods importation does not cause any change in GDP. However, for the direction of causality between energy consumption and GDP, and that of GDP with labour, the result shows that there are indifferent causalities. While the GDP causes change in the capital without capital causing any change in GDP.

IX. Conclusion and Policy Implications

This study intends to investigate the export-led growth hypothesis for Nigeria between the periods of 1970-2005. This is an update to the previous empirical studies that have been done in this area in Nigeria, especially that of Ekpo and Egwaikhide (1994). We have been able to show that pattern and structure of exports performance in Nigeria over the years. And we have seen from the literature that there are divergence opinions as to the direction of causality in the export-led growth hypothesis.

The ordinary least square (OLS) estimation technique has been used in this study, while the Augmented Dickey Fuller (ADF) stationarity test has been used to test the time series properties of the data. We have used the impulse response technique to show the effect of shocks in the explanatory variables on economic growth as measured by GDP. Furthermore, the Johansen cointegration test has been used to establish long run relationship in the model, while granger causality test has been used to test the export-led growth hypothesis.

We discovered from the study that all the variables used are $I(0)$ variables except energy consumption and investment that are $I(0)$ variables. The outcome of the cointegration test shows that there is long run relationship in the model and this result can be used for forecasting without loss of information in the long run. Thus, we found out from the causality test that there is feedback causality between oil export and GDP, while that of GDP and non-oil exports is unidirectional from GDP to non-oil exports. The impulse response result shows that except for oil exports shock that will have mostly positively impact on GDP; other explanatory variables will have indirect effect on GDP in most of the period. These results attested to the fact that both exports and GDP growth are important aspect of economic growth and development in Nigeria. Suggesting that the export promotion industrialization strategy of the government should be intensified since it has the potential and ability to translate into positive multiplier in the economy.

The emanating issues from the empirical results are that both oil and non-oil exports contributed to the enhanced economic growth that the country experience, however, the contributions of oil export is very relevant and significant to Nigeria's economic growth. Also, the GDP responded faster to increase in the foreign exchange earnings from oil export than that of the non-oil exports. The increase in capital goods import (which are used as inputs) have the potential of enhancing economic growth if the productive base of the economy is stimulated through provision of the necessary enabling environment for productive to strive. Furthermore, the energy consumption level in the country is inadequate such that it is insignificant to growth and investments are not channel to the productive sector(s) of the Nigerian economy.

Thus, outward oriented industrialization strategy of the government should be pursued more rigorously through the export promotion policy measures that would encourage the provision of enabling environment like adequate infrastructural facilities, reduction in trade and non trade barrier to investors so that it will motivate them to produce for exports, which will lead to sustainable growth and development in the country.

Therefore, an important implication of these findings for the Nigerian government and policymakers is that all efforts must be put in place to ensure that the country achieve high sustainable economic growth. This will lead to increased exports given the feedback or bidirectional causality that would further translate into high economic growth, and the cycle continues. Thus, government should embark on developmental policy that would encourage both export expansion and the enhancement of economic growth.

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