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Exports and Nigerian's Economic Growth: a Co-Integration Analysis

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Abstract

This research work employed the use of cointegration analysis in the study of export and economic growth in Nigeria. It was embarked on, in order to determine whether there is bi-directional relationship between exports and economic growth in Nigeria. More so, it tries to evaluate significant impact of exports on the economic growth in Nigeria. On the application of advanced econometric techniques like Augumented Dickey Fuller and Phillips Perron Unit Root Test, Johansen Cointegration Test and Error Correction Mechanism, the following information surfaced: - There existed a long-run relationship with economic growth and export in Nigeria. None of the variables were stationary at zero level. This means they all have unit roots. Having integrated the short run dynamics and long run equilibrium, Imports (IMP) and Exchange Rate were positively correlated with GDP while Exports (EXC) was negatively related with GDP. The short-run dynamics adjusts to the long-run equilibrium at the rate of 0.866% per annum. In the bid to achieve economic growth, it was recommended that there should be diversification of export commodities, infrastructure development, and maintenance of stable exchange rate and operationalization of Export Processing Zones.

Introduction

Background of the Study
Economic development is one of the main objectives of every society in the world and economic growth is fundamental to economic development. There are many contributors to economic growth. Export is considered as one of the very important contributors among them. There are also some concerns about the trade, especially between the primary and industrial goods exporting countries where the terms of trade are deteriorated against the poorer countries.

The debate on the relationship between export expansion and economic growth has exhibited considerable interest in the field of development economics. Several empirical studies have been conducted to assess the role of exports in the economic growth of developing countries from various aspects

(Michaely, 1977, Tyler 1981, Feder 1982). Most of the studies have concluded beneficial effects of export performance on economic growth such as;
1.   Increasing specialization and the spillover effects of the export sector's growth;
2.   Greater capacity utilization;
3.   The externality effect of exports in the diffusion of modern technology across other sectors and industries; and
4.   the increasing effects of economies of scale, industrialization, and import of capital goods.
Recalling Nigeria's exports during three periods; 1973-1978, 1979-1985 and 1987-1995, when market prices of oil in Nigeria's primary export went on a roller-coaster ride, the main feature of the first period was the dramatic rise in oil prices in 1973/74, which pushed Nigeria's real export earnings from N362 million in 1973 to N585 million in 1974, sending the terms of

trade index from 21 to 51. Part of this windfall was invested, so that between 1974 and 1978 investment increased massively, from N396 million to N670 million. The vagaries of the oil boom struck in1978; oil prices dropped and real export earnings declined from N564 million in 1977 to N520 million in 1979, but then in 1979/80 soared again sending real export earnings to N644 million. Prices fell again, however, and the volume of Nigeria's crude oil exports was cut in half. Real export earnings plunged from N644 million in 1980 to N261 million in 1983. Investment during this period also declined significantly, from N499million in 1980 to N121 million in 1984, but the change from military to civilian rule was a major factor in the drop as there was a shift in emphasis from investment to consumption. Imports were curtailed through licensing, increased duties and the introduction of an import deposit scheme. Inflation rose to more than 20% in 1981.

Structural adjustment was the major feature of the 1986-1995 periods. At the same time, real export earnings surged from N350 million in 1986 to N1, 098 million in 1990 because of the combined improvement of both oil and non-oil exports. Earnings then slipped to N1, 024 million in 1991, but rose to N1,051 million in 1992 as a result of the increase of price and volume of oil exports caused by the Gulf War. After 1992, however, real export earnings began to drop again. Real investment rose after 1986 and continued on this path until 1990, but did not match the levels achieved in the 1970s. The investment index was in triple digits in the 1970s (reaching as high as 215 in 1977); by contrast, it was in double digits in the 1980s and early 1990s, except for 1990 and 1993 when it reached 100 and 108, respectively.

Statement of the Problem
The capacity of trade to engineer growth in a developing country, especially Nigeria, has increasingly been undermined by the debilitating effects of fluctuations in exports. Obviously, Nigeria's export mainly primary products and often rely almost exclusively on only a limited number of commodities. Such exports are characterized by lower prices than manufactured goods plus highly volatile markets. Thus, Nigeria is often on the wrong

end of an unbalanced trade environment that favours the importing-usually developed-countries. When such imbalances cause fluctuations in export earnings, Nigeria's capacity to invest is inhibited, which in turn has an impact on overall economic growth. Hence, the needs to answer some important questions in this research study.

Objective of the Study
The general objectives of this study are
1. To determine whether there is bi-directional relationship between exports and economic growth in Nigeria.
2. To determine significant impact of exports on the economic growth of Nigeria.

Hypothesis of the Study
1. H_o: There is no bi-directional relationship between export and economic growth in Nigeria.
2. H_o: Exports do not have significant impact on the economic growth of Nigeria.

Significance of the Study
As the government of Nigeria is employing every possible technique to boost the economic growth of Nigeria, this study will act as a source of information on various ways of adopting effective measures of improving the productive sector. It will serve as a reference point to the policy makers to adequately plan export-led growth programmes. It will help students and researchers to do further work related to this research project. More so, institutions of learning that may come across this research work can see the need to advance means of promoting exports initiatives

Theoretical Literature
In the theories of economic growth, Neoclassical model stated that $Y= f (K, L)$ where Y represents the output, K is the capital while L is the Labour. This implies that capital and labour are the necessary factors of economic growth. However, to investigate the causality between the growth of exports and economic performance, this research study glances at the two models of Al-Yousif (1997) and Feder (1982). As stated by Al-Yousif (1997), the first model is the aggregate

production function type specification in which the level of exports along with labour and capital enters as inputs in the general production function as:

$Y = f(N, K, X)$........ (1)

where

Y is aggregate real output and N, K, and X represent labour, capital, and exports, respectively. By taking total differentials of (1), dividing through by *Y*, and manipulating the expression slightly, the growth equation is obtained as:

$Y = \beta_1 n + \beta_2 k + \beta_3 x$........... (2)

Since the rate of growth of capital is not known for the countries in this analysis, it can be replaced by dK/Y, which approximates the investment-income ratio. By adding a constant and stochastic term, (2) can be written as:

$Y = \beta 0 + \beta_1 n + \beta_2 (I/Y) + \beta_3 + \mu$...... (3)

Export and Economic Growth

Where β_1 and β_3 are elasticities of output with respect to labor and export and β_2 is the marginal product of capital. A positive and significant coefficient of the growth rate of export would indicate the positive effect of export expansion on economic growth.

The second model is in the framework of Feder (1982) in which the economy consists of two sectors: export and non-export. Also, the two sectors have different production functions. Output in both sectors is produced with labor and capital.   However, output in the export sector generates an externality effect in the non-export sector, such as efficient management and competitive environment, improved production techniques, better quality management and workers, and continuous flow of imported inputs. With these assumptions, Feder's model of economic growth can be shown as:

$Y = \beta_0 \% \beta_1 n + \beta_2 (I/Y) \% \beta_3 x(X/Y) + \mu$ .. (4)

The parameter $\beta 3$ captures two effects: higher input productivity in the export sector and positive externality effect of the export sector output on the non-export sectors of the economy.

Exports of goods and services are said to be an important source of foreign exchange that ease the pressure on the balance of payments and create employment opportunities. Generally export activities are said to stimulate economic growth in a number of ways such as; through production and demand linkages, and economies of scale due to larger international markets. Further increased efficiency and adoption of advanced technologies embodied in foreign-produced capital goods, learning effects and improvement of human resources and increased productivity through specialization (Were et al, 2002). Export-led Growth is said to be an economic development strategy in which export expansion plays a central role in a country's economic growth.

The extensive literature concerning the relationship between trade and growth is also the consequence of the many changes that have taken place in the fields of development economics and international trade policy in the last two decades. An example of these changes is the tremendous modification from inward oriented policies to export promotion (EP) strategy.

By the early 1980s export-led orientation and export promotion had already secured a wide consensus among researchers and policy makers, to such an extent that they had become "conventional wisdom" among most economists in the developing world (Tyler, 1981; Balassa, 1985). This is still the case in some international organizations, the international bank community and multilateral lenders such as the World Bank and the International Monetary Fund (IMF), and among the mainstream policy makers.

The advocates of the export-led strategy and free trade point out that most developing countries that followed inward oriented policies under the import substitution strategy (ISS), mostly in Latin America, had poor economic achievements (Balassa, 1980). Some of them showed on average a complete lack of growth, while real income declined between 1960 and 1990 (Barro and Sala-i-Martin, 1995).

These facts were partly responsible for the substantial change that occurred in the trade literature in the 1980s. For example, Bruton (1989) states that as the first stage of import substitution came to an end, those countries that

continued with this strategy, particularly in Latin America, or that were unable to shift to a more outward approach became increasingly vulnerable to external events. Most of them became increasingly dependent on short-run capital inflows, in particular from private banks, in order to maintain their levels of imports and thus of consumption. This was particularly the case of most Latin American countries that were greatly affected by the debt crisis of the early 1980s.

Thereafter, many Less Developing Countries (LDCs) were forced to stimulate their export-led orientation even more because most of them had to rely on multilateral organizations to implement adjustment and stabilization programmes to correct imbalances in their basic macroeconomic indicators. The strategy was to encourage a free market through policies that relied heavily on the export promotion approach as one of the most suitable and trustworthy mechanisms. Promoting exports would enable DCs to correct imbalances in the external sector and at the same time assist them in ensuring that their domestic economies made a full recovery.

As part of an outward strategy, a new set of policies rapidly became a key component for policy makers in DCs involved in adjustment and stabilization programmes. In this atmosphere, numerous Governments started at this time to stimulate exports using diverse mechanisms and instruments, such as subsidies and tax exemptions.

Consequently, by the mid-1980s, the economic literature concerning development economics, economic growth, adjustment and stabilization programmes had quickly rejected the inward-oriented approach and was suddenly placing great emphasis on export-led strategy. Most macroeconomic theorists and policy makers in DCs rapidly embraced the new wisdom, in the belief that by following this scheme their countries would achieve or regain the high rates of growth of the past.

Each strategy has been subject of an extensive theoretical survey and that the literature examining the relationship between trade and growth has increased substantially in the last decade with the impetus provided by the endogenous growth theory. However, it is not the intention of the present study to participate in or contribute to the discussion concerning the advantages and disadvantages of both economic strategies, which recently gained a new impetus (Bruton, 1998; Edwards, 1998; Frankel and Romer, 1999; Rodrik, 1999).

In addition, although the theoretical literature has frequently focused on the relationship between trade and economic growth (Adams, 1973; Crafts, 1973; Edwards, 1992; Scott, 1992), the interesting phenomenon is that "empirical examinations have typically examined the relationship between exports and growth" (Levine and Renelt, 1992, p. 953).

Therefore, the next section briefly reviews the empirical literature related to the export-led strategy, considering in particular the role that exports played in output growth and paying close attention to the issue of causal links between exports and economic growth.

Exports and growth
According to the so-called new orthodoxy, most authors as well as multilateral institutions would agree that promoting exports and achieving export expansion are beneficial for both developed and DCs for many reasons, including the following (i) they generate a greater capacity utilization; (ii) they take advantage of economies of scale; (iii) they bring about technological progress; (iv) they create employment and increase labour productivity; (v) they improve allocation of scarce resources throughout the economy; (vi) they relaxed the current account pressures for foreign capital goods by increasing the country's external earnings and attracting foreign investment; and (vii) they increase the TFP and consequently the well-being of the country (World Bank, 1993).

Export promotion strategies
Export promotion strategies are part of trade promotion and should focus on enterprise, industry, and national levels.

(a) Enterprise level
Some parts of the business community in developing countries have been unable to

significantly increase export volumes on their own for the following reasons:

i. A limited number of commodities are available for export, so export sectors depend on international developments affecting the world market. An example is the falling price of cotton and base metals that are a major part of export earnings for Central Asia.

ii. Industrial production of goods is limited by the lack of downstream activities, which does not allow enterprises to produce differentiated products for export or provide some form of export diversification.

iii. There is dependence on one or two key export markets and supply sources, and this does not give enterprises an opportunity to develop products according to the standards of more developed markets. This also results in lack of knowledge about marketing abroad.

iv. Enterprises lack export readiness, which might be due to unwillingness to venture overseas because the domestic market offers comfort and security. However, the transition to a market economy may force enterprises to look beyond the domestic market in order to earn much-needed foreign exchange and generate employment. International marketing is a much more complicated process than marketing and selling in a domestic economy.

Transitional economies need a lead agency to drive the effort towards becoming exporters. Industry level: Two kinds of export dimensions to consider are (a) increasing the export of existing products and (b) developing new exportable products.

Increasing the exports of existing products means looking at what industries currently produce for export to the world market. For many transitional and emerging economies, exports are mainly commodity and primary products. Therefore an initial export strategy should focus on enhancing and consolidating the volume of export into existing markets as well as diversifying to other exports markets (Boltho, 1996).

The second dimension involves making an assessment of what new products could be developed for export markets. These new products often originate from spin-offs or downstream activities from existing core industries. For example, the oil industry supports petrochemical industries and oil equipment manufacturing. Therefore, governments could help develop an industry to become ready overall for exporting through industrial cluster planning.

Industry councils or associations can play a major role by advising and working with the government or its designated trade body to develop export strategies. These strategies should be based on comprehensive study of the export potential for select products. This will involve:

- Clear identification of what is produced, planned production in the near future and the most suitable markets for such products;
- Concurrent study of what is being purchased in foreign markets in order to suggest what could be produced in the country to satisfy the needs and opportunities of foreign markets;
- Clear indication of constraints or problems for exports in terms of production or market conditions, which should lead to recommendations about how to solve problems or counteract any constraints.

National level
The government sets the overall economic direction and trade development strategy. Establishing the export dimension of this strategy in terms of appropriate economic instruments and export promotion measures is critical to national export performance. Therefore, the design of relevant trade policies is the key to a successful national export promotion programme.

Importance of export promotion and development strategies
An important component of a country's foreign trade policy is its national export strategy. The national export strategy focuses on promoting and developing those products and markets that offer the best opportunities for a country

(World Bank, 2003). Given the lack of available human and financial resources, it is almost impossible for a country to have a strategy covering all products simultaneously. The national export strategy should be considered as part of foreign trade policies. Formulation and implementation of a national export strategy requires:

i. A mechanism to co-ordinate policy formulation,
ii. Active participation and a sense of responsibility by the various bodies, institutions and officials involved,
iii. Persistent application of regulations, since frequent changes in regulations can be the one factor that is most detrimental to the success of export promotion and development programmes.

Basis of national export strategy
A national export strategy should be based on a comprehensive study of the country's export potential. This will involve:

. Clear identification of what is produced, planned production in the near future and the most suitable markets for such products;
. Concurrent study of what is being purchased in foreign markets in order to suggest what could be produced in the country to satisfy the needs and opportunities of foreign markets;
. Clear indication of constraints or problems for exports in terms of production or market conditions, which should lead to recommendations about how to solve problems or counteract any constraints.

Proper analysis will define the extent and focus of the strategy in the short, medium and long-term periods. Export promotion and development can succeed through orderly distribution of responsibilities, adequate co-ordination of policies at the formulation and implementation stages and definition of an appropriate and realistic strategy.

The role of trade promotion organizations in export promotion
Governments establish TPOs to develop and implement the country's export promotion and development programmes. TPOs normally have a dual role: (a) to provide specialized support to the producers of products for export, and (b) to serve as a catalyst for related services provided by other entities in the public and private sectors.

A TPO acts as adviser to the government on foreign trade and related matters. Due to the nature of its services, the TPO and the export community should develop close ties. This will give the TPO an opportunity to have first-hand knowledge of policies and procedures that support (or hinder) the development of exports. In this way, the TPO also acts as a bridge between the export community and the government.

The TPO can also be an effective bridge between the export community and the foreign markets, if it can call on the services of other specialized institutions. In this way, the TPO also serves as a catalyst for the use of specialized services. It is also possible for the export community to establish direct contacts with foreign markets and with the government through channels other than the TPO. However, these other contacts should not prevent the TPO from acting for the benefit of exporters.
Export promotion and development activities should be carried out by specialized institutions devoted to this task. This makes the TPO a key actor, which receives support and relies on other specialized institutions.

Export-led growth and economic growth
Theoretically, export-led growth appears among neoclassical economists after the victorious story of newly industrialized Asian countries. They argue that, for instance, Taiwan, Hong Kong, Singapore and Korea, the Four Asian Tigers, have been successful in achieving high and persistent rates of economic growth since early 1960s; because of their free-market, outward-oriented economies (World Bank, 1993).

However, the authenticity of the tigers does not support this analysis. The production and composition of export was not left to the market but resulted as much from carefully planned intervention by the governments. As Amsden (1989) analyzed that the philosophy behind the emergence of this new 'Asian Tigers' is a strong, which has deliberately and abundantly provided tariff subsidies and

protection, change in exchange rates, management investment, and restricted industry using both lucrative encouragement and threatening sticks.

Now the issue is how a country can attain economic growth which is one of the essential economic questions for policy makers. An export-led growth scheme which affirms that exports is the key to support economic growth and provides one of the answers to this basic question. Exports are the most important source of foreign exchange, which can be used to ease pressure on the balance of payments and generate job opportunities in developing countries like Pakistan. According to Abou-Stait (2005), an export-led growth strategy aims to offer producers incentives to export their goods through various governmental policies. The tactic also aims at increasing the capability of producing goods that can compete in the world market using advanced technology and make provision for foreign exchange needed to import capital goods.

Exports can help the country to integrate in the world economy and to reduce the impact of external shocks on the domestic economy. Exports allow domestic production to achieve a high level of economies of scale. Tsen (2006) stated that the experiences of East Asian economies provide good examples of the importance of the sector to economic growth and development, and this emphasizes the role of exports as an engine for economic growth.

Empirical Literature Review
Darrat (1986) worked on four Asian (Hong Kong, South Korea, Singapore, and Taiwan) countries and found no evidence of uni-directional causality from exports to economic growth in all the four economies. In the case of Taiwan, however, the study detected unidirectional causality from economic growth to export growth.

Erfani (1999) examined the causal relationship between economic performance and exports over the period of 1965 to 1995 for several developing countries in Asia and Latin America. The result showed the significant positive relationship between export and economic growth. This study also provides the

evidence about the hypothesis that exports lead to higher output.

Vohra (2001) showed the relationship between export and growth in India, Pakistan, the Philippines, Malaysia, and Thailand for 1973 to 1993. The empirical results indicated that when a country has achieved some level of economic development, the exports have a positive and significant impact on economic growth. The study also showed the importance of liberal market policies by pursuing export expansion strategies and by attracting foreign investments.

Subasat (2002) investigated the empirical linkages between exports and economic growth. The analysis suggested the more export oriented countries like middle-income countries grow faster than the relatively less export oriented countries .The study also showed that export promotion does not have any significant impact on economic growth for low and high income countries.

Balaguer (2002) examined the hypothesis of export-led growth from the Spanish trade liberalization process initiated four decades ago, for 1961 to 2000. Both the export expansion and the progression from "traditional" exports to manufactured and semi-manufactured export are considered for this purpose. It is proved that the structural transformation in export composition has become a key factor for Spain's economic development along with the relationship between export and real output.

Njikam O. (2003) determined the role of exports in economic growth by analyzing Namibia's data from 1968 to 1992. Results explained the general importance of exports, but find no discernible sign of accelerated growth because of exports.
Lin (2003) stated that ten percent increase in exports cause one percent increase in GDP in the 1990s in China on the basis of new proposed estimation method, when both direct and indirect contributions are considered.

Shirazi (2004) studied the short run and long run relationship among real export, real import and economic growth on the basis of co-integration and multivariate Granger causality

developed by Toda and Yamamoto (1995) for the period 1960 to 2003.This study showed a long-run relationship among import, export and economic growth and found unidirectional causality from export to output but did not find any significant causality between import and export.

Mah (2005) studied the long-run causality between export and growth with the help of significance of error correction term, ECt-1. This study also indicated that export expansion is insufficient to explain the patterns of real economic growth.

Tang (2006) stated that there is no long run relationship among export, real Gross Domestic product and imports. This study further shows no long-run and short-run causality between export expansion and economic growth in China on the basis of Granger causality while economic growth does Granger-cause imports in the short run.

Jordaan (2007) analyzed the causality between exports and GDP of Namibia for the period 1970 to 2005. The hypothesis of growth led by export is tested through Granger causality and cointegration. It tests whether there is uni-directional or bi-direction causality between export and GDP. The results revealed that exports Granger cause GDP and GDP per capita and suggested that the export-led growth strategy through various incentives has a positive influence on growth.

Pazim (2009) tested the validity of export-led growth hypothesis in three countries by using panel data analysis. It is concluded that there is no significant relationship between the size on national income and amount of export for these countries on the basis of one-way random effect model. The panel unit root test shows that the process for both GDP and Export at first difference is not stationary while the panel co-integration test indicates that there is no co-integration relationship between the export and economic growth for these countries.

Summary of Findings from the Empirical Literature Review
Based on the empirical findings sought by the reviewed works, the following summaries are

made;
- Darrat (1986) found no evidence of uni-directional causality from exports to economic growth in all the four economies.
- In the study of Erfani (1999), exports lead to higher output.
- Vohra (2001) indicated that when a country has achieved some level of economic development, the exports have a positive and significant impact on economic growth.
- Subasat (2002) investigation showed that export promotion does not have any significant impact on economic growth for low and high income countries.
- Results of Njikam O. (2003) explained the general importance of exports, but find no discernible sign of accelerated growth because of exports.
- In the study of Shirazi (2004), there is a long-run relationship among import, export and economic growth and found unidirectional causality from export to output but did not find any significant causality between import and export.
- Based on the findings of Mah (2005) export expansion is insufficient to explain the patterns of real economic growth.
- In the study of Tang (2006) it shows no long-run and short-run causality between export expansion and economic growth in China on the basis of Granger causality while economic growth does Granger-cause imports in the short run.
- Pazim (2009) concluded that there is no significant relationship between the size on national income and amount of export for these countries on the basis of one-way random effect model.

Short-Comings of the Previous Study
Darrat (1986) failed to conduct causality test on the whole economies of Asian countries. This inefficiency contributed to the result found which stipulated that there was no evidence of uni-directional causality from exports to economic growth in all the four economies.

In the work of Erfani (1999), the result showed that there is significant positive relationship

between export and economic growth. This study also provides the evidence about the hypothesis that exports lead to higher output. However, the study limited the period of observation from 1965 to 1995 for several developing countries in Asia and Latin America.

Vohra (2001) showed the relationship between export and growth in India, Pakistan, the Philippines, Malaysia, and Thailand for 1973 to 1993. However, he failed to examine the factors that promote export in the economies of the studied countries.

Pazim (2009) tested the validity of export-led growth hypothesis in three countries by using panel data analysis. He did not observe the analysis on time-series data. Hence, the conclusion that there is no significant relationship between the size on national income and amount of export for these countries on the basis of one-way random affect model.

Jordaan (2007) did not undertake Error Correction Mechanism (ECM) to integrate the short run dynamics with the long run equilibrium. He only analyzed the causality between exports and GDP of Namibia for the period 1970 to 2005. The hypothesis of growth led by export is tested through Granger causality and cointegration.

Model Specification

In this study, hypothesis has been stated with the view of examining the causality between export and economic growth in Nigeria. Also, it evaluates the impact of exports on the economic growth of Nigeria. In capturing the study, these variables were used as proxy. Thus, the model is represented in a functional form. It is shown as below:

GDP = F (EXP, IMP, EXR)…………. 3.1

Where

GDP = Gross Domestic Product (Dependent variable)

EXP = Exports (Independent variable)

IMP =   Imports (Independent variable)

EXR=   Exchange rate (Independent variable)

In a linear function, it is represented as follows,

$GDP = b_0 + b_1 EXP + b_2 IMP + b_3 EXR + U_t$ …3.2

Where

b_0 = Constant term

b_1 = Regression coefficient of EXP

b_2 = Regression coefficient of IMP

b_3 = Regression coefficient of EXR

U_t = Error Term

Estimation Procedure

At this level of research, using time series data, the researcher estimates the model with ordinary least square method. This method is preferred to others as it is best linear unbiased estimator, minimum variance, zero mean value of the random terms, etc (Koutsoyiannis 2003).

In the preliminary test, the following tests shall be conducted. They include:

Z-test

Unit root test

Co-integration test

Error Correction Mechanism

Z-test: It is used to test for the statistical significance of individual estimated parameter. In this research, Z-test is chosen because the population variance is unknown and the sample size is greater than 30.

Decision Rule

If Z-cal > Z-tab, reject the null hypothesis and conclude that the regression coefficient is statistically significant. Otherwise accept the null hypothesis.

Unit Root Test: It is used to test for the stationarity of the time series data. Augmented Dickey fuller will be used in the process. In considering the levels the data could be said to be integrated of, Augmented Dickey fuller (ADF) test statistics shall be compared with the critical values at 5% level of significance. A situation whereby the (ADF) test statistics is greater than the critical values with consideration on the absolute values, the data at the tested order will be said to be stationary. Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternative hypotheses of stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. The general form of (ADF) test is estimated by the following regression.

$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum \alpha \Delta y_i + \varepsilon$ ..... *(3.3)*

$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum \alpha_1 \Delta y_i + \delta_t + \ldots\ldots(3.4)$

Where:

Y is a time series, t is a linear time trend, Δ is the first difference operator, such that $\Delta y_{t-1} = y_t - y_{t-1}$, $\alpha 0$ is a constant, n is the optimum number of lags in the dependent variable and ε_t is the random error term.

The null hypothesis is that $\alpha_1 = 0$. If the null hypothesis $\alpha_1 = 1$, then we conclude that the series under consideration $\Delta(y_t)$ has a unit root and is therefore non-stationary.

If the ADF test fails to reject the test in levels but rejects the test in first differences, then the series contains one unit root and is of integrated order one I (1). If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains two unit roots and is of integrated order two I(2).

The Philip- Perron (PP) Unit Root Test is implemented to justify the results ADF test. The equation is thus:

$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots(3.6)$

Co–Integration Test: It is used to test for the long run relationship between the variables. And a long run relationship is found on these variables in which we will study. Johansen Co-integration Approach will be undertaken by the researcher in the course of the analysis. Hence, the use of Johansen Co-integrating Normalized coefficients to ascertain the nature of the long run relationship between the estimated variables. Engel and Granger (1987) pointed out that a linear combination of two or more non-stationary variables may be stationary. If such a stationary combination exists, then the non-stationary time seriesare said to be co-integrated. The VAR based co-integration test using the methodology developed inJohansen (1991, 1995).

Johansen's methodology takes its starting point in the vector auto regression (VAR) of order P given by

$y_t = \mu + \Delta_1 y_{t-1} + \text{-----------} \Delta p \; y_{t-p} + \varepsilon_t$

Where

Y_t is an nx1 vector of variables that are integrated of order commonly denoted (1) and ε_t is an nx1 vector of Exports.

This VAR can be rewritten as

$\Delta y_t = u + \eta y_{t-1} + \sum t_i \Delta y_{t-1} + \varepsilon_t$

To determine the number of co-integration vectors, Johansen (1988, 1989) and Johansen and Juselius (1990) suggested two statistic test, the first one is the trace test (λ trace). It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives q = r. the test calculated as follows:

λ trace (r) = $-T \sum \ln (1 - \lambda_t)$

Where

T is the number of usable observations, and the $\lambda_{1,s}$ are the estimated eigenvalue from the matrix.

The Second statistical test is the maximum eigenvalue test (λ max) that is calculated according to the following formula

λ max (r, r + 1) = -T ln (1 − λr + 1)

The test concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r + 1 co-integrating vector.

Error Correction Mechanism (ECM): The purpose of the error correction model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long-run equilibrium.

The ECM (p) form is written as:

$\Delta y_t = \delta + \rho y_{t-1} + \sum_{i=1}^{p} \Phi_i^* \Delta y_{t-1} + \varepsilon \ldots\ldots (3.7)$

Where Δ is the differencing operator, such that $\Delta y_{t-1} = y_t - y_{t-1}$.

Sources Of Data

The data for this research project are obtained from the following sources:

- Central Bank of Nigeria Statistical Bulletin for various years.
- Central Bank of Nigeria Annual Account for various years.
- Central Bank of Nigeria Economic and Financial Review for various years.

Presentation and Analysis of Results

The aim to determine whether there is bi-directional relationship between exports and economic growth in Nigeria and also to determine if there is significant impact of

exports on the economic growth of Nigeria led the researcher to subject the data collected to Granger Causality test, Unit Root, Cointegration, and Error Correction tests. The results and their discussions are presented hereunder.

Granger Causality Test

In examining the pair-wise (bi-directional) relationship among the variables, 5% level of significance and 3 and 34 degrees of freedom, the f-tabulated value is 2.88. Considering the f-calculated value of EXP and GDP, there is no two way causation between Exports and GDP.

This implies that both variables do not granger cause each other. However, it is found that there is one way causation between the following variables; Exchange Rate (EXR) and GDP, Imports (IMP) and Exports (EXP), Exchange Rate (EXR) and Exports (EXP) and Exchange Rate (EXR) and Imports (IMP).

Unit Root Test

The Augmented Dickey-Fuller (ADF) and Philip Perron (PP) formulae were employed to test for stationarity or the existence of unit roots in the data. The test results are as presented below:

Augmented Dickey Fuller Unit Root Test
Trend and Intercept

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Lag	Remarks
GDP	-5.823710	-3.5312	-3.1968	1(1)	0	Stationary
EX	-4.750840	-3.5312	-3.1968	1(1)	0	Stationary
IMP	-6.922818	-3.5312	-3.1968	1(1)	0	Stationary
EXR	-5.554115	-3.5312	-3.1968	1(1)	0	Stationary

Phillips-Perron Unit Root Test
Trend and Intercept

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Lag	Remarks
GDP	-5.823710	-3.5312	-3.1968	1(1)	0	Stationary
EX	-4.750840	-3.5312	-3.1968	1(1)	0	Stationary
IMP	-6.922818	-3.5312	-3.1968	1(1)	0	Stationary
EXR	-5.554115	-3.5312	-3.1968	1(1)	0	Stationary

Augmented Dickey Fuller Unit Root Test
Intercept

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Lag	Remarks
GDP	-5.424104	-2.9399	-2.6080	1(1)	0	Stationary
EX	-4.160231	-2.9399	-2.6080	1(1)	0	Stationary
IMP	-4.996239	-2.9399	-2.6080	1(1)	0	Stationary
EXR	-5.240045	-2.9399	-2.6080	1(1)	0	Stationary

Phillips-Perron Unit Root Test
Intercept

Series	ADF Test Statistic	5% critical values	10% critical values	Order	Lag	Remarks
GDP	-5.424104	-2.9399	-2.6080	1(1)	0	Stationary
EX	-4.160231	-2.9399	-2.6080	1(1)	0	Stationary
IMP	-4.996239	-2.9399	-2.6080	1(1)	0	Stationary
EXR	-5.240045	-2.9399	-2.6080	1(1)	0	Stationary

The above empirical test shows that GDP, EX, IMP and EXR are integrated of order one. They are integrated of the same order; 1(1). From the above tables, it was found that both ADF and PP Test with trend and intercept, and ADF and PP with intercept indicated that time series are integrated of the same order. The linear combination of series integrated of the same order are said to be cointegrated. The level of their integrations indicates the number of time series have to be differenced before their stationarity is induced. Considering the ADF and PP test statistics at 5% and 10% critical values, it is observed that test statistics are greater than the critical values. Thus, the series are said to be stationary at that level.

Co-Integration Test

The Likelihood Ratio is higher than 5% critical value and the eigenvalues are found as (0.784413, 0.697620, 0.498410 and 0.320708). The Likelihood Ratio of GDP, EX, IMP and EXR are greater than the critical values at both 5% and 1% level of significance. Also, the Eigenvalues of GDP, EX, IMP and EXR are significantly greater than zero. In other words, the null hypothesis of no cointegration among the variables is rejected in at least four equations. The test result shows the existence of a long-run equilibrium relationship in the four cointegrating equations at 5% significance level.

The normalized cointegrating coefficients for one cointegrating equation given by the long-run relationship is
GDP= -8698.964 − 0.090018 EX + 0.129283 IMP − 1214.077 EXR

$$(0.01692)$$
$$(0.03354) \qquad (490.877)$$

where GDP is the dependent variable, -8698.964is constant, -0.09 is the coefficient of Exports (EX), 0.13 is the coefficient of Imports (IMP) and -1214.08 is the coefficient of Exchange Rate (EXR). The figures in parenthesis under the estimated coefficients are the asymptotic standard errors. The values in this relationship were extracted from the Johansen's Cointegration Test under the "Normalized Cointegration Coefficients: 1 Cointegrating Equation" sub-section. They are coefficients showing the direction and strength of the relationship between the explanatory

variables and dependent variable in the long-run.

From the above equation,the constant value is -8698.964 indicating that the average level in the Gross Domestic Product (GDP) in Nigeria is approximately -8698.964 units when other variables are zero. The sign of the constant value is negative which means that the proportion of the Gross Domestic Product (GDP) in Nigeria tends to decrease, keeping other variables constant in the long-run. It is found that a unit increase in Exports (EX) and Exchange Rate (EXR) on the average will lead to a decrease by 0.09 and 1214.08 units in the Gross Domestic Product (GDP) respectively. However, it is found that a unit increase in Imports (IMP), will lead to increase by 0.13 units in GDP on the average.

Worthy of note is the signs borne by the coefficient estimate of Exports (EX) and Imports (IMP). Obviously, the sign seem to violate the economic a priori expectations. However, some factors could be considered in the estimated results. According to new orthodoxy perception, promoting exports and achieving export expansion are beneficial for both developed and DCs for many reasons, including the following (i) they generate a greater capacity utilization; (ii) they take advantage of economies of scale; (iii) they bring about technological progress; (iv) they create employment and increase labour productivity; (v) they improve allocation of scarce resources throughout the economy; (vi) they relax the current account pressures for foreign capital goods by increasing the country's external earnings and attracting foreign investment; and (vii) they increase the TFP and consequently the well-being of the country (World Bank, 1993) but could as be seen with its results to be clearly contradictory for both DCs and industrialized economies.

The exchange rate instability is one of the factors which affect the relationship between exports and economic growth in the long-run. This is evident from the result and Nigeria's environment. For example, Catão (1998) indicated that the size of the export sector was very small and had weak linkages with the rest of the economy. Thus, it is unlikely that

exports could have propelled the domestic sector of the Mexican economy. Porter (1978) and Balassa (1978) claimed that the positive effects of exports flourish only after countries have achieved a certain level of economic development. Else, unindustrialized means of production can negate the relationship of exports with GDP in the near future. Thus, it is observed that when the exports negate with the GDP in the long run, imports will be on the increase.In any case, the existence of a long-run cointegrating equilibrium also provides for short-term fluctuations. In order to straighten out or absolve these fluctuations, an attempt was made to apply the Error Correction Mechanism (ECM).

Error Correction Model (Ecm)
As noted, the ECM is meant to tie the short-run dynamics of the cointegrating equations to their long-run static dispositions.

The ECM Test for the Given Data

Dependent Variable: LOG(GDP)				
Method: Least Squares				
Date: 08/07/11 Time: 06:27				
Sample(adjusted): 1972 2009				
Included observations: 38 after adjusting endpoints				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.179116	1.834005	4.459702	0.0001
LOG(EX)	-0.533241	0.450904	-1.182603	0.2454
LOG(IMP)	0.868711	0.403093	2.155116	0.0385
LOG(EXR)	0.106320	0.256922	0.413821	0.6817
ECM(-1)	-0.008636	0.011219	-0.769764	0.4469
R-squared	0.695596	Mean dependent var		11.99239
Adjusted R-squared	0.658699	S.D. dependent var		1.318795
S.E. of regression	0.770453	Akaike info criterion		2.438403
Sum squared resid	19.58872	Schwarz criterion		2.653875
Log likelihood	-41.32965	F-statistic		18.85218
Durbin-Watson stat	0.317585	Prob(F-statistic)		0.000000

In order to absolve the short-run dynamics of the relationships, the Granger Representative Theorem (GRT) holds that a negative and statistically significant error correction coefficient is a necessary condition in the model. In this case, the error correction coefficient is -0.008636. The negative sign of the coefficient satisfies one condition while the fact that 0.695596 is different from zero satisfies the second condition of statistical significance. The coefficient reveals that the speed of adjustment between the short-run and long-run realities of the cointegrating equations is 0.86% every year.The computedR^2value of 0.695596 which is the coefficient of determination indicates that the model satisfies the requirements for goodness of fit. The value shows that 69.56% of the total variations in the economic growth (GDP) are adequately explained by changes in Exports (EXP), Imports (IMP) and Exchange Rate (EXR).

More so, the joint influence of the explanatory variables on the dependent variable is statistically significant. This is also confirmed by the F-probability which is statistically zero.

Finally, the results of the study do provide support for the hypotheses that Exports have significant impact on the economic growth of Nigeria between the periods under study.

Summary of Findings
This research work tries to study exports and Nigeria's economic growth from 1970 to 2009. In the specified model, Gross Domestic Product (GDP), Exports (EXC), Imports (IMP) and Exchange Rate (EXR) were captured.

On the application of advanced econometric techniques (Augmented Dickey Fuller and Phillips Perron Unit Roots, Johansen Cointegration Test, and Error Correction Mechanism), the following information surfaced;

(i) None of the variables was stationary at zero level. This means they all have unit roots;

(ii) The four variables became stationary at first difference by ADF and PP application.

(iii) There exists a long-run equilibrium relationship between Exports and economic growth in Nigeria within the period under study.

(iv) In the Error Correction Model (ECM), Imports (IMP) and Exchange Rate were positively correlated with GDP while Exports (EXC) was negatively related with GDP.

(v) The joint influence of the explanatory variables is statistically significant. This was very well echoed by the F-statistics which tested the entire regression plane.

(vi) The short-run dynamics adjusts to the long-run equilibrium at the rate of 0.86% per annum.

Recommendation

In the light of the researcher's findings, the following recommendations are presented;

- In the bid to achieve economic growth, there should be diversification of export commodities, infrastructure development, and maintenance of stable exchange rate and operationalization of Export Processing Zones.

- Nigeria's government should uphold the importance of liberal market policies by pursuing export expansion strategies and by attracting foreign investments.

- There should be structural transformation in export composition as it has become a key factor for economic development along with the relationship between export and real output.

- The export development approach clearly requires more effort, resources, and persistence than the simple traditional export promotion approach. Hence, there is need for modern means of export promotion as this will help to enhance export activities in the country.

- Finally, in the era of growing globalization and trade liberalization, the importance of exports cannot be overemphasized. In this regard, Nigeria undoubtedly needs to become competitive to be able to curve a niche in the world market and realize its long–term goal of sustainable economic growth and development.

Conclusion

The study focuses on finding the long run relationship between Export and Economic growth in Nigeria. Granger Causality and Cointegration test were employed in the empirical analysis. Prior to the Cointegration test, it was tested for stationarity of the variables using Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP). The variable proved to be integrated of the order one 1(1) at first difference. Johansen and Juselius Cointegration test was used to determine the presence or otherwise of a cointegrating vector in the variables. Both Trace and Maximum Eigenvalue indicated existence of cointegration at 5% level of significance pointing to the fact that the variables have a long-run relationship.

Furthermore, the Pairwise Granger Causality was carried out to determine the direction of Causality among the variables, at least in the short run. Neither Economic growth which was proxied by GDP nor Export Granger Cause each other.

Export development is not only desirable, but also absolutely necessary in Nigeria in order to widen a narrow export base. Foreign exchange earnings from a very limited number of export products often cannot generate enough additional foreign exchange, especially when there has been exchange rate instability. Thus,

exchange rate stability should be considered as an important factor than can boost export.

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