

Assessing the Impact of Non-Oil Trade on Nigerian Economic Growth

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Abstract Nigeria is well documented to be a major exporter of natural resources especially crude oil but its impact on economic growth have been underwhelming. What drives this research is that diversifying the economy is paramount to achieving sustainable economic growth, which Nigeria needs most. Thus, this paper assesses the impact of non-oil trade on Nigerian economic growth with an emphasis on export, import and aggregate trade. ARDL estimation technique was adopted for the analysis and result reveal that non-oil export is paramount to economic growth in the short-run while export, import and aggregate trade are revealed to have a significant positive influence in the long-run. This highlights the importance of non-oil sector trade (especially exports) on the economic growth of Nigeria. Policies are therefore encouraging to boost the non-oil sector export in Nigeria of which export promotion should be encouraged.

Keywords: Nigeria, Non-oil Trade, ARDL, Economic growth

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1. Introduction

The Neoclassical Growth model was developed by Robert Solow identified technology and labour as the main motivator of economic growth. In other words, an increase in labour supply and improved technology will necessitate economic growth of any given nation. The assumption of the neoclassical model, that technology is exogenously determined, and its level of availability is the same throughout the world has been criticised by [1], who argue that technology in the model is tradable in a perfectly competitive market where it is freely available and is endogenously determined for long-run economic growth. Based on this, [2] reasoned that since the uniformity of growth rate of technology is grossly insufficient, the dissemination of internationally available technology depends on the country-specific factors. They noted that international trade could be seen as principal networks through which ideas can be exchanged across borders. This research chiefly anchored on this growth theory where international trade is a relevant tool to disseminate technology and achieve economic growth.

International trade refers to the exchange of goods, services and capital through the international territories or borders. In some countries, international trade constitutes a substantial portion of the Gross Domestic Product (GDP). Hence, international trade attracts interest to policymakers and economists. It allows countries to sell their internally produced products to other countries of the

world [3]. Since growth is hardly experienced in any country without international trade, it plays a dynamic role in the reformation of the economic and social attributes of any nation, especially the third world countries. Moreover, in the last couple of decades, development economists have long acknowledged the role of international commerce in the growth process of national economies as trade provides both foreign exchange earnings and market stimulus, for accelerated economic growth.

Many researchers have evaluated the effect of foreign trade on economic growth; [4,5,6,7] and conclude there is a robust effect of international trade on economic growth. [4] and [6] focused on the Chinese economy and its engagement in foreign trade and concluded that bilateral trade has a significant impact on the growth of the Chinese economy. [5] reports similar result from Ivory Coast while [7], examines the impact of foreign trade on Romania's economic sustainability during the Pre- and post-accession periods which affirms the claims of earlier researches. One of the major objectives of international trade is to bring about the promotion of economic growth which has rarely been disputed by researchers. In Nigeria specifically, researchers have agreed to the importance of international trade on economic growth in the country. (see [8,9,10,11]).

In Nigeria, crude oil constitutes the largest part of the country's export trade and revenue while also importing a large portion of its refined product. With a large amount of trade, it has been perceived that the Nigerian economy has grossly performed below expectation relative to its immense natural endowment and her counterpart nations. Despite her numerous solid mineral resources and a

population of over 170 million people, one of the largest gas and crude oil reserves in the globe, the economic performance of the country was affirmed rather weak when compared and contrasted to the emerging Asian nations such as India, Thailand, Malaysia, China, and Indonesia. These countries were far lagged behind Nigeria in terms of GDP per capita in 1970, but later they were better able to transmogrify their economies to become stellar players on the global economic arena [12]. [13] affirmed that while China, in 1970, was ranked 114th with a GDP per capita of US\$111.82, Nigeria with a GDP per capita of US\$233.35 was ranked 88th in the world economies. Today, China takes a promising and enviable stance in the global scheme of issues largely due to her self-esteem trade status.

These economies are based on restructured export orientation which diversified the economy. In Nigeria, for instance, there is an increasing export of oil products but decreasing export of non-oil product of which its import is surging to an alarming rate. One beginning to wonder if these non-oil export in Nigeria has less significant to economic growth compared to the oil export. Thus, to ensure sustainable development, there is need to diversify the content of the country's export trade which calls for the review of the performance of non-oil trade on the economic growth of Nigeria, which has driven the essence of this research.

The remaining part of the research is divided into different sub-section; the literature review which follows immediately. Section three explains the data and methodology applied in the research which section four presents the results and brief discussion with section five detailing the conclusion.

2. Literature Review

They are diverse economics literature which investigated the influenced of trade and trade openness on economic growth. Most of which have focused on sub-Saharan Africa and a good number on Nigeria. [6], examine the effects of international trade on China's economic growth. Applying econometric and non-parametric techniques on six (6) year data of 21 provinces in China from 2002 to 2007, their finding reveals that increasing participation in international trade helps stimulate rapid national economic growth in China. Thus, international trade volume and China's trade structure on technological exports positively affects China's regional productions.

[10] investigates the macroeconomic impact of trade on Nigerian growth. Using the Ordinary Least Square (OLS) regression technique and applying a combination of bivariate and multivariate models from the data covering the period 1970 - 2008 observed that the two predictors used in the study for trade, namely exports and foreign direct investment have a positive and significant impact on Nigeria's growth during the period. [14] and [8], in their study, investigate the causality between openness variables and economic growth in Nigeria. Results indicate that there exists an un-directional relationship between openness and economic growth and also, economic growth and international trade.

[4], examines the impact of Chinese foreign direct investment and bilateral trade with Nigeria economic growth using data from 1990 to 2007. The study found that in the short term, the bilateral trade doesn't contribute to Nigerian economic growth but the long-run relationship has the potential of enhancing Nigeria economic growth.

[15], examine the impact of international trade on the economic growth from 1985-2015. Adopting Imports, exports, the balance of trade, trade openness, real gross domestic product, the result showed that there is a long-run relationship between international trade and economic growth, import and trade openness are both insignificant in the short run but significant in the long run while export and balance of trade are significant in both the short and long run. The Granger causality test showed that economic growth is independent of imports, exports and balance of trade but economic growth is unidirectional with trade openness.

[16], examine the effect of foreign trade and foreign exchange rate on economic growth in Nigeria from 1970 to 2015. In their analysis, GDP, exchange rate, import, export, trade openness and inflation rate were all found to have a statistically significant impact on economic growth in Nigeria. They conclude that foreign trade (proxied by import and export) have a positive and significant impact on economic growth, while the exchange rate has a significant positive impact on export but has a significant negative effect on import.

[5], examines the impact of trade openness on economic growth in Cote d'Ivoire over the period 1965-2014 in a multivariate framework including capital stock, labour and trade openness as repressors. The results show that trade openness has positive effects on economic growth both in the short and long run. Results also found a positive relationship between trade openness and capital formation in promoting economic growth. Similarly, [17], examined the effect of international trade on the economic growth of Nigeria from 1990 to 2016. The result of the empirical analysis revealed the absence of a unit root after second differencing and a stable long-run relationship between the variables. The result of the parsimonious error correction model showed that Export and Foreign Direct Investment had a positive and insignificant impact on economic growth, while import had a negative and also insignificant impact on growth.

[18], examine the causal relationship among development aid, openness to trade and economic growth in the least developed countries from 1970 to 2010. The study adopts real per capita GDP, openness to trade ratio and total net Official Development Assistance as a share of national income and found that there is no significant relationship among foreign aid, openness to trade and economic growth in a panel of African LDCs. [19], examines the impact of trade on economic growth in Nigeria from 1980 to 2010. The result shows that trade, foreign direct investment, government expenditure and exchange rate have a significant positive impact on economic growth in Nigeria. [20], empirically examine the impact of international trade on economic growth in Nigeria from 1970-2010. Empirical investigations reveal that the variables export, foreign direct investment and exchange rate have a positive statistically significant relationship

with real GDP while other variables such as import, inflation rate, openness exert a negative influence on real GDP.

[7], examines the impact of foreign trade on Romania's economic sustainability during the Pre- and post-accession periods. Result found that international financial crisis impact negatively on Romania's trade balance. Also, companies with FDI had an unfavourable effect on the trade balance from 2008 to 2012, while the manufacturing industry contributes to reducing the negative trade balance from 2009 to 2012. In a study carried out by [21], on the potential for internal trade and regional integration in Africa. Their study revealed the existence of the significant potential for intra-Africa trade.

[22], employed OLS to determine the impact of oil and non-oil export on economic growth from 1986-2011. Results show that foreign reserve, oil export and Non-oil export has a positive and significant impact on GDP. The result of the Granger causality test shows that GDP Granger causes export openness and FRESH, and export openness granger causes NOEXP, while NOEXP also granger causes FRESH. But [23], and [24] examine the effect of international trade on economic growth in Nigeria: the 21st-century experience using annual time series data. Using the OLS method, the study found that international trade has a significant positive impact on economic growth. [25], in their study used the ADF, PP and Granger causality tests to investigate the order of integration and relationship among international trade, financial development and economic growth in Pakistan. Result found that all variables are non-stationary and are co-integrated with a long-run relationship among international trade, financial development and economic growth. Thus, the study concludes that international trade and financial development spur economic growth in Pakistan.

[26], examine the differential effects of trade on economic growth and investment based on cross-country data. Empirical results based on different categories of countries show that although trade has a positive impact on economic growth in developed and developing countries, its effect is insignificant for least developed countries, which predominantly include African countries. Result also found that trade is a key determinant of foreign direct investment across all country group. In a study conducted by [27], to examine the nexus between foreign trade and economic growth in Nigeria using quarterly time-series data for 1981Q1 through 2010Q4. The results show that there is a stable, long-run relationship between foreign trade and economic growth. [28] in their study on the impact of international trade on economic growth in Nigeria for the period 1981 to 2012, found that trade openness and foreign exchange are statistically significant while the interest rate is statistically insignificant. [29], empirically investigate the dynamics of the relationship between imports (factor inputs and finished) and economic growth in Nigeria for the period 1970 to 2011. They use the Error Correction Model (ECM) and found that importation of manufactured goods has a negative impact on economic growth while the importation of factor inputs leads to economic growth in Nigeria.

[30], employs the empirical analysis with ADF unit root test, Johansen Co-integration test and the OLS to examine

the effects of international trade variables (openness of the economy, volume of import, export, foreign direct investment and exchange rate) on economic growth in Nigeria from 1985 to 2013. The result found the existence of two co-integrating equations signifying the existence of a long-run relationship among the variables. Regression result shows that export, foreign direct investment and openness of the economy has a direct and significant impact on economic growth in Nigeria, the exchange rate has a direct but insignificant impact on the nation's economy while the volume of import has an inverse and insignificant impact on the Nigerian economy. They, however, conclude that foreign trade variables of export, foreign direct investment and openness of the economy have the tendency to improve and sustained the national economic performance and stabilized the country trade with other nations of the world.

[12] investigated the impact of trade on Nigeria's economic growth. The results showed that exports, exchange rate and per capita income are positively related while economic openness and imports are negatively related to output in Nigeria. [31], in their empirical study of growth through trade, the Nigeria evidence using OLS with data from 1975 to 2012. The result indicates that total trade, FDI flow, exchange rate and degree of openness are statistically significant to economic growth. Total trade, FDI flow and exchange rate are contributing positively to growth, while the degree of openness contributes negatively to economic growth in Nigeria. [32], used OLS, to examine the impact of international trade on economic growth in Nigeria from 1981 to 2014. All variables were found to be stationary at the first difference, and Result indicates that government expenditures, interest rate, import and export are all positive while exchange rate and foreign direct investment are negative. Also, variables except for FDI and government expenditure were found to impact statistically insignificant.

3. Data and Methodology

3.1. Model and Data

In assessing the impact of trade openness on economic growth in Ivory Coast, [5] simplified the growth model and is hereby adopted. This paper also adopts the exchange rate as another exogenous factor that could affect economic growth. Thus, the growth model is modified as follows;

$$\Delta GR_{it} = \beta_0 + \beta_1 CAP_{it} + \beta_2 LAB_{it} + \beta_3 TO_{it} + \beta_4 EXEC_{it} + \mu_{it} \quad (1)$$

ΔGR_{it} stand for the real GDP per capita growth for the country, i at time t . This is the dependent variable and is preferred because it reflects the direct impact of the economy on society. CAP_{it} represents capital stock for the country, i at time t , which is a proxy for accumulated capital investment. LAB_{it} stand for the labour force as the percentage of the population for country i at time t . Labour and capital are essential contemporary growth factors and are hereby included. TO_{it} represents trade openness for country i at time t . Trade openness is taken

as $\frac{export + import}{real\ GDP}$ for total trade and TOE_{it} for export

trade openness which will take the form of $\frac{export}{real\ GDP}$

while TOI_{it} for import trade openness which will take the form of $\frac{import}{real\ GDP}$ and $EXEC_{it}$ Stands for the real

exchange rate. The exchange is a direct exchange which expresses the local currency in terms of the US dollar. Both trade openness and exchange rate are taken as exogenous variables that influence economic growth. Taking the logarithm of both sides will allow us to interpret the results as elasticity. Thus;

$$\ln \Delta GR_{it} = \theta_0 + \theta_1 \ln CAP_{it} + \theta_2 \ln LAB_{it} + \theta_3 \ln TO_{it} + \theta_4 \ln EXEC_{it} + \mu_{it}. \tag{2}$$

Equation 2 will be estimated with the appropriate estimation technique which aid to realise the objective of this research. The choice of variables has been justified in [5] and is adopted. While the attention of this research is on trade openness, the inclusion of the defunct growth determinants in labour and capital is essential and hereby included. Exchange rate serves as control an exogenous influence on economic growth.

Table 1. Data, Sources and Expectation

Variables	Expectation	Sources
GDP per capita growth	Dependent	UNCTAD
Non-oil trade	Positive	CBN
Non-oil export	Positive	CBN
Non-oil import	Positive	CBN
Labour force	Positive	WORLD BANK
Gross capital formation	Positive	WORLD BANK
Real effective exchange rate	Positive	WORLD BANK

Source: author's compilation.
Note: CBN-Central Bank of Nigeria

3.2. Estimation Method

There are many econometric methods for data analysis in economics research. However, this research adopted the Autoregressive Distribution Lag (ARDL) due to its robustness and consistency in time series analysis. The merits of using an Auto-regressive Distributed Lag (ARDL) technique for co-integration has been illustrated in [33], [34], and [35]. It is a dynamic technique which can also take the lag of independent variables as well as the lag of the dependent variable. Many have rooted for this technique relatively due to its numerous advantages relating to robustness in ascertaining the long run and short-run co-efficient of estimated parameters.

Researchers have queried the effectiveness of conventional co-integration methods when data are not integrated on the same level, just as many other have discarded the use of Ordinary Least Square (OLS) for econometric analyses on the ground of biasness in certain cases of analyses,

especially where there are zero items in terms of dependent variables as well as where there is a low frequency of data. With the choice of appropriate lags, ARDL estimation technique can eradicate the issue of multicollinearity which is usually visible when variable are correlated. Justifying the choice of ARDL estimation technique is usually dependent on the outcome of the stationarity tests.

Unlike Johansen's traditional methods of co-integration, one of ARDL's advantages is that stationarity checking is not mandatory while it might be appropriate to assess the data's behaviour. The ARDL technique can provide a simple diagnostic of the complex relationship between the variables-both dependent and independent irrespective of whether these variables are in I(1) or I(0). It was disclosed in [33] and [36] that the F-test can be used to check the degree of cointegration. This by checking the lagged-levels of all variables in the ARDL model for the specific significance. The simple conditional prerequisite is that the measured F-stat must be above the critical value of the lower and upper limits for co-integration to be defined. Again, offering an alternative way to explain the presence of co-integration in the model, [34] demonstrate that a negative and statistically significant error-correction (ECM-1) may be another metric to describe the long-run relationship between variables. This alternative methods to evaluate the cointegration is one reason many researchers called it robust. Yet again, several coefficients can be identified for lagged variables.

Equation (2) could be altered to the broad form of the Auto-regressive Distributed Lag Model (ARDL) as follows:

$$\begin{aligned} \Delta \ln GR_t &= \beta_0 + \beta_1 \ln GR_{t-i} + \beta_2 \ln CAP_{t-i} \\ &+ \beta_3 \ln LAB_{t-i} + \beta_4 \ln TO_{t-i} + \beta_5 \ln EXEC_{t-i} \\ &+ \sum_{i=0}^p \beta_7 \Delta \ln GR_{t-i} + \sum_{i=0}^p \beta_7 \Delta \ln CAP_{t-i} \\ &+ \sum_{i=0}^p \beta_7 \Delta \ln LAB_{t-i} + \sum_{i=0}^p \beta_7 \Delta \ln TO_{t-i} \\ &+ \sum_{i=0}^p \beta_7 \Delta \ln EXEC_{t-i} + ECM_t + \mu_t. \end{aligned} \tag{3}$$

Note that all the variables remain as previously described, but Δ stands for the difference (or change) in respective variables and (t-i) is the lag sign, where i is the number of lags. To satisfy the long-run relationship, ARDL bound test requires a null hypothesis for no co-integration HO: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$; for equation (3).

There are numerous models for research of this nature, however, models should be selected based on the track record of their use in terms of reliability, effectiveness and finally, adequacy of the model for the peculiar research. The autoregressive distributed lag error correction model was selected to its relative robustness, efficiency and the advantage of being able to aid in forming inferential information on the dynamic nature of the variable.

Table 2. Summary Statistics and Correlation

Panel A Summary Statistics							
Statistics	$\ln GR_t$	$\ln TO_t$	$\ln ITO_t$	$\ln ETO_t$	$\ln CAP_t$	$\ln LAB_t$	$\ln EXEC_t$
Mean	0.858055	0.116946	0.109069	0.007877	3.450911	4.08601	4.792519
Median	1.553723	0.117347	0.108418	0.007601	3.563678	4.095086	4.61026
Maximum	12.45747	0.254589	0.245141	0.017687	4.492965	4.130339	6.294274
Minimum	-13.1532	0.028558	0.025754	0.001355	2.651037	3.985794	3.915382
Std. Dev.	4.747021	0.046389	0.044775	0.004353	0.538451	0.042676	0.62025
Skewness	-0.45866	0.476793	0.599015	0.512478	0.024985	-1.4758	0.998461
Kurtosis	4.210493	3.654145	3.813615	2.536633	1.991724	3.828974	2.943959
Jarque-Bera	3.652352	2.117284	3.320641	2.003305	1.613602	14.8819	6.318829
Probability	0.161028	0.346927	0.190078	0.367272	0.446284	0.000587	0.042451
Sum	32.60611	4.443961	4.144621	0.29934	131.1346	155.2684	182.1157
Sum Sq. Dev.	833.7657	0.079623	0.074179	0.000701	10.7274	0.067385	14.23426
Observations	38	38	38	38	38	38	38
Panel B Correlation Coefficients							
Variables	$\ln GR_t$	$\ln TO_t$	$\ln ITO_t$	$\ln ETO_t$	$\ln CAP_t$	$\ln LAB_t$	$\ln EXEC_t$
$\ln GR_t$	1						
$\ln TO_t$	0.253612	1					
$\ln ITO_t$	0.217245	0.996065	1				
$\ln ETO_t$	0.468079	0.711241	0.728841	1			
$\ln CAP_t$	-0.44721	-0.27758	-0.2164	-0.43223	1		
$\ln LAB_t$	-0.08563	-0.03429	0.008568	-0.45356	0.386444	1	
$\ln EXEC_t$	-0.4683	-0.33715	-0.3147	-0.35589	0.396516	0.20339	1

Source: Author's Computation using E-view 10 version.

4. Result and Discussion

4.1. Summary Statistics and Correlation

The coefficient of correlation is reported in Table 2. The report shows that no two or more variables are correlated with each other except for trade openness, export openness and import openness which is why they will be estimated independently. This is to avoid the issue of multicollinearity that is envisaged when estimating independent variables that are correlated in one regression. Therefore, the choice to estimate trade openness different from the rest; import and export openness will reduce the chances of such multicollinearity. Thus, the estimation will be done thrice and the result will be posted side-by-side. This is in line with the objective and intent of this research and such will provide bases for which the hypotheses will be rectified.

4.2. Stationarity Test and Lag Selection Criteria

The unit root results presented in Table 3 is the augmented dickey fuller (ADF) test. The ADF test was

chosen because it is widely used and its output is said to be robust. The results show that the variables are stationary at either level or first difference and none is stationary at the second difference variable. All the variables are stationary at various level of significance which signifies the test statistic for each of the variables as presented in Table 3 are greater than the critical value. Although the variables are stationary at either level or first difference it does not matter due to the method of analysis conducted for the study which is ARDL.

With the ARDL model, the lag selection is very essential and according to [37] and [36], the lag selection is very sensitive such that the result of the F-statistic could be affected. Therefore, this research will be following [35] and [38] in implementing a lag selection criterion. This research therefore employed VAR Lag selection criteria, through which lag 4 is selected given that the asterisk falls mostly on lag 4 with all criteria except for SC which suggested that lag one be used. LR test statistics also suggested that lag four should be used. With the lag order selection criteria, the game of numbers always reigns supreme which means that lag four is employed in all future estimation. This result is posted in Table 4.

Table 3. Augmented Dickey-Fuller (ADF) Unit Root Test

Variables	Level		1st difference		Order of integration
	t-statistics	p-value	t-statistics	p-value	
$\ln GR_t$	-3.427835	0.0162	-7.942309	0.0000	1(0)
$\ln TO_t$	-3.268005	0.0238	-10.21681	0.0000	1(0)
$\ln ITO_t$	-3.268946	0.0238	-10.36772	0.0000	1(0)
$\ln ETO_t$	-3.635546	0.0228	-11.56352	0.0000	1(0)
$\ln CAP_t$	-1.838419	0.3568	-5.415195	0.0001	1(1)
$\ln LAB_t$	-0.342928	0.1240	-3.395888	0.0177	1(1)
$\ln EXEC_t$	-2.170570	0.2199	-4.592019	0.0007	1(1)

Sources: Author's Computation using Eview 10 version.

Table 4. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1.820677	NA	8.30E-07	0.187019	0.411484	0.263568
1	113.391	183.763	5.19E-09	-4.90536	-3.558567*	-4.44606
2	132.6057	25.99634	8.08E-09	-4.56504	-2.09593	-3.72301
3	153.6437	22.27545	1.35E-08	-4.33198	-0.74054	-3.1072
4	222.7992	2.88367*	1.90E-09*	-6.929366*	-2.21561	-5.321839*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion.

4.3. Bound Test for Cointegration

Before delving into analysing the long run and the short-run relationship between the variables, it is pertinent that one establishes whether there is a long-run relationship in the first place. Given the method of analysis employed in this research, it follows a bound test for cointegration using the ARDL technique. The result of which is revealed in Table 5. Following the assumptions and criteria of [34] for establishing long-run in ARDL, all the model fully satisfies them with reported negative ECM_{-1} of -0.27989 for overall trade model and significant at one per cent. The import and export models reported ECM_{-1} of -0.29653 and -0.59893 respectively and all statistically significant at one per cent.

The results for the three estimated models as posted in Table 5 also fulfilled the criteria established by [33], which suggested that the F statistics fall outside the lower and upper bounds respectively for any of the respective significant levels. In the outcome herein, the F-statistics for the three models falls above the upper bound at 1% level of significance. These, therefore, established the existence of a long-run relationship between the dependent variable and independent variables in all the three models.

In it, all one will say that the speed of adjustment toward long-run equilibrium is 27.99 per cent for the overall trade model while import-and export-models are 29.65 per cent and 59.89 per cent respectively. In other words, convergence to a long-run requires an average speed of 27.99 per cent to meet up with a significant long-run relationship in the trade model. Also, the convergence rate for import model is 29.65 per cent and that of the export model is 59.89 per cent. The speed of adjustment to long-run equilibrium is higher in the export model which shows that importance of export to economic development in Nigeria.

Table 5. Bound Test

	ECM	F-statistic	Critical Values		
			0I	1I	5I
Trade	-0.27989***	5.853983	10%	1.9	3.01
Import	-0.29653***	5.813408	5%	2.26	3.48
Export	-0.59893***	6.17334	1%	3.07	4.44

Source: Author's Computation.

4.4. The Short-run Analysis

The short-run result is represented by the error correction representation for ARDL which is reported in

Table 6. The estimation was done with option one of ARDL techniques for time series; no constant and no trend. Being one of the major variables in this research, we look at the impact of trade openness with economic growth. Trade, as used here, represents that of non-oil trade which is examined in three (3) perspectives; total non-oil trade, import in the non-oil sector and export in the non-oil sector. From the total non-oil trade model, openness seems to have a positive coefficient but not statistically significant which is similar to what is obtainable from the import model. It reflects that openness does not exert enough impact on economic growth in that aspect. The outcome is consistent at level, lags one and two. However, from the export model, the outcome seems robust with a consistent positive coefficient which is statistically significant. At level, the coefficient is 15.44 and statistically significant at one per cent. This implies that when non-oil export openness increases by one per cent, the growth will increase by 15.44 per cent all thing being equal. The result is consistent in lag one and lags two with even much higher impact. This implies that an increase in non-oil export does much to increase economic growth than import and of course total trade in the non-oil sector. When the country export more, it generates more revenue from the rest of the world which augments the economy of the nation. In all ramification, given the context of this research, non-oil export trade openness exerts a positive impact on the economic growth of Nigeria in the short-run. However, the magnitude of the impact increases with lags up to lag two.

Table 6. ARDL Error Correction Regression

Variable	Coefficient		
	Trade	Import	Export
$\Delta \ln GR_{t-1}$	0.41684***	0.40623***	0.2637*
$\Delta \ln TO_t$	19.7483	20.81089	1.544***
$\Delta \ln TO_{t-1}$	4.059435	4.92258	7.022***
$\Delta \ln TO_{t-2}$	-7.6027	-7.43782	7.97***
$\Delta \ln CAP_t$	7.92165*	7.81232*	14.996***
$\Delta \ln CAP_{t-1}$	4.622514	4.587733	-
$\Delta \ln CAP_{t-2}$	6.09311*	6.13166**	-
$\Delta \ln LAB_t$	11.6682**	10.1908**	40.8773**
$\Delta \ln LAB_{t-1}$	-113.892	-108.29	-117.83
$\Delta \ln LAB_{t-2}$	85.82057	80.80319	-
$\Delta \ln LAB_{t-3}$	104.9711*	110.6792*	-
$\Delta \ln EXC_t$	7.33998***	7.202532***	1.74401***
$\Delta \ln EXC_{t-1}$	-6.4628***	-6.44411***	-1.7304
$\Delta \ln EXC_{t-2}$	-1.34392	-1.30904	0.54349
$\Delta \ln EXC_{t-3}$	-7.77388***	-7.77556***	-6.2397***
EC_{m-1}	-0.27989***	-0.29653***	-0.59893***

No Constant and No Trend.

Based on Table 6 which shows the regression result of the annual percentage per capita growth rate as a proxy for economic growth in Nigeria, the coefficient of labour force participation rate is positive and statistically significant. In total trade model, the result is positive just as in import and export trade respectively. This implies that an increase in Labour rate in the country will increase economic growth and a decrease will as well decrease economic growth in Nigeria. The result is robust at level but not consistent in lags for all the three models. With a magnitude of 11.6682 in trade model, as shown in column 2 of Table 6, a unit increase in labour rate will increase economic growth by 11.6682 per cent, all things being equal. Similarly, from the result in column 3, an increase in labour rate will tend to increase economic growth in Nigeria as it reported coefficient of 10.1908. The same is applicable in result from column 4 which reported a coefficient of 40.8773 to show consistency with the performance of the variable. All the outcomes are statistically significant at 5 per cent.

According to the economic growth regression results shown in Table 6, gross capital formation as a proxy for the capital stock has a positive influence on economic growth for the period of the study. The estimated parameter in the model represent in column 2, indicates a coefficient of 7.92165 highlighting the magnitude of the impact on economic growth in Nigeria. This shows that a unit increase in capital stock will cause economic growth to increase by approximately 7.921 units and a unit decrease in capital stock will reduce economic growth in Nigeria by the same margin. Looking at the model represented in column 3, there was also positive influence with the coefficient of 7.81232 which by implication demonstrates that an increase in capital stock by one per cent will increase economic growth by approximately 7.8 per cent, all thing being equal. Also, in the model represented in column 4, a coefficient of 14.996 was reported to further buttress consistency of the variable. This implies that the amount of capital stock in Nigeria can be used in influencing economic growth in the country by at least 90% confidence level in the short-run.

Again, the real exchange rate in Nigeria has a positive impact on economic growth, especially at a level. This result emanating from various model estimated herein (from different models), show as a consistent result at level but not consistent with lag results. It should be noted that when exchange fluctuates a lot, the people do not want to apply hedges to secure their future but will rather take and transact business with any current rate. This is the situation in Nigeria and which is why the lags are not consistent with the outcome in level.

Lastly, the short-run result for the one-year lag period for economic growth seems to have a positive impact which statistically significant. In the model reported in column 2, the coefficient is 0.41684 and that reported in column 3 also has a positive coefficient of 0.40623 while that in column 4 is 0.2637 in the coefficient. The results are all statistically significant at one per cent except for export model which significant at ten per cent.

4.5. The Long-run Analysis

Looking at the long-run relationship, it has been established there is a long relationship between the

dependent variable and independent variables in the trade model, and that speed of convergence or adjustment from the short-run to the long run takes 27.99 per cent which is statistically significant at one per cent. Same is applicable in import and export models of which speed of adjustment from short-run to long-run equilibrium takes 29.65 per cent and that of 59.89 per cent in that order. The long-run result is reported in Table 7 revealed that in a trade model, the overall non-oil trade openness influences economic growth positively and statically significant at one per cent. The coefficient of 12.82 implies that the degree of openness influence economic growth by 12.82 per cent, all things being equal. In order worlds, as openness increases by one per cent, economic growth increases by 12.82 per cent approximately. Therefore, as trade increases with respect to GDP, tend to increase the welfare of the populace in Nigeria as the GDP per capita growth increases too.

Table 7. Long Run Estimation

Variable	Trade	Import	Export
$\ln TO_t$	12.8228*** (16.471)	11.2585** (14.6352)	9.419** (50.827)
$\ln CAP_t$	-5.63679* (5.523171)	-6.32525* (5.477201)	-7.46729** (3.582955)
$\ln LAB_t$	-27.6049 (29.71959)	-24.5943 (25.42278)	4.344436** (6.010999)
$\ln EXC_t$	25.57614 (24.46744)	23.80521 (21.54094)	3.258442** (4.243875)

Note: No Constant and No Trend.

In another dimension, with the import model, the long-run effect of openness seems to be positive and statistically significant. A positive coefficient of 11.26 reflects that as import increases by one per cent with respect to the GDP, the per capita increases by 11.26 per cent all things being equal. This further reflects that import contributes to an increase in the welfare of the citizen in Nigeria. In a similar dimension, export also contributes to the welfare of the populace since it also reports a positive coefficient of 9.42 approximately. This implies that as export increases, economic growth of Nigeria but its contribution to economic growth is lower than the contribution of import to the country. It should be noted that while Nigeria most often has a positive trade balance, its export is not diversifying, as the country is solely dependent on the export of crude oil which contributes to over 80 per cent of its total export. Import is somewhat diversified, as such could have much impact on the societal life of the Nigerian citizens just as it has reflected in the outcome of this estimation herein.

In the long, it is noted that fixed capital formation is consistently negative which implies its negative contribution to the economic growth of Nigeria. Results for all the models are statistically significant at 10 per cent except for export model which has a 5 per cent significance level. First, in overall trade model, there is a reported negative coefficient of -5.63679 which is similar to the outcome from the import-and export-models with reported negative coefficients of -6.32525 and -7.46729 respectively. The increasing incidence of Money laundering in Nigeria negates against an increase in investment which leads to low capital formation in the

country, thus negating the economic growth and welfare of the Nigerian people. This incidence has to be curtailed to ensure adequate capital formation in Nigeria for the general good of the populace.

Results emanating from the analysis indicates that the labour force is only positive and statistically significant determinant of economic growth in the export model. The reason is not farfetched, the relevance of labour force in economic growth is absorbed by import and total trade in the respective models. Increasing labour force would weaken more import since there is a chance that the country will utilise its labour to produce what would have been imported. Having said that, in the export direction, more output is generated and the excess of which is being exported which is why the positive coefficient in the long run.

In the long-run, real effective exchange has a positive influence on an export which is statistically significant at five per cent. However, results for another model yield positive coefficient but not statistically significant. This implies that as the real effective exchange rate increases, there the potential of increasing export. This is because the devaluation of the exchange rate will make Nigerian goods less expensive, especially as the regards non-export products. Thus will generate more revenue for the country and then increase economic growth.

4.6. Stability and Diagnostic Tests

The need for stability test could not be overemphasized. It of necessity to test for the stability of the model employed to ensure dependency and reliability of the results. These tests are conducted to determine the suitability and stability of the model applied in this

research work. The author resolved for Cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUM of Square) tests. The test statistic based on the CUSUM of recursive residuals was introduced in [39] and adopted herein. In a simulation study, [40] show that the CUSUM Test based on recursive residuals has better power to detect parameter instability occurring early in the sample than the test based on OLS residuals. Both CUSUM and CUSUM of Square test could be graphically represented to show such needed stability of models. In the model herein, there is an indication of perfect stability with no specification errors since the plotted lines are within the region of stability. Adrift from this region of stability will mean an error in the model specification but the result has stated otherwise, hence this report could be relied upon for further reference.

This research work also did some diagnostic tests to ascertain the extent of dependability of the model applied. It has absorbed the use of Jarque-Bera test for Normality test, Breusch-Godfrey test for serial correlation Lagrange Multiplier statistics. Two different Heteroscedasticity tests were also conducted, first with Breusch-Pagan-Godfrey and another with Harvey Heteroscedasticity test. All these tests further indicated that the model is normal with no sign of serial correlation and heteroscedasticity. The R-square and Adjusted R-Square is high enough which means the independent variables have a high degree of influence over the dependent variable. The null hypotheses for normality test, serial correlation test and heteroscedasticity test could not be rejected since their probabilities are very high. Generally, this implies that the short-run co-efficient in the ECM model is stable and therefore dependable.

Table 8. Diagnostic Test

	Trade	Import	Export
R-Square	0.957987	0.957987	0.957987
Adjusted R-square	0.920917	0.920917	0.920917
Normality Test	1.400720 (0.496407)	1.442225 (0.486211)	0.066085 (0.967497)
Serial Correlation	1.890613 (0.1969)	1.882592 (0.1981)	0.631347 (0.5454)
Heteroscedasticity Test	1.558014 (0.2158)	1.671916 (0.1801)	1.535217 (0.1985)
Heteroscedasticity Test II	0.639760 (0.8213)	0.602961 (0.8503)	0.690300 (0.7720)

Note: Numbers in parentheses are probabilities, Jarque Bera Normality Test was utilised, Serial correlation is with Breusch-Godfrey serial correlation Lagrange Statistics, Heteroscedasticity test is with Breusch-Pagan-Godfrey test and Heteroscedasticity test II is with Harvey test. All were done using E-views 10 version

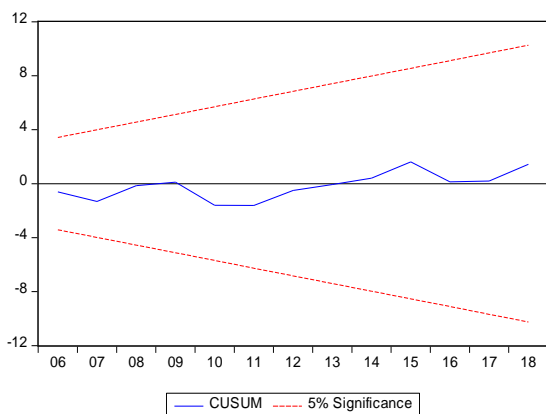


Figure 1. CUSUM for non-oil Trade

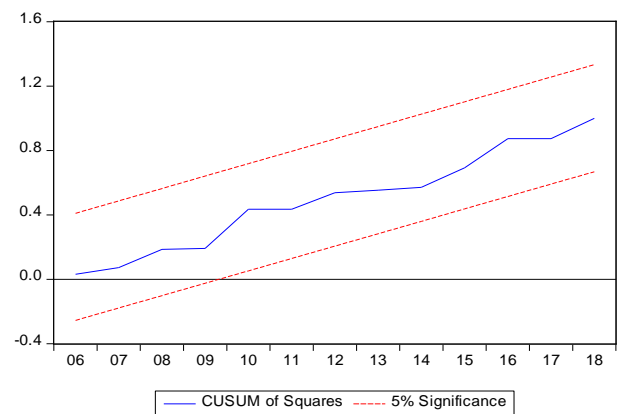


Figure 2. CUSUM of Square for non-oil Trade

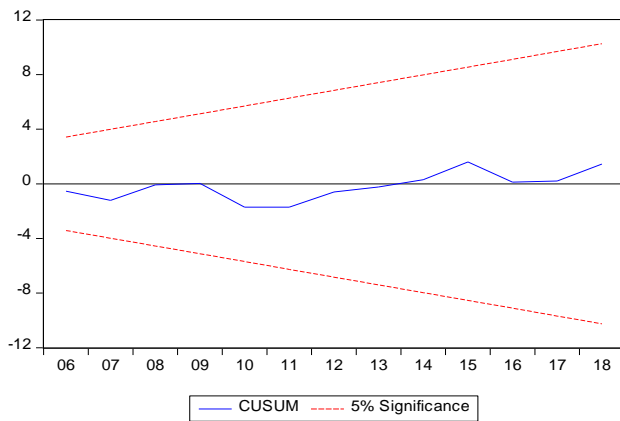


Figure 3. CUSUM for non-oil Import

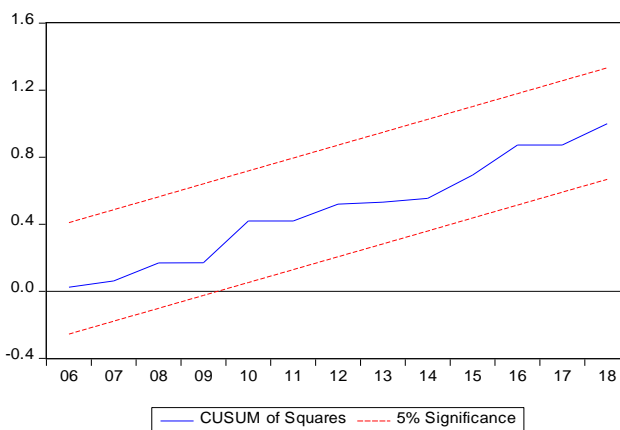


Figure 4. CUSUM of Square for non-oil Import

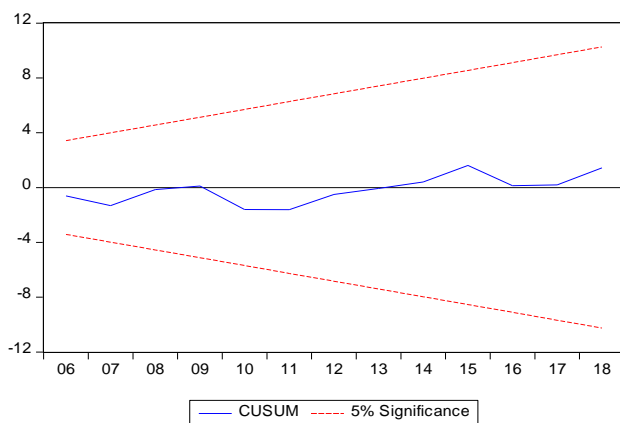


Figure 5. CUSUM for non-oil Export

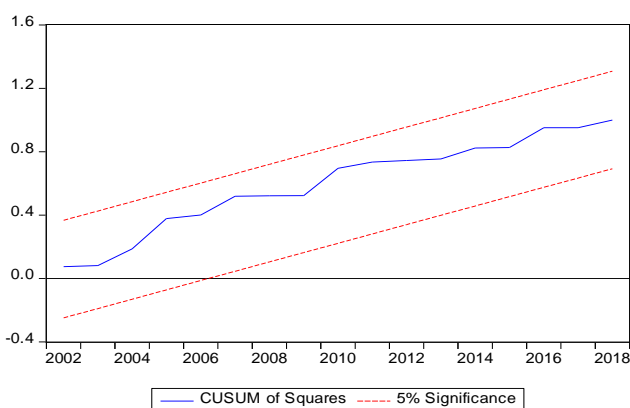


Figure 6. CUSUM of Square for non-oil Export

5. Conclusion

It is well documented that the Nigerian economy is driven by the export of natural resources especially crude oil but its impact on economic growth has reportedly been underwhelming. The essence of this research is to demonstrate that diversifying the economy is vital to achieving sustainable economic growth, which Nigeria needs most. The findings of the study further confirm the significance of international trade in non-oil sector to the growth and development of the Nigerian economy. The study found a positive and statistically significant relationship between non-oil trade openness, labour participation rate, capital formation, exchange rate and economic growth in Nigeria. These macroeconomic indicators of a growing economy like Nigeria, signify the need to improve further and enhance the macroeconomic environment for these variables to thrive and contribute more to economic growth.

The contribution of non-oil trade revealed the need to further diversify the Nigerian economy given the potential for positive and significant impact on economic growth especially in the perspective of export. Non-oil export trade openness also implies the benefit of a more open economy which has the potential to attract growth potentials from participation in globalization, most importantly when diversified. The implication of the findings revealed the need for Nigeria to formulate relevant policies and participate actively in international trade to tap the benefit that comes with it.

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