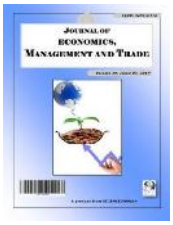

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Disaggregated Analysis of Foreign Trade Impact on Economic Growth; Reflecting on the Nigeria Experience

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

This study conducted a disaggregated analysis of foreign trade impact on economic growth using Nigeria historical data. The data used spans the period 1981-2017 on variables such as foreign trade decomposed into four components namely; oil import, oil export, non-oil import, and non-oil export. Others are GDP, aggregated government expenditure data and consumer price index. The variables were sourced from the Central Bank of Nigeria [CBN] Statistical Bulletin [latest edition] augmented with World Development Indicator [WDI], latest version and CBN Annual Report [various issues]. Models were formulated with and without recession dummy variable and estimated using (FMOLS) technique. Variables were tested and found to be non-stationary at level. They become stationary after first differencing, meaning that all variables exhibit a I[1] process. The group of I(1) variables were found to be cointegrated after testing for cointegration following a multivariate cointegration analysis proposed by Johansen and Juselius [20]. The result shows that non-oil trade has positive impact on growth while oil trade has negative impact on growth. The negative impact of oil trade declines marginally in recession period. Both government expenditure and consumer prices have significant positive impact on economic growth. This study strongly recommends that government in her effort to diversifying and repositioning the Nigerian economy should give urgent

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attention to the non-oil sector in order to boost trade in this sector to enhance economic growth. The study therefore concluded that foreign trade impact on economic growth in Nigeria depends largely on the magnitude of foreign trade resulting from non-oil export.

Keywords: Multivariate cointegration; oil trade; non-oil trade; economic growth; Nigeria.

1. INTRODUCTION

In a highly globalized world of today, trade is expected to play a major role in the economic development of any country or region. The regime of economic integration has prompted many countries of the world to open up their economies for trade in goods and services and also exchange of ideas, information and technology. Capital mobility has been accelerated through financial globalization. Capital poor nations have been able to receive capital for domestic investment from capital rich nations. By this the global economy has been better for it since capital moves easily from redundant zones to where it is needed to boost economic activities. The movement of capital from capital surplus nations to capital shortage regions has aided the efficient use of global economic resources.

There is increasing evidence in support of the popular slogan, "Trade not Aid in less Developed Countries." Trade has received more attraction than the use of Aid as a means of accelerating economic progress in less developed countries. There is no doubt that trade through international specialization has contributed significantly to the level of economic development experienced in most countries today. Most countries have been able to get goods they cannot produce from other countries and hence this has facilitated the quality of life and the overall standard of living across the globe. Efficient application of division of labour and specialization as put forward by Adam Smith, a foremost classical economics is determined by the size of the market. Large scale production reduces cost and improve the market competitiveness of the products, but market size is a great limitation to the application of division of labour with advantage of mass production which enable firms to enjoy all form of economies of scale. Trade has offered the modern world of today this great advantage. The size of the market has been widening to accommodate large production of goods and services by the firm beyond the capacity of the home market. Through trade, firms are not only producing for the domestic market but also for the foreign market. This has helped to a large extent to remove market limitation to the application of division of labour.

This market threat to large scale production is one of the reasons some state governors in Nigeria engaged in assuring farmers in their various states of ready-made market for their agricultural products such as cassava, yam, rice, maize, millet, cocoa, kolanut, etc., in whatever size their output might be. The farmers were assured of selling their products in the international market and that government would provide the logistic and moral support to facilitate this, so that the burden of insufficient demand would be lifted. Removing the market hurdles from all lines of production in the non-oil sector has boosted investment and productivity in this sector in the last few years. Foreign trade improves creativity and propensity to engage in research to enhance the quality of products to meet the changing needs of international market. This promotes a lot of research activities and innovation to improve quality of output from time to time. The nations of the world are able to experience high standard of living by being able to tap all the advantages associated with division of labour and specialization.

In today's world, China occupies a desirable position as the second largest economy following the United States of America, due largely to her desire to engage in foreign trade. The desire for economic growth is one of the major reasons why nations engaged in foreign trade. The success story of China in the recent time confirmed that trade is really a vehicle for economic growth. However, Ehinomen and Damilola [1] while sharing their view on trade-growth nexus noted that, the case of Nigeria today is a different story due to the instability of the economy as a result of high level of unemployment, unstable prices and adverse balance of payment, etc. This poses some doubt on the view that trade universally induces economic growth. Reflecting on the impact of trade on the economy, Giles and Williams [2] noted that the entire economy would benefit due to the dynamic spillover of the export sector growth, and that an increase in exports improves the balance of payment and enlarges the

increase of investment goods import and facilities necessary for the expansion in domestic production. Mike and Okojie (2012), while reflecting on trade-growth nexus in respect of the Nigerian economy noted that Nigeria is basically an open economy with international transactions constituting a significant proportion of her aggregate output. In the same vein, Ogbaji and Ebebe (2013) noted that the Nigerian government like many other developing countries considers trade as the main engine of its development strategies, because of the implicit belief that trade can create jobs, expand markets, raise incomes, facilitate competition and disseminate knowledge.

Foreign trade in this study has been decomposed into four, namely, oil import trade, oil export trade, non-oil import trade and non-oil export trade, all measured in billions of naira. They were however, transformed into their natural logarithm form. Economic growth is captured by natural logarithm of gross domestic product in billions of naira. Government expenditure was captured using aggregated government expenditure data also in billions of naira, while consumer price index was used to capture consumer prices. These other two variables were also transformed in to their natural logarithm form.

Fig. 1 presents the trend of economic growth, foreign trade variables, government expenditure and consumer prices. It shows the growth experienced by each of these variables between 1981 and 2017. It is obvious from the figure that each of the variables have a unique structure even though characteristically dominated by a kind of upward trend. For instance, GDP, government expenditure and consumer prices trended up more smoothly than any of the foreign trade variables. Oil export, non-oil export, oil import and non-oil import trended up and down along their growth path.

This study differs from prior studies by applying a cointegration approach to model the impact of foreign trade (disaggregated) on economic growth. This approach is quite rare even among studies that engaged in disaggregated analysis. This enables us to capture the component of foreign trade that is auspicious to growth and the component that is detrimental to growth after establishing a long-run equilibrium relationship between foreign trade and economic growth. The outcome would really guide policy maker to make an informed decision on which direction to go. The issue of whether foreign trade is harmful to growth can be taken with caution. The question should be which component of foreign trade is really bad and which is really good for growth. This study would shed further light on where should be the direction of trade and what the magnitude should be. Aside from this, the study also differ in the choice of control variables included across studies on trade-growth nexus. Government expenditure (aggregated) and consumer prices were used as control variables. The inclusion of these variables was unconnected with the fact that fiscal policy and consumer prices are very crucial in determining the growth rate of an economy. Market competitiveness and demand are key to business survival and growth.

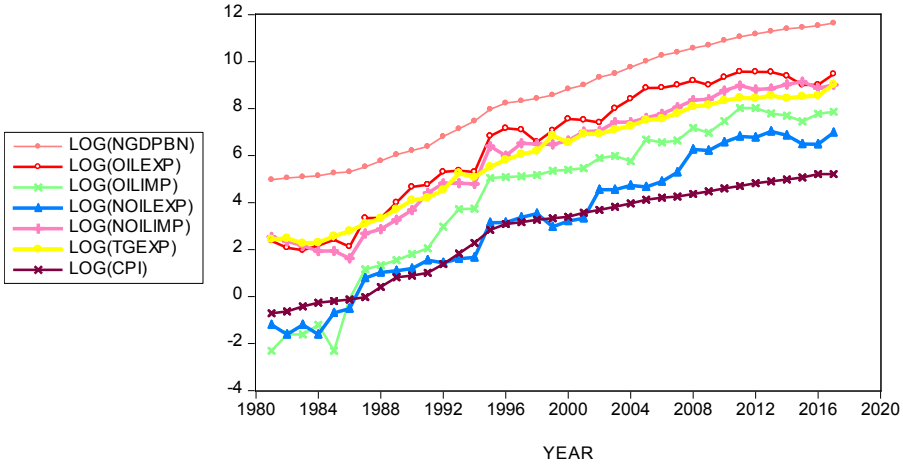

Fig. 1. Trend of foreign trade variables, government expenditure, consumer prices and economic growth in Nigeria (1981-2017)

In addition, this method covered 1981 to 2017, hence, the study included recession dummy variable in the models to account for the impact of the recent recession on the impact of trade on economic growth in Nigeria during the period. More importantly, the conclusion of this study is based on the result obtained from fully modified ordinary least square (FMOLS) estimation method. This estimation method has been scarcely used in the literature on trade-growth nexus in Nigeria. The study also tested the causal link between foreign trade variables and economic growth using the pairwise granger causality models.

The remaining part of this paper goes thus: Following the introductory section is section two which presents a brief review of literature both theoretically and empirically, section three which describes the data and econometric methodology adopted, section four which presents empirical results and section five which conclude the paper.

2. A BRIEF REVIEW OF RELATED LITERATURE

The transition from autarky state, a close economic system to a modern, systematically open economy is a common characteristic of many economies across the globe. This change becomes a necessary change as every nation of the world is attracted by the phenomenal benefits associated with trade. Today, the whole world is almost involved in international trade which is also known as foreign trade. No nation can exist as island without interacting with other nations. Trade has encouraged interdependency of nations and in large extent has promoted global peace and harmony. Peace as a matter of fact is a necessary condition for investment and output growth across the nations. By this, global output has drastically increased with all its attached welfare effects.

Theoretically, foreign trade is said to be beneficial to long-run economic growth from two perspectives. The first perspective is through gain from trade and the second is through gain from exchange. The evolution of trade could be traced to the age of mercantilism as called in Britain or colbertism as called in France or as cameralism as in Germany. The doctrine which originated from Western Europe gained prominent between 1500 and the end of 1800. It is a philosophy which centred on trade and commerce for the overall development of any emerging state. The doctrine of mercantilism manifested in trading activities. These trading activities focus attention on export promotion simultaneously with import restrictions. To the mercantilist, trade is central to economic growth of any nation. It however argued in favour of export over import trade. Some classical economists have also argued in favour of trade as instrumental to economic growth. For instance Adams Smith proposed a theory of absolute advantage. The theory which proposed that a country which has an absolute advantage in the production of a commodity is able to produce such a commodity more efficiently. This implies that a country having an absolute advantage in the production of a commodity will produce more of the commodity given the same unit of input. When Adam Smith was confronted on what will happen if a country has absolute advantage in the production of the two commodities, his classical economist school mate, David Ricardo provided an answer to this worrisome question in his theory of comparative advantage.

Comparative advantage theory, a trade theory invented by David Ricardo in the early 19^{th} Century, and upheld in revised form within the neoclassical economics. The theory holds that a national economy will specialize through foreign trade in those lines of production in which she has a comparative advantage over the other, that is, in which she produces relatively most efficiently i.e. in absolute terms than its trading partner, she can still prosper through foreign trade. It is important to note here that, the theory depends largely on several strong assumptions namely; an absence of international capital mobility, and a supply-constraint economy, perfect competition and undistorted markets, countries tend to export goods in which they have comparative advantage and import goods in which they have comparative disadvantage.

The contribution of David Ricardo to foreign trade is what the modern economists referred to as comparative advantage theory. The theory asserts that even when a country can produce cheaper in all lines than her trading partner, exchange can still take place such that is based on differential cost advantage which a country enjoys over the other.

Table 1 gives an illustration of how this theory works.

Table 1. Illustration of comparative advantage theory as invented by David Ricardo

Commodity	Country I	Country II
A		
B		

David Ricardo believed that two countries can trade together if and only if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

From the information presented in Table 1, it is assumed that there are two countries in the world country I and country II and that there exist two commodities; A and B.

The two countries I and II producing commodities A and B with unit cost of (a_1, a_2) for commodity **A** and unit cost of (b_1, b_2) for commodity **B** by the two countries respectively. Suppose, $a_1 < a_2$, and $b_1 < b_2$ implies that country I can produce the two commodities cheaper, yet trade can still take place as long as $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

If $\frac{a_1}{a_2} < \frac{b_1}{b_2}$, country I can produce commodity A while country II can produce commodity B resulting to better welfare in the two countries and the world at large. Converse is the case If

$\frac{a_1}{a_2} > \frac{b_1}{b_2}$, that is, $\frac{b_1}{b_2} < \frac{a_1}{a_2}$

According to Heckscher-Ohlin factor endowment theorem, a country who is endowed with labour produces and exports labour intensive goods and import capital-intensive goods from capital endowed countries. The basis of this theorem is that countries of the world differ in their factor endowment. While some countries are rich in labour, others are rich in capital. So, trade can take place between labour-surplus nations and capital-rich countries. Each country and the world at large will experience greater output and improved welfare condition. International trade theorists suggest that trade enhances economic growth, bringing about gains in welfare. It is argued that trade can have a significant and positive impact on economic growth of a nation. Stiglitz and Andrew [3] noted that despite the view of international trade theorists in respect of significance and positive growth impact of trade, yet, disagreement arises when there are trade regimes with varying degrees of liberalization that countries adopt. Basically, the question of whether trade promotes or retards economic growth is contentious. While the orthodox school of thought hold an optimistic view about trade-growth nexus the heretical school of thought of the 20th century hold a pessimistic view about trade-growth nexus. Whatever comes out of this debate, it is necessary to note that the impact of foreign trade on economic growth will be determined largely by how valid the underlying assumptions are across countries. Foreign trade impact on growth is sensitive to those assumptions underlying the theory.

Empirically, the literature on trade-growth nexus is also characterized with mixed findings. While some studies confirmed positive and significant impact of foreign trade, others reported that it is difficult to find a clearly defined positive link or even that there is a negative or inverse relationship between foreign trade and economic growth. For instance, a study was conducted by Emeka, Ikpesu and Peter (2012) on the Macroeconomic impact of trade on economic growth in Nigeria for the period from 1970 to 2008 using a combination of bi-variate and multivariate models. The result showed that exports and Foreign Direct Investment inflows have positive and significant impact on economic growth in Nigeria. Similarly, Omoju and Adesanya [4] conducted their own study on the impact of trade on economic growth in Nigeria employing time series data covering the period of 1980 to 2010 using Ordinary Least Square method of estimation, the result showed that trade, exchange rate, government expenditure and foreign direct investment have a positive and significant impact on economic growth in Nigeria. Also, Edoumiekumo and Opukri [5] empirically investigated the contributions of international trade (proxy with export and import values) to economic growth in Nigeria using time-series data covering a period of 27years. The study employed time-series econometric procedures. The results showed that there is cointegration between trade and economic growth. The result also showed that there is positive relationship between trade and economic growth. The result of Granger Causality test showed that there is a uni-directional causality running from RGDP to

export and also from import to RGDP and export supporting the hypothesis of causation between trade and economic growth.

Muhammad, Mohammad and Abdul [6] examined the relationship between trade, financial development and economic growth in Australia over the period of 1965-2010 using The ARDL bounds testing procedure. The result confirmed the existence of long run equilibrium relationship among the variables. The results also showed that trade, among other stimulates economic growth both in the short-run and also in the long-run. The conclusion from the finding of this study is that trade has a positive impact on economic growth in Australia. Vohra [7] conducted a study on relationship between export and economic growth in India, Pakistan, the Phillipines, Malaysia, and Thailand covering data from 1973 to 1993. The result showed that when a country has achieved some level of economic development, exports have a positive and significant impact on economic growth.

Balaguer [8] investigated the empirical linkages between exports and economic growth. The result of the analysis showed that 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. From this finding, it can be inferred that trade impact on growth is sensitive to income level attained by the country engaged in such a trade. Pandhi [9] conducted a study on the impact of exports on economic growth in Democratic Republic of Congo, Guinea Bissau, Malawi and Nigeria between the period from 1981 to 2003 using ordinary least squares method. The result shows that exports has positive impact on economic growth. Abughalia and Abusalem [10] conducted an empirical analysis on the Libyan economy and its structural changes focusing on the impact of Libyan foreign trade between 1980 and 2010. The study employed both descriptive and inferential statistical procedures to analyze the data. The conclusion drawn from their finding is that trade is more beneficial than being detrimental to the growth of Libyan economy. Benik and Yoonus [11] conducted a study to find out the potency of trade as an engine of growth in the ECOWAS countries. The study covered the period of 1963 to 2005. It can be concluded from their result that trade has positive impact on economic growth.

Yelwa and Diyoke [12] conducted a study on the link between export and economic growth in selected ECOWAS countries testing the strength of export as better alternative to foreign direct investment to drive the economies of selected countries. Panel econometric methodology was applied on panel data spanning 1980 to 2011. The conclusion from the result is that export is germane in explaining economic growth in these countries. Obadan and Okojie [13] examined the relationship between trade and economic growth in Nigeria using ordinary least square regression technique to analyze time-series data covering 1980 to 2007. The result shows that trade has positive relationship on economic growth in Nigeria. Mongoe and Mongale [14] conducted a study on the relationship between foreign trade and economic growth in South Africa using co-integrated vector autoregressive approach. The result showed that inflation rate, export and exchange rates have a positive impact on GDP while import is found to have a negative impact on GDP. Arodoye and Iyoha [15] studied the nexus between international trade and economic growth in Nigeria using quarterly time-series data spanning the period 1981 to 2010. The results indicated that there is a stable, long- run relationship between international trade and economic growth. The study also revealed that trade policies in favour of export expansion should be encouraged because exports are the driving force of economic growth. Milton and Ajan [16] conducted a study on the Impact of Trade on Economic Growth in ECOWAS Countries using panel data covering the period from 1990 to 2013. The result showed that exports trade among other variables such as exchange rate and investment were significant determinants of economic growth. Exports are found to consistently have positive relationship with economic growth, thus confirming the hypothesis of trade having a significant positive impact on economic growth in ECOWAS countries.

Most of the prior studies focused on export and import trade as a proxy for foreign trade. Some studies used trade openness to proxy foreign trade. Other studies included trade openness as part of control variables while capturing foreign trade impact on economic growth. A good number of studies have also included foreign direct investment and exchange rate as control variables in their models of economic growth with foreign trade as key explanatory variable. In order to contribute to the on-going debate on trade-economic growth nexus, this study

included recession dummy variable to account for the impact of the recent recession on trade-growth nexus in Nigeria. This study also differ in the choice of control variables included across studies on trade-growth nexus. Government expenditure (aggregated) and consumer prices were used as control variables. Though, this study adopted ordinary least square (OLS) and fully modified ordinary least square (FMOLS) estimation methods, the inferences drawn were only based on the result of (FMOLS) since it provides optimal estimates of cointegrating regressions and modifies least squares to account for serial correlation effects and for the endogeneity in the regressors that results from the existence of a cointegrating relationship, see, [17]. This is an improvement over (OLS). The time frame used for this study is also unique to the study. With these exploits, the study advances the existing body of knowledge on trade-economic growth nexus in Nigeria.

3. DATA AND ECONOMETRIC METHODOLOGY

This study engaged in disaggregated analysis of foreign trade impact on economic growth using Nigeria historical data. It should be noted that trade theorists suggest that trade promotes economic growth and hence countries of the world are encouraged to open up their economies in order to boost economic growth. The era of close economy is gone. The economy can achieve little or nothing under the state of autarchy and hence there has been a paradigm shift in favour of trade to boost economic growth. Countries are taken Bolden steps to open up their economies to tap from the numerous advantages that are associated with trade. Count on this theoretical perspective, this study conducted a disaggregated analysis of foreign trade impact on economic growth in Nigeria.

The time series data used for this study, spanned the period 1981 to 2017 and were collected on variables such as gross domestic product, foreign trade decomposed into four, namely; oil export, oil import, non-oil export and non-oil import. Others include aggregated government expenditure, and consumer price index. The data were sourced from Central Bank of Nigeria Statistical Bulletin and Annual Reports various years, augmented with World Development Indicators (WDI); all in their latest editions. Foreign trade variables, gross domestic product and government expenditure were all measured in billions of naira. Consumer price index is an index of consumer prices. All the variables were transformed into their natural logarithm form to allow for linearity.

3.1 Empirical Models

The model in its functional form is expressed as

$$Y_t = f(T_t^r,\ X_t) \tag{1}$$

In this simple model,

$Y_t = Economic\ Growth\ during\ the\ period\ t$
$T_t^r =\ Foreign\ Trade\ Variable$ during the period t
$X_t = Vector\ of\ Control\ Variables$ during the period t

But

$$T_t^r = (O_{E_t}, O_{M_t}, NO_{E_t}, NO_{M_t}) \tag{2}$$

And

$$X_t = (X_t^G,\ X_t^p) \tag{3}$$

Substituting (2) and (3) into (1), we have

$$Y_t = f(O_{E_t}, O_{M_t}, NO_{E_t}, NO_{M_t},\ X_t^G,\ X_t^p) \tag{4}$$

Where

O_{E_t} = Oil Export during the period t
O_{M_t} = Oil Import during the period t
NO_{E_t} = Non-oil Export during the period t
NO_{M_t} = Non-oil Import during the period t
X_t^G = Aggregated government Expenditure during the period t
X_t^p = Consumer price index during the period t

Expressing (4) econometrically, we have

$$Y_t = f(O_{E_t}, O_{M_t}, NO_{E_t}, NO_{M_t},\ X_t^G,\ X_t^p,\ \varepsilon_t) \tag{5.1}$$

Incorporating the recession dummy variable into (5.1), we have

$$Y_t = f(O_{E_t}, O_{M_t}, NO_{E_t}, NO_{M_t},\ X_t^G,\ X_t^p,\ D_t^R,\ \varepsilon_t) \tag{5.2}$$

Where

D_t^R = {Recession dummy variable; =1, or 0 elsewhere}

Other variables as previously defined.

The two models presented for final estimation are represented by equation (5).

3.2 Bivariate Granger Causality Test

In order to find out if there is evidence of causality between each of the variables used to explain economic growth in this study, the study employed pairwise granger causality models proposed by Granger (1969, 1979) [18] to examine the direction of causality. Granger's (1979) causality test regresses a variable, Y, on lagged values of itself and another variable X. If X is significant, it means that it explains some of the variance in Y that is not explained by lagged values of Y itself. This indicates that X is causally prior to Y and is said to dynamically cause or Granger cause Y. Granger proposed the regression equation of the form

$$Y_t = \sum_{j=1}^{m} \alpha_t Y_{t-j} + \sum_{j=1}^{m} \beta_t X_{t-j} + U_t \quad (6)$$

Expressing equation (6) as a pair of regression equations

$$Y'_t = \sum_{i=1}^{n} \eta_i X'_{t-i} + \sum_{j=1}^{n} \phi_j Y'_{t-j} + U'_{1t} \quad (7.1)$$

$$X'_t = \sum_{j=1}^{n} \delta_i X'_{t-i} + \sum_{j=1}^{n} \Omega_j Y'_{t-j} + U'_{2t} \quad (7.2)$$

Where:

Y'_t and X'_t are vector of any given pair of variables in the time t, U'_{1t} and U'_{2t} are vector of stochastic error terms which are assumed to be uncorrelated, with zero mean and constant variance.

$X_t = \{O_{E_t}, O_{M_t}, NO_{E_t}, NO_{M_t}, X_t^G, X_t^p\}$. Note all variables in X_t as previously defined.

4. EMPIRICAL RESULTS

This section presents the result of empirical analysis. The variables included in the analysis were summarized, statistical properties of the data and cointegration analysis were carried out. Models were estimated to capture the impact of foreign trade (disaggregated) among other variables on economic growth and also to test the causality hypotheses between foreign trade variables among other and economic growth in Nigeria using historical data spanning from 1981 to 2017.

4.1 Descriptive Summary of the Study Variables

The result of descriptive analysis as presented in Table 2 revealed that non-oil export, oil import, and inflation are the most volatile variables during the period under investigation. This is because they have the greatest co-efficient of variation which is computed as standard deviation divided by the mean. These variables dispersed widely from their mean. Other variables are not too far from their mean. The skewness statistic reveals that all the variables are positively skewed. The kurtosis statistic for each variable is less than the threshold of 3, showing that foreign variables among other variables are said to be platykurtic implying that their distributions produced fewer outliers relative to normal distribution. Lastly, the p-value of Jarque-Bera statistic is greater than (0.05) for all the variables involved in the analysis. This implies that all variables are normally distributed.

From the table, oil export on the average constituted about 16.85 per cent of the GDP while the non-oil export constituted about 0.01 per cent. This implies that economic activities in the non-oil sector is extremely low. Oil import on the average constituted about 2.88 per cent of the GDP while the non-oil import constituted about 9.49 per cent.

4.2 Result of the Unit Root Test

Modelling relationship between two or more economic variables using time series data requires that such time series data on the variables involved in the analysis should be stationary. The performance of OLS is based on the stationarity assumption, once this assumption fails to hold, then, any regression involving two or more non-stationary variables is said to be spurious. For more exposition on this see Granger and Newbold [19]. In the light of this, in order to avoid spurious regression in time series modelling, unit root test becomes an important task to be done. It seems to be the first step that needed to be carried out. The outcome always determine the next line of action in any study involving time series data. Hence, this study conducted a unit root test using both Augmented Dickey Fuller (ADF) due to Dickey and Fuller (1979, 1981) and Phillip-Perron (PP) credited to Phillips and Perron (1988) unit root tests.

Both tests rely on the rejection of a null hypothesis of unit root in favour of the alternative hypothesis of no unit root. Failure of the test to reject the null hypothesis of unit root implies that the series concerned is non-stationary. On the other hand, the rejection of the null hypothesis of unit root implies that the series involved is stationary. The tests were conducted in most cases with drift and deterministic trend. The lag selection was automatically done using SIC criterion. The result of the unit root test is shown in Table 3. The result from the table shows that all variables involved in this study are non-stationary since the null hypothesis of unit root cannot be rejected at the level of the variables. However, the null hypothesis of unit root can be comfortably rejected on the first differences of the variable. This implies that all variables are said to be I(1) since their first differences are found to be stationary.

4.3 Result of Cointegration Tests

A test of cointegration is necessary having confirmed the order of integration of each of the variables involved in this analysis. Once there is cointegration, then the variables can be modelled together. This study employed a multivariate cointegration test proposed by Johansen and Juselius [20]. The literature has applauded the robustness and appropriateness of this cointegration approach especially when dealing with more than two variables. The fact that this method will not only reveal whether there is cointegration or not but being able to reveal the number of cointegrating vectors has made it much more appropriate for this study.

Table 4 presents the result of multivariate cointegration test conducted on foreign trade variables among other and economic growth in Nigeria. Both the trace test and maximal eigen value test reveal that there is cointegration among the group of I(1) variables. While the trace test revealed that there exists four cointegrating vectors, maximal eigen value test revealed that there exist three cointegrating vectors. The existence of cointegration is an indication of existence of long-run equilibrium relationship among the underlying variables. It also confirmed the existence of causality at least in one direction.

4.4 The Long-run FMOLS Results

Fully modified ordinary least squares (FMOLS) regression provides optimal estimates of cointegrating regressions, it modifies least squares to account for serial correlation effects and for the endogeneity in the regressors that results from the existence of a cointegrating relationship (Phillips and Hansen, 1990). Having confirmed cointegration among the variables to be modelled together, they can be presented by a long-run FMOLS estimate. The methods employs the semi-parametric correction to eliminate the long-run correlation between the cointegrating equation and the innovations. Based on these special features embedded in FMOLS, this study even though used both OLS and FMOLS as method of estimation but adopted the FMOLS result as the basis for drawing inferences in this study. It should be noted here that OLS may still be appropriate to achieve the objective of this study since the individually nonstationary series are found to be cointegrated, this allay the fear of spurious result as noted by Engle-Granger (1987). However, both result maintain the same sign for our estimated parameters but with marginal variations in the magnitude of the impact each of the explanatory variables has on economic growth.

Table 5 presents the results of the OLS and FMOLS estimate. Two models were estimated. The first model did not capture the likely impact of the recent recession experienced by the Nigerian economy. The second model controlled for the recession period by including recession dummy variable. From this result, it could be inferred that a 10 per cent increase in non-oil export trade raised economic growth by about 3.6 per cent, but this drops to 3.2 per cent when control for recession period. Also, a 10 per cent increase in non-oil import raised economic growth by about 1.02 percent, but this drops to 0.97 per cent when recession dummy variable is included in model 2. On the side of oil trade component, the result shows that a 10 per cent decrease in oil export raised economic growth by about 0.8 per cent without control for recession period but this drops to about 0.26 per cent when recession dummy variable is included in model 2. On the impact of oil import, the result shows that a 10 per cent decrease in oil import raised economic growth by about 3.3 per cent without control for recession period. The magnitude of this impact drops to about 3.1 per cent when recession dummy variable is included as in model 2. This result suggests that non-oil trade has positive impact on economic growth while oil trade have negative impact.

Table 2. Descriptive summary of the study variables

	LOG(NGDPBN)	LOG(OILEXP)	LOG(OILIMP)	LOG(NOILEXP)	LOG(NOILIMP)	LOG(TGEXP)	LOG(CPI)
Foreign trade as % GDP	-	16.85	2.88	0.01	9.49	-	-
Mean (absolute form)	24847.20	4187.032	714.443	242.243	2357.908	1708.498	50.345
Mean (log form)	8.447	6.560	4.315	3.282	6.027	5.966	2.739
Median	8.577	7.159	5.355	3.332	6.520	6.553	3.330
Maximum	11.641	9.570	8.028	7.030	9.143	9.024	5.214
Minimum	4.976	1.974	-2.303	-1.609	1.629	2.266	-0.713
Stdard Deviation.	2.305	2.663	3.285	2.783	2.529	2.241	1.985
Skewness	-0.163	-0.507	-0.739	-0.245	-0.409	-0.373	-0.470
Kurtosis	1.594	1.816	2.280	1.869	1.740	1.715	1.750
Jarque-Bera	3.213	3.749	4.167	2.342	3.480	3.404	3.771
Probability	0.201	0.153	0.125	0.310	0.176	0.182	0.152
Sum	312.541	242.725	159.664	121.426	222.988	220.757	101.353
Sum Square Deviation.	191.253	255.269	388.520	278.761	230.170	180.793	141.780
Coefficient of variation	27.287	40.592	76.129	84.792	27.034	37.560	72.447
Observations	37	37	37	37	37	37	37

Source: Author's Computation, 2018

Table 3. Results of unit root tests

Variables	ADF statistic at level	ADF statistic at first difference	Order of integration	PP statistic at Level	PP Statistic at first difference	Order of integration
LOG(NGDPBN)	-0.311187*	- 3.146756**	I (1)	-1.316401	-3.071119**	I (1)
LOG(NOILEXP))	- 2.551467	- 7.139291*	I (1)	-2.679192	-11.59569*	I (1)
LOG(NOILIMP))	- 0.952614	- 7.244671*	I (1)	-1.771789	-7.227357*	I (1)
LOG(OILEXP))	- 1.131902	- 5.282318*	I (1)	-1.131902	-7.217922*	I (1)
LOG(OILIMP))	-1.501903	- 7.129853*	I (1)	-1.136621	-9.074787*	I (1)
LOG(TGEXP))	- 0.514146	- 7.339260*	I (1)	-1.214926	-7.263649*	I (1)
LOG(CPI))	-0.389848	-3.711239**	I (1)	-0.574505	-4.051944**	I (1)

**and ** denotes rejection of the hypothesis of unit root at level at 1% and 5% significance level respectively*

Table 4. Result of multivariate co-integration test

		Trace test				Maximal eigen value test			
H_0	H_1	Eigen value	Trace statistic	5% Critical value	P-Value	Eigen Value	Maximal eigen statistic	5% Critical Value	P-Value
r = 0	*r = 1*	0.789061	194.5395	125.6154*	0.0000	0.789061	54.46653	46.23142*	0.0054
r ≤ 1	*r = 2*	0.758777	140.0729	95.75366*	0.0000	0.758777	49.77112	40.07757*	0.0030
r ≤ 2	*r = 3*	0.639222	90.30181	69.81889*	0.0005	0.639222	35.68228	33.87687*	0.0301
r ≤ 3	*r = 4*	0.525991	54.61953	47.85613*	0.0102	0.525991	26.12848	27.58434	0.0758
r ≤ 4	*r = 5*	0.377254	28.49105	29.79707	0.0701	0.377254	16.57658	21.13162	0.1929
r ≤ 5	*r = 6*	0.247790	11.91447	15.49471	0.1611	0.247790	9.965888	14.26460	0.2142
r ≤ 6	*r = 7*	0.054152	1.948582	3.841466	0.1627	0.054152	1.948582	3.841466	0.1627

** denotes rejection of the hypothesis of no co-integration among the group of individually non-stationary variables at 5 % level*

Table 5.1. Result of OLS estimate

	Dependent variable: LOG(GDP))							
Variable	**MODEL 1**				**MODEL 2**			
	Coefficient	**Standard error**	**t-statistic**	**P-value**	**Coefficient**	**Standard error**	**t-statistic**	**P-value**
LOG(NOILEXP))	0.306933	0.062374	4.920888*	0.0000	0.295085	0.127425	4.676547*	0.0001
LOG(NOILIMP))	0.105033	0.122034	0.860689	0.3962	0.082667	0.123328	0.670307	0.5080
LOG(OILEXP))	-0.095398	0.108014	-0.883198	0.3842	-0.020686	0.111672	-0.162341	0.8722
LOG(OILIMP))	-0.273898	0.060026	-4.563019*	0.0001	-0.265916	0.060267	-4.412279*	0.0001
LOG(TGEXP))	0.535703	0.161236	3.322487*	0.0024	0.510822	0.162294	3.147508*	0.0038
LOG(CPI))	0.567432	0.167801	3.381581*	0.0020	0.519111	0.172956	3.001407*	0.0055
RDUM	-	-	-	-	0.166568	0.151992	1.095897	0.2821
C	3.863946	0.464248	8.323028*	0.0000	3.780369	0.468943	8.061466*	0.0000
R-Squared	0.994562	**Mean dependent variable**		8.44704	0.994778	**Mean dependent variable**		8.44704
Adj. R-Squared	0.993474	**S.D. dependent variable**		2.30491	0.993517	**S.D. dependent variable**		2.30491
S.E. of Regression	0.186198	**Sum squared residual**		1.04010	0.185578	**Sum squared residual**		0.99873
F-stat (p-value)	914.4020(0.000)	**DW-stat =** 1.438168			789.1958(0.000)	**DW-stat =** 1.445937		

** denotes rejection of the null hypothesis at 1% level of significance*

Table 5.2. Result of FMOLS regression

	Dependent variable: LOG(GDP))							
Variable	**MODEL 1**				**MODEL 2**			
	Coefficient	**Standard error**	**t-Statistic**	**P-value**	**Coefficient**	**Standard error**	**t-Statistic**	**P-value**
LOG(NOILEXP))	0.364797	0.062856	5.803707*	0.0000	0.323749	0.111672	5.842072*	0.0000
LOG(NOILIMP))	0.102490	0.130618	0.784651	0.4390	0.097291	0.114559	0.849261	0.4029
LOG(OILEXP))	-0.084952	0.108585	-0.782348	0.4404	0.026248	0.111672	0.235044	0.8159
LOG(OILIMP))	-0.327055	0.063828	-5.123969*	0.0000	-0.314582	0.055699	-5.647860*	0.0000
LOG(TGEXP))	0.601427	0.162383	3.703752*	0.0009	0.545359	0.142306	3.832298*	0.0007
LOG(CPI))	0.500834	0.173937	2.879392*	0.0074	0.445497	0.156243	2.851308*	0.0081
RDUM	-	-	-	-	0.150294	0.133022	1.129845	0.2681
C	3.656981	0.490759	7.451688*	0.0000	3.510069	0.432125	8.122807*	K0.0000
R-Squared	0.993704	**Mean dependent variable**		8.543471	0.994239	**Mean dependent variable**		8.543471
Adj. R-Squared	0.992401	**S.D. dependent variable**		2.260640	0.992799	**S.D. dependent variable**		2.260640
S.E. of Regression	0.197066	**Sum squared residual**		1.126217	0.191839	**Sum squared residual**		1.030462
Long-run variance	0.034941				0.026336			

** denotes rejection of the null hypothesis at 1% level of significance*

From the finding of this study, it appears like a crowding-out effect exists between oil and non-oil sectors. The result also show that the negative impact of oil trade on economic growth was marginally declining during the recession. This could be due to various measures put in place by the government to rescue the economy out of recession. Both the export and import components of oil trade have a negative impact on economic growth. The magnitude of this impact is greater in oil import than in oil export. This might be unconnected with the magnitude of the corruption in the Nigerian oil and gas sector. It can still be recalled, the oil subsidy crisis and the public debate that lasted long in the memory of all Nigerians. Should oil subsidy continues or should it be abolished? Some school of thought were in favour of subsidy removal while some against it. Another school of thought are even in doubt if there is any subsidy at all. The finding of this study supports the general view of classifying Nigeria as a resource-curse nation. The recession experience mandated the government in the peak of recession to take some drastic policy measures in favour of non-oil sector. It is also noted from the result that both government expenditure and consumer prices have positive and significant impact on economic growth. The two variables shows a considerable significant positive impact on growth.

4.5 Result of Diagnostic Tests on Empirical Models

The result of the post-estimation/diagnostic test as presented in Table 6 showed that, the residuals of the models are normally distributed. The probability value of Jargue-bera statistic is greater than (0.05). This implies that the null hypothesis of normal distribution cannot be rejected at 5% critical value. The model minimized the long-run error variance. There is nothing to worry about the problem of serial correlation of the residuals. The result presented in the table confirm this. The probability value of the obtained Q-statistic is greater than 0.05, which indicate that the null hypothesis of no serial correlation cannot be rejected at 5% critical value.

4.6 Results of Pairwise Granger Causality Tests

This study having established a long-run relationship between foreign trade variable among other and economic growth, proceeded to find out the direction of causality between each of the cointegrated variable and economic growth. The literature has it that once there is evidence of long-run relationship between two or more economic variables, then, there is evidence of causality in one direction. This study is

Table 6. Result of diagnostic tests

TEST	MODEL 1		MODEL 2	
	Statistic	P-value	Statistic	P-value
Autocorrelation Breusch-Godfrey	F-stat (1.092)	0.396	Q-stat (0.6261)	0.429
Heteroscedasticity ARCH-LM	F-stat (1.819)	0.138	-	-
Normality Test	JB-stat (0.901)	0.637	JB-stat (1.019)	0.601

Table 7. Results of Pairwise granger causality tests

Null hypothesis about the direction of causality	No of observation	F-Statistic	P-value
Oil export to economic growth	35	0.78582	0.4649
Economic growth to oil export	35	3.39599	0.0468
Oil import to economic growth	35	2.62789	0.0888
Economic growth to oil import	35	1.40676	0.2606
Non-oil export to economic growth	35	1.23244	0.3059
Economic growth to non-oil export	35	2.15650	0.1333
Non-oil import to economic growth	35	0.31513	0.7321
Economic growth to non-oil import	35	2.95399	0.0674
Government expenditure to economic growth	35	4.76447	0.0160
Economic growth to government expenditure	35	3.49693	0.0431
Consumer prices to economic growth	35	0.98462	0.3853
Economic growth to consumer prices	35	2.20191	0.1281

Source: Author's computation, 2018

desirous of finding out the direction of causality between each of the cointegrated variables and economic growth. To achieve this, the study employed pairwise granger causality tests and the result is presented in Table 7.

The result from the table shows that there is no causality running from foreign trade variables to economic growth. However, there is causality running from economic growth to foreign trade variable particularly oil export. The result also shows that there is bi-directional causality between government expenditure and economic growth.

5. CONCLUSION

This study conducted a disaggregated analysis of foreign trade impact on economic growth in Nigeria using a fully modified ordinary least square estimation approach on historical data spanning from 1981 to 2017. A simple growth model was formulated with foreign trade as key explanatory variable. Other variables included in the model are government expenditure and consumer prices. Government expenditure was included in the model due to the inevitable role of public sector in economic management. This variable has been considered very vital in any growth process. This is in line with the endogenous growth model. Consumer price index was also included due to the role of market competitiveness in determining the rate of economic growth. How competitive are the product prices in an economy is germane in determining the growth rate of such economy.

The foreign trade in this study was decomposed into four components namely; oil export, non-oil export, oil import and non-oil import. After a thorough examination of the statistical properties of the data collected for the study, the specified models were estimated using fully modified ordinary least square method. The result shows that foreign trade among other variables have long-run equilibrium relationship with economic growth. The result also shows that non-oil trade among other variables has positive and significant impact while oil trade has negative and significant impact on long-run economic growth. This implies that non-oil trade is beneficial to growth while oil trade is detrimental to growth. The result strongly suggests that non-oil export significantly explained the rate of economic growth in Nigeria. The result further revealed that both government expenditure and consumer prices have positive and significant impact on economic growth.

The result of further analysis shows that though, there is no causality running from foreign trade variables to economic growth, but, there is causality running from economic growth to foreign trade variable particularly oil export. This provides some empirical evidence on the existence of causality between foreign trade and economic growth. Bi-directional causality was found to exist between government expenditure and economic growth. The implication of the finding of this study is that, there is need to sustain and invigorate the effort of government in the diversification of the Nigerian economy from oil to non-oil status. As this study revealed that the oil export is 16.89 percent of the gross domestic product, non-oil export is just about 0.01 per cent of the nation's gross domestic product during the period under consideration. This finding justifies the reason for the high rate of unemployment in Nigeria in the recent time. The economic activities in the non-oil sector is marginally very low and provocative. Nigerian economy should be repositioned to boost the non-oil trade and the activities in the non-oil sector such as agriculture, mining, manufacturing and other non-oil sub-sector of the Nigerian economy. It is no doubt, this non-oil sub-sector has a capacity to absorb the unused human and material resources and convert the wasteful human and material resources to a very useful and revenue generator for the Nigerian government at local, state and federal levels. Also, import should be allowed to grow proportionally to investment rate in the non-oil sector so as to boost the non-oil export trade and advance the course of economic development in Nigeria.

The study therefore concluded that the expected beneficial impact of foreign trade on economic growth depended largely on the magnitude of non-oil export component in total foreign trade Nigeria experienced during the period under investigation.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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