

IMPACT OF EXCHANGE RATE ON ECONOMIC GROWTH IN NIGERIA (1981-2016): AN ARDL APPROACH

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Abstract: *The study assessed empirically the impact of exchange rate on economic growth in Nigeria from 1981 to 2016. Data on GDP, Exchange rate, foreign direct investment (FDI), inflation rate, imports, exports, trade openness, final consumption expenditure (FCE), interest rate, and government expenditure were obtained from the different issues of the CBN Statistical Bulletin. Data series were assessed for stationarity with the aid of the ADF test. Bound test was conducted and the model was estimated within the ARDL framework supported by the relevant post estimation diagnostic tests. The bound test showed that there was long run relationship among the study variables. Model estimation revealed that import, lag of trade openness, FDI, lag of exchange rate, interest rate and inflation significantly affected the growth of the economy in the short run. In the long run, economic growth was affected by trade openness, FDI, exchange rate, government expenditure and interest rate. It was concluded that the present year exchange rate did not affect economic growth in the short run but its one year lag did, while exchange rate had negative effect on the growth of the Nigerian economy in the long run. To achieve growth in the economy, effective exchange rate management system alongside expansionary fiscal policy and encouragement of importation of capital goods are recommended.*

Key words: exchange rate, economic growth, Nigeria.

JEL Classification: F31.

1. Introduction

Money is an item that is acceptable generally as a medium of payment for goods and services and repayment of debt in a country. Money generally has different functions which are; measure of value, unit of account, store of value and standard for deferred payment. Since money is the key to exchange i.e. facilitates exchange, the rate at which goods are exchanged for each other depends on the value of money. Similarly, money is the determining factor of exchange between two countries which also depends on the value of each country's currency. This is because the value of each currency differs depending on the economic situation of each country and other accompanying macroeconomic dynamics. The comparison of different currencies of different countries is needed because of exchange which takes place across international borders through trade.

Exchange rate may be described as the price of a particular currency relative to the other. It can also be seen as a medium by which the prices of commodities in two different economies are connected together. According to Obansa, Okoroafor, Aluko & Millicent (2013), exchange rate determines the participation of external sector in cross-border trade. The issues of rate of interest and exchange rate regime have been a major topic of debates in international finance and in developing countries, with more countries liberalizing trade as means or pre-condition to achieving economic growth. Exchange rate can be seen as one of the very important and useful macroeconomic variables which a country uses to achieve its macroeconomic objectives of economic growth (e.g as being practiced by China, Japan and South Korea to stimulate export), reduction in unemployment level, price stability and increase in standard of living.

The traditional school is of the opinion that depreciated currencies will improve trade balance, solve the problems of balance of payment and increase employment and output only if the Marshall–Lerner conditions are met. The said condition is that currency depreciation will result into the growth of output if the addition of the price elasticity of demand for imports and price elasticity of demand for export is greater than one. The idea driving the direct effects is to enhance the local production of tradable goods, improve the competitiveness of export industries in international markets and stimulate local industries towards the use of more local raw materials (Iyoboyi & Muftau, 2014).

One of the main objectives of macroeconomic policy is significant growth in the economy of a country which is measured in terms of continuous growth in national income. Growth is actually perceived to have occurred when the productive capacity of a country improves (Akpan, 2008). Actual production of goods and services stimulates exports and sometimes requires importations (of raw materials) which involves transactions in foreign currencies (Oyovwi, 2012). Jin (2008) showed that the implications of Nigeria's over-dependence on export of oil is that the economy is highly prone to external shocks because in the event of any major fall in oil price, foreign exchange earnings will decline noticeably and there will be destabilizing effects on exchange rate as there will not be enough stock of foreign currencies to defend the local currency at the foreign exchange market. This major shift in relative prices (exchange rate) would result in a near equal adjustment in the allocation of a country's local resources and possibly move the economic structure away from the production of exportable commodities (agriculture) into possibly the services sectors.

The structural adjustment programme (SAP) was adopted owing to the unfavourable economic situation in the 1980's which made Nigeria to implement the devaluation policy. This policy was adopted mainly to discourage imports and encourage exports by increasing the nations' productivity and income thereof but there has not been noticeable increase in export since. The rate of currency exchange between the naira and United State Dollar for example continues to rise and imports continue to rise which was not the original motive of adopting and implementing the devaluation policy.

Furthermore, according to Nwosu (2016), exchange rates that emerged after the collapse of Bretton Wood System has been unstable and has made scholars and professionals to be skeptical about its effectiveness in enhancing economic growth. For instance, the naira to US Dollar exchange rate was ₦4 in 1987 while the real GDP was about N204.8Billion. In 1995, it depreciated to ₦21 to one US Dollar while the real GDP was ₦281.4B. As at 2014, the exchange rate was ₦168 to one USD and the exchange rate depreciated to ₦365 in 2017.

In the light of the above, it is important to evolve a research whose aim is to assess the intrinsic relationship existing between exchange rate and economic growth in Nigeria. This study bridges the knowledge gap by answering the relevant research question of "how does exchange rate affects economic growth in Nigeria" using most updated available data. Findings emanating from the study is expected to be useful for policy making aimed at achieving economic growth from the exchange rate point of view.

2. Literature Review

Purchasing Power Parity (PPP)

The exchange rate theory known as the Purchasing Power Parity was developed by a Swedish economist Gustav Cassel after the First World War. The term PPP is applied to a number of related but quite different ideas within international trade theory. The first interpretation of PPP is a strict one in which exchange rate equilibrium will exactly be determined by some ratio of prices. The second variant of the theory claimed that relative

price change is the only germane determinant of exchange rates. The third and most general interpretation considered price change as the primary determinant of the exchange rate. It however gave allowance for some useful secondary variables such as tariffs and other trade hindrances, capital flows, transport costs and expectations. Cassel's work actually espoused the third version. Majority of the criticisms by authors such as Ballassa (1964), Samuelson (1964) and Viner (1937) have been against the narrow version while authors who believe in the theory such as Keynes (1924) and Yeager (1958) argued for an intermediate or a most general version as an explanation for the exchange rate behaviour. In summary, it seems to be a significant acceptance of relative price changes as an important factor in determining exchange rates.

The notion of PPP enables the determination of the rate of exchange between two different currencies so that the rate will be at par with the purchasing power of the two concerned countries' currencies. This emphasizes that the rate of exchange of currencies between two economies is better determined by the purchasing power of their currencies.

The traditional Flow model

According to Augustus (2003) the traditional flow model perceived exchange rate as the outcome of the interaction between the supply and demand for foreign exchange. In the said model, the exchange rate will be in equilibrium when demand equals supply for foreign exchange (Olisadebe, 1991).

The Monetary Approach

This is the oldest approach in the determination of exchange rate. It is used as a measure for the comparison of the other methods in the determination of exchange rate. The monetary model assumes a simple demand for money curve. The monetary model in addition also assumes an aggregate supply curve which is vertical. This reflect a situation of flexible rather than constant output. It is worthy of note that the PPP is an important component of monetary approach (MA). The MA perceives exchange rate as the relative price of two asset (national monies) which is determined mainly by the demand for and supplies of those monies and that it is when economic agents willingly hold the existing stocks of the two monies that the equilibrium exchange rate is obtained (Gbosi, 2003). Hence, it is opined that a theory of exchange rate should be stated mainly in terms of the demand for and supply of the currencies.

Exchange rate policy in Nigeria.

A country can adopt any policy or mechanism by which she manages her exchange rate. Any policy adopted is geared towards achieving the macroeconomic objectives of a nation. Exchange rate directly or indirectly affects all the macroeconomic objectives but the degrees differ. By convention, some relationships exist between exchange rate and prices and/ or prices of goods traded among nations i.e. price of imports and exports; therefore, every nation seeks to adopt a reasonable exchange rate policy that will help her attain its objectives especially in the aspect of price stability and sustainable growth in the economy. Obadan (2007) stated that the decision about the choice of a particular regime of exchange rate alongside the appropriate level of the rate tends to be indeed a major important decision in any open economy due to the influence of exchange rate on the economy, the peoples' wealth, resource allocation, distribution of income, standard of living, balance of payment and some other equally important aggregate economic variables.

There are two major classifications of exchange rate systems which can be adopted by a country: These are the fixed exchange rate system and a flexible or floating exchange rate system. A fixed exchange rate system or regime is a system by which the rate of exchange of a particular country's currency relative to other currencies is predetermined by the country's highest monetary authorities (Central Bank of Nigeria in this case). It can

also be known as a regime by which the amount of a foreign currency (Dollar for instance) needed to get a domestic currency (the naira) or vice versa is fixed by the monetary authority who is usually saddled with such responsibility. Fixed exchange rate system has a number of advantages which include avoidance of upward and downward movements (fluctuations); encouragement of investment and control of inflation especially in an importing country like Nigeria.

A flexible or floating exchange rate is one in which the authority does not determine the price of the domestic currency. This is a regime in which the market dynamics determine the rate at which currencies are exchanged. The greatest advantage of this system is the monetary policy independence. However, the authorities make policies that influence the domestic interest rates and inflation. The disadvantages of the freely floating regime have been documented. These include persistent exchange rate volatility, high transaction cost and inflation.

Fapetu, and Oloyede (2014) assessed the nature of the relationship existing between foreign exchange management and economic growth in Nigeria. It was revealed that the type of management strategy adopted the country's foreign exchange did affect most economic variables which also subsequently affects growth in the economy. In the same vein, Eze and Okpala (2014) adopted some quantitative approach to assess the impacts which exchange rate policies have on Nigeria's economic growth and asserted that neither fixed nor flexible exchange rate matters in determining economic growth but what was important was the effectiveness of the management of the policy(s).

Economic growth.

Economic growth in simple terms may be described as the increase in the productivity or in the productive capacity of a country. There are many or diverse ways of measuring growth of an economy, the commonly used is gross domestic product (GDP). Others include per capita income e.t.c. Hence, growth can be defined as the rise in the GDP or an increase in the per capita income. In other words, it can be referred to as the increase in the productive capacity of a country. Gross domestic product can be described as the market value of all goods and services produced within a country usually a year. It can be measured as:

$Y = C + I + G + (X - M)$ where:

C = Consumption or consumer spending,

I = Investment

G = Government spending

(X - M) = Exports minus imports, or net exports.

Review of Some Previous Studies

Economic growth is usually measured as continuous increase in national income which results into increase in the quantity of goods and services produced in the country. The said production of goods and services usually further involve imports and exports which subsequently involve transaction in foreign currency. It is worthy of note that exchange rate is at the middle of the whole process and playing a pivotal role. Obadan (2007) stated that the decision about the choice of a rate of exchange regime alongside the appropriate rate appears to be the most important decision in an open economy due to the impact which exchange rate is likely to have on economic performance, the wealth of citizens, resource allocation, standard of living of the people, the balance of payment, income distribution and other aggregate economic variables. Several scholarly researches have assessed the relationships between exchange rate and economic growth. The outcomes of most these studies have been very diverse. For instance, Adeniran (2014) posited that exchange rate had no significant relationship with economic growth in Nigeria.

This emanated from a study covering the period from 1986 to 2013 which was analyzed using the ordinary least square (OLS) regression.

Nwosu (2016) assessed the impact of volatility in exchange rate on the growth of the Nigerian economy from 1987 to 2014 and reported that volatility (conditional variance) in exchange rate imparted negatively on economic growth in Nigeria. Amassoma and Adeniyi (2016) assessed the nexus existing between variations in exchange rate and economic growth in Nigeria from 1970 to 2013 and reported that exchange rate fluctuation did not significantly affect economic growth in both in the short run and the long-run. Obi *et al.*, (2016) also investigated the relationship which is likely to be existing between exchange rate regimes and economic growth in Nigeria using data from 1970 to 2014. Based on the results obtained from a Generalized Method of Moment (GMM) model, the study concluded that fixed exchange rate constrained economic growth while it was established that exchange regimes was indeed very important in the country's economy as the study's result revealed that deregulated exchange rate regimes enhanced economic growth.

The study of Azeez, Dada and Aluko (2014) established that volatility in exchange rate had positive and significant effect on macro-economic performance both in the long and short run. Because of exchange rate volatility, investors usually take advantage of a rising value of Naira to bring in the capital and technologies they require for their operations. Danmola (2013) carried out an analysis which bothered on the how the volatility of exchange rate affected macroeconomic variables in Nigeria and reported a positive influence of exchange rate volatility on GDP.

A study was carried out on the effect of exchange rate movement on economic growth in Nigeria by Akpan and Atan (2012). The study adopted a GMM approach to analyze a simultaneous equation model and reported that exchange rate movement did not significantly affect economic growth in Nigeria. Ismaila (2016) carried out a study aimed at assessing the relationship between depreciation in exchange rate and Nigeria's economic performance after the Structural Adjustment Programme (SAP) and no significant relationship was reported. Furthermore, Okorontah and Odoemena (2016) using data from 1986 and 2012 assessed effects which exchange rate fluctuations may have on economic growth of Nigeria. The study employed a combination of econometric methods and reported that there was no strong relationship existing between exchange rate and economic growth in Nigeria. However, Khondker (2012) reported a positive relationship between exchange rate depreciation and economic growth in Bangladesh. It was reported that a 10 percent depreciation in exchange rate resulted in 3.2 percent increase in economic growth. Though, majority of the studies reported a negative relationship between exchange rate and economic growth, some reported positive relationship while some reported no significant relationship. This diversity actually warrant further studies.

3. Methodology

Theoretical Framework

The study was based on the Keynesian model of an open economy which states that aggregate output in the economy (Y) equals the addition of the aggregate consumption in the country (C), aggregate investment (I) plus government expenditure plus (G) plus net income from abroad which is the difference between export and import of goods and services in the economy i.e. (X-M).

$$Y = C + I + G + (X - M)$$

$$Y = C + I + G + X - M \dots\dots\dots(1)$$

From economic theory it is widely known that exchange rate affects some of the variables in the model, for instance, exchange rate devaluation affects exports, imports and

investment in the economy. The present study included other variables believed to be relevant to economic growth.

Method of Data Analyses

(a) Pre-estimation

(i) **Descriptive Statistics:** Descriptive analyses of all the study variables was carried out. These included mean, median, maximum, range, standard deviations, skewness test, normality test e.t.c. In addition graphical illustration of the study variables were also carried out.

(ii) **Unit Root test:** This is necessary in order to examine whether the series had constant mean and variances over time (i.e whether they were stationary or not). If a series is stationary, such a series will be predictable, stable over time and it could be used for meaningful analyses and forecast with high predictive power. Therefore the stationarity of the series were assessed with the aid of Augmented Dickey-Fuller (ADF) test.

(iii) **Co-integration test:** The presence of long run relationship among the variables in the model otherwise referred to as cointegration of variables was assessed with the aid of the ARDL Bound test. Since the series were not integrated of the same order, the Engle-Granger co-integration test approach became inapplicable. Hence, the choice of the Auto-Regressive Distributed Lag Bounds Co-integration Test (Bound Testing Approach) became important and relevant.

(b) The Empirical Model

$$GDP = (EXR, INF, INT, FDI, TO, FCE, GEXP, IMP, EXP).....(2)$$

$$LNGDP_t = \lambda_0 + \lambda_1 LNEXR_t + \lambda_2 LNF_t + \lambda_3 LNINT_t + \lambda_4 LNFDI_t + \lambda_5 LNTO_t + \lambda_6 LNFCE_t + \lambda_7 LNIMP_t + \lambda_8 LNEXP_t + \lambda_9 LNGEXP_t + \mu_t(3)$$

Table 1: A priori expectations

Explanatory Variables	Sy mbol	Expected Sign
Exchange Rate of Naira to USD	EX R	Positive or Negative
Inflation Rate (in percentage)	INF	Positive or Negative
Interest Rate (in percentage)	INT	Negative
Foreign Direct Investment	FDI	Positive
Trade Openness (ratio of import + Export to GDP)	TO	Positive
Final Consumption Expenditure in Naira (in Naira)	FC E	Positive
Imports (value in Naira)	IM P	Positive or Negative
Exports (value in Naira)	EX P	Positive
Government Expenditure (in Naira)	GE XP	Positive

Dependent Variable: Gross Domestic Product (GDP)

Estimation Technique: The model was estimated based upon the result obtained from the unit root and the co-integration test. Since the series were integrated of different

orders i.e I(0) and I(1),Autoregressive Distributed Model (ARDL) estimation procedure where the short and the long run models were generated was adopted and it is stated as:

$$\begin{aligned} \Delta GDP_{it} = & \alpha + \mu \text{TREND} + \sum_{m=1}^M \theta_m \Delta GDP_{i,t-m} + \sum_{j=0}^J \vartheta_j \Delta EXR_{i,t-j} + \sum_{r=0}^R \theta_r \Delta INF_{i,t-r} \\ & + \sum_{p=0}^p \varphi_p \Delta INT_{i,t-p} + \sum_{q=0}^Q \delta_q \Delta FDI_{i,t-q} \\ & + \sum_{l=1}^L \epsilon_l \Delta TO_{i,l-1} + \sum_{d=0}^d \pi_d \Delta FCE_{i,t-d} + \sum_{b=0}^b \omega_b \Delta IMP_{i,t-b} \\ & + \sum_{\alpha=0}^{\alpha} Y_{\alpha} \Delta EXP_{i,t-\alpha} + \sum_{s=0}^s T_s \Delta GEXP_{i,t-s} + \lambda_1 EXR_t + \lambda_2 INF_t + \lambda_3 INT_t \\ & + \lambda_4 FDI_t + \lambda_5 TO_t + \lambda_6 FCE_t + \lambda_7 IMP_t + \lambda_8 EXP_t + \lambda_9 GEXP_t + E_t \end{aligned}$$

Data Sources: Data used in the study were sourced from the various issues of the Central Bank of Nigeria (CBN) statistical bulletin.

(c) Post-Estimation Analysis

As a follow-up to the main analyses, it was necessary to assess the validity of the estimated model and to determine whether some basic assumptions have been violated or not. Therefore, relevant tests examined under this section included the test for linearity using the Ramsey RESET test, test for normality of distribution of residual using Jarque-Bera test, heteroskedasticity using the ARCH-LM test and test for serial correlation using the Breusch-Godfrey test.

4. Results and Discussion

Description of Study Variables

Table 2 presents the descriptive statistics of the study variable. It presents the median, mean, standard deviation and other relevant statistics related to the distribution of the series. These included the skewness, kurtosis, and Jaque-Berra test statistic.

It was revealed that all the series in the study were positively skewed. The kurtosis analyses which shows the degree of peakedness revealed that only export, FDI and interest rate were mesokurtic in nature as their values were approximately three (3). Other variables were platykurtic in distribution as their values were lower than 3. The Jaque-Berra test of the normality of the series distribution utilizes information from both skewness and kurtosis. The results showed that export, FDI and government expenditure were not normally distributed while other variables were confirmed to be normally distributed.

Table 2: Descriptive Statistics of Study Variables

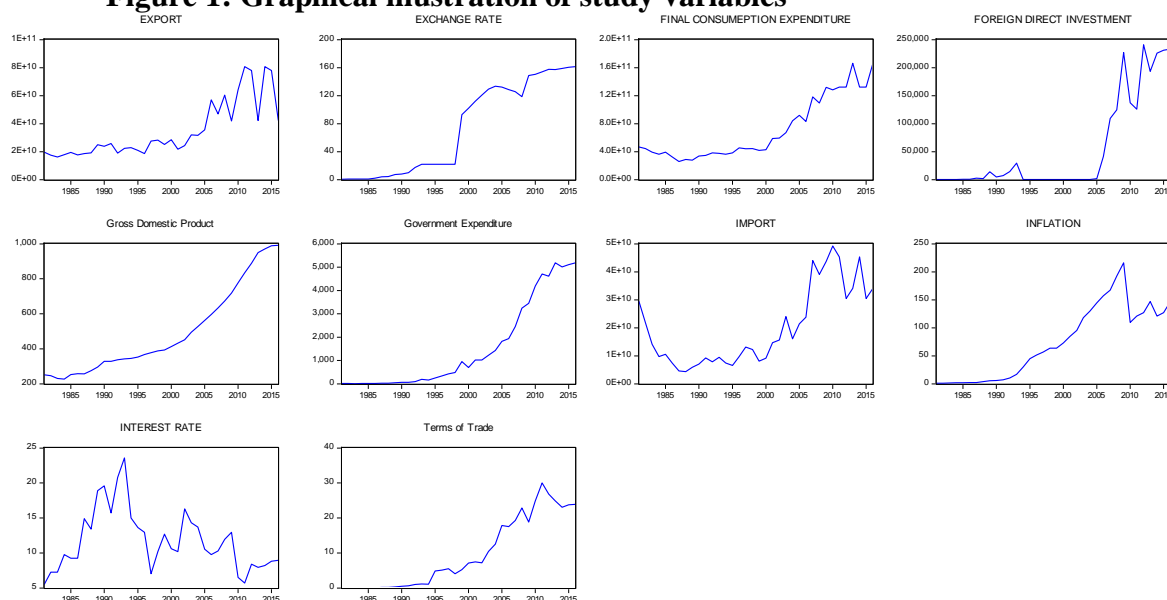
	EXP	EXR	FCE	FDI	GDP	GEXP	IMP	INF	INT	TO
Mean	3.48E+10	73.13	7.09E+10	54670.63	493.23	1541.06	2.00E+10	73.58	11.71	9.68
Median	2.54E+10	57.37	4.49E+10	1819.71	390.78	594.09	1.44E+10	63.56	10.40	5.37
Maximum	8.08E+10	161.31	1.66E+11	240994.5	991.11	5185.32	4.92E+10	215.99	23.60	30.05
Minimum	1.62E+10	0.61	2.60E+10	22.23	227.25	9.64	4.31E+09	1.03	5.50	0.06
Std. Dev.	2.02E+10	65.59	4.39E+10	86689.55	246.29	1879.67	1.40E+10	65.22	4.35	10.11
Skewness	1.24	0.11	0.84	1.26	0.85	0.97	0.74	0.37	0.86	0.61
Kurtosis	3.22	1.21	2.24	2.91	2.40	2.35	2.17	1.90	3.26	1.80
Jarque-Bera	9.32	4.89	5.13	9.49	4.95	6.26	4.36	2.65	4.52	4.38
Probability	0.01	0.09	0.08	0.01	0.08	0.04	0.11	0.27	0.10	0.11
Sum	1.25E+12	2632.65	2.55E+12	1968143.	17756.30	55478.07	7.19E+11	2648.89	421.71	348.61
Sum Sq. Dev.	1.43E+22	150561.7	6.75E+22	2.63E+11	2123193.	1.24E+08	6.87E+21	148890.0	663.26	3576.20
Observatn	36	36	36	36	36	36	36	36	36	36

Source: Author's computation, 2018.

Trends of the Study Variables

Figure 1 presents the graphical illustration of the various series in the study. Most of the series have been rising steadily with noticeable fluctuation overtime except for interest rate which started rising from 1981 reaching its maximum of about 24 percent in 1993 and had since fallen and has been fluctuating between 10 and 15 percent till date. The observed general upward trend of most of the series is not surprising as most economic variables tend to move together in the same direction depending on the nature of their relationships as background economic situations change.

Figure 1: Graphical illustration of study variables



Stationarity of the Study Variables

The series stationarity was examined with the aid of the ADF test. Non-stationary time series is known to produce spurious regression which may lead to faulty estimation, forecasting and ultimately policy recommendation and formulation. Hence, the need to know whether or not study series were stationary. All the variables except export were not stationary at level but became stationary after first differencing. They are therefore

integrated of order one i.e I(1) except export and import which were stationary at level i.e I(0) as presented in Table 3.

Table 3: Results of Augmented Dickey-Fuller Test for Stationarity of Study Variables

Variables	Level			First Difference			I(d)
	None	Intercept	Int&Trend	None	Intercept	Int&Trend	
LGDP	2.9863	0.4005	-2.6810	-1.908*	-3.922***	-3.916***	I(1)
LEXP	1.7954	-3.4466*	-3.95***				I(0)
LEXR	1.4587	-2.2232	-0.834	-4.10***	-4.93***	-5.52***	I(1)
LFCE	1.7796	0.5827	-2.8205	-6.18**	-6.61***	-7.13***	I(1)
LFDI	0.2679	-1.177	-1.7987	-6.264***	-6.285***	-6.216***	I(1)
LGEXP	-0.3835	-1.5278	0.2477	-0.6413	-1.8535	-4.5879***	I(1)
LIMP	0.0482	-1.1224	-3.482*				I(0)
INF	0.2165	-0.9534	-2.3181	-6.231***	-6.407***	-6.305***	I(1)
TOT	1.0837	-0.1950	-2.1950	-5.556***	-6.038***	-6.004***	I(1)

*Significant at 10% level, **Significant at 5% level, ***Significant at 1% level.

Source: Authors' computation, 2018

Lag Length Selection

In a bid to determining the appropriate lag-length for the ARDL model estimated, a lag length selection criteria test was performed. The Akaike Information Criteria (AIC) which penalizes heavily for over-parameterization was followed in selecting the appropriate lag-length (Table 4). The test revealed that a lag length of 2 was the most appropriate.

Table 4: Lag Length Selection Criteria Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-368.1197	NA	0.002163	22.24234	22.69127	22.39543
1	-100.8112	361.6526*	1.46e-07	12.40066	17.33889*	14.08474
2	57.47164	121.0398	2.96e-08*	8.972257*	18.39978	12.18731*

* indicates lag order selected by the criterion

Long Run Cointegration (Bound Test)

The ARDL Bound test for the presence of long run cointegration among the study variables was performed (Table 5). The F-statistic value of 6.38 which was higher in value compared with the upper bound value of 4.24 at 1 percent level implied the presence of long run cointegration among the variables.

Table 5: Result of ARDL Bound Test for Long Run Cointegration

Test Statistic	Bound Test Results		
F-Statistic	6.38		
Critical Test Bounds			
Significance Levels	I(0)	Lower Bound	Upper Bound I(1)
1%		2.97	4.24
2.5%		2.67	3.87
5%		2.43	3.56
10%		2.16	3.24

Source: Author's computation, 2018

Short Run Relationship

Table 6 shows the results of the estimated short run model of the impact which exchange rate and other macroeconomic variables on the growth of the economy. Exchange rate serves as a major link between a country's economy (especially through trade) with the outside world or other countries. The result showed that lagged series of exchange rate ($\alpha = 0.1$), one year lag of import ($\alpha = 0.05$), lag of Trade Openness ($\alpha = 0.05$), final consumption expenditure ($\alpha = 0.1$), inflation rate ($\alpha = 0.05$), interest rate ($\alpha = 0.05$) and time trend ($\alpha = 0.05$) significantly affected economic growth in the short run in Nigeria.

The present study results revealed that the current year exchange rate did not significantly affect economic growth. However, lagged series of exchange rate ($\alpha = 0.1$) had positive and significant effect on economic growth. Furthermore, a percent increase in exchange rate in the previous year resulted in 0.04 percent increase in economic growth in the present year. This finding is in favour of devaluation as means of stimulating economic growth. This may be achieved through aggressive encouragement of export which may eventually enhance economic growth. The finding in this study ran contrary to that of Okorontah (2016) who found no significant relationship between exchange rate and economic growth. However, the effect of lagged exchange rate was not reported in the study for proper comparison. The finding reported here is similar to that of Lawal (2016) after a study conducted on Nigeria.

Lag of import came up with a positive sign and a coefficient value of 0.06. This implied that one percent increase in import in the previous year increased economic growth by 0.06 percent in the present year. This is usually the case in a situation where majority of importations are on capital goods. Such good like equipment and machineries are engaged in production and services in the subsequent years. This finding corroborated that of Azeez *et al.*, (2014) which found a direct association between import and economic growth in Nigeria after a study covering the period from 2000 to 2012. Adesuyi and Odeloye (2013) study revealed a direct relationship between non-oil import and economic growth in Nigeria.

Trade openness is the ratio of the addition of import and export to GDP. The lag of trade openness had significant and negative effect on GDP. Contrastingly, current year value of trade openness had positive but non-significant effect. Nduka (2013) reported a positive relationship between trade openness and economic growth in Nigeria. It should however be noted that the present year trade openness did not have significant effect on economic growth in this study. Furthermore, in the shorth run, final consumption expenditure positively affect economic growth. One percent increase in final consumption expenditure resulted in 0.16 percent increase in economic growth.

The study revealed that inflation significantly and negatively affected economic growth. The negative effect of inflation on the economy is contrary to theory and this might be due to the very high inflation rate experienced in the country which might have been beyond the acceptable threshold to enhance noticeable economic growth. The negative influence of inflation on real growth in the economy reported in this study corroborated the assertion of Hossain *et al.*, (2012) that high inflation is not good for the economy. Interest rate was found to be significant and have positive (though, small) impact on the growth of the economy in the short run. This corroborates the finding of Maiga (2017).

The trend variable was positive and significant which indicated that economic growth has been trending upward overtime. The coefficient of the error correction term fulfilled the three conditions necessary for the confirmation of the presence of long run relationship in the model. These are being less than one, negative and significant. The error

correction term value of -0.68 which was significant at 1 percent implied that 68 percent of the disequilibrium in the system due to external shock in the previous year is restored back in the current year. In effect, it takes less than two (2) years for the system to restore back unto its long run equilibrium path in the event of any disequilibrium due to an external shock on the system.

Table 6: Short Run Model Result

Variable	Coefficient	t-Statistic	Prob.
D(LGEXP)	-0.0167	-0.8751	0.4020
D(LIMP)	0.0178	0.5882	0.5694
D(LIMP(-1))	0.0602**	3.1142	0.0110
D(TO)	0.0015	0.4738	0.6458
D(TO(-1))	-0.0058**	-2.2723	0.0464
D(LFDI)	-0.0061	-1.2020	0.2570
D(LFDI(-1))	-0.0029	-0.9411	0.3688
D(LFCE)	0.1629*	1.8760	0.0901
D(LEXR)	0.0039	0.2198	0.8304
D(LEXR(-1))	0.0431*	2.1287	0.0591
D(LEXP)	0.0559	1.5483	0.1526
D(INF)	-0.0006**	-2.4153	0.0363
D(INF)	-0.0005	-1.5502	0.1521
D(INT)	0.0070**	2.8112	0.0184
D(@TREND())	0.0237**	2.8530	0.0172
CointEq(-1)	-0.6875***	-4.9692	0.0006

***Significant at 1%, **Significant at 5% and *significant at 10%

Source: Authors' computation, 2018

Results of the Long Run Model

The long run analysis results revealed that trade openness in line with *a priori* expectation had positive and significant effect on economic growth. This is contrary to the negative effect in the short run. It may be that the positive effect of trade openness took some times to manifest. The positive relationship is in line with the findings of Nduka (2013). Surprisingly, FDI had negative effect on economic growth in the long run while exchange rate had negative relationship with the growth of the Nigeria economy in the long run. Government expenditure was found to be significant (at 10 percent) and had positive effect on economic growth. Government expenditure has the potential of significantly initiating improvement in GDP especially with expansionary fiscal policy. In the same vain, the significance and the positive sign of the trend variable coefficient revealed that economic growth has been trending positively over time (Table 7).

Table 7: Result of the Static (Long run) Model

Variable	Coefficient	t-Statistic	Prob.
LGEXP	-0.0242	-0.8881	0.3953
LIMP	-0.0885	-1.4120	0.1883
TO	0.0226**	2.9901	0.0136
LFDI	-0.0229*	-1.8444	0.0949
LFCE	0.2369	1.6672	0.1264
LEXR	-0.0589*	-2.0989	0.0622
LEXP	0.1522*	2.1892	0.0534
INF	-0.0002	-0.6204	0.5488
INT	0.0203**	3.1543	0.0103
C	-1.8953	-0.5757	0.5775
@TREND	0.0344***	4.6480	0.0009

***Significant at 1%, **Significant at 5% and *significant at 10%

Source: Authors' computation, 2018

Post Estimation Diagnoses

Table 8 presents the results of the post estimation analyses. The ARCH-LM test was used to assess the existence of heteroscedasticity in the estimated model. Given the probability level which was more than the acceptable level of 5 percent the null hypothesis of “no heteroscedasticity” could not be rejected. Hence, it was concluded that the model was homoscedastic. The Jarque-Bera test for the normality of the residual revealed that the residuals were normally distributed. The residual of the estimated model was free from serially correlation (autocorrelation) considering the results of the Breusch-Godfrey test. The Ramsey-RESET test was carried out to examine the linearity of the model or to confirm if the model was well specified. The high probability level implied that the null hypothesis of linearity of the model could not be rejected. Hence, it was confirmed that the model estimated was had constant variance, normally distributed, free from autocorrelation and well specified (Table 8).

Table 8: Post Estimation Diagnosis Results

Econometric Problem	Test Procedure	Statistics (Probability)	Conclusion
Heteroscedasticity	ARCH-LM	0.6374 (0.4246)	No heteroscedasticity in the model
Normality	Jarque-Bera	1.230 (0.5401)	Residual Normally Distributed
Autocorrelation	Breusch-Godfrey LM	24.38 (0.8970)	The is no autocorrelation in the model
Linearity Test	Ramsey Reset	0.0024 (0.9667)	The model is well specified

Note: Figures in parenthesis are probability values

Source: Author's computation, 2018

4. Conclusion and Recommendations

It was concluded that current year exchange rate did not have any significant influence on economic growth. However, the lag of the exchange rate did have significant effect in the short run. Meanwhile, exchange rate had significant and negative (but marginal) effect on economic growth in the long run. It may be deductively concluded that exchange rate is not a major determinant of economic growth in Nigeria in the short-run while exchange rate depreciation is expected to stimulate economic growth in the long-run as it takes some times before the effect of such devaluation on the economy begins to manifest. The implication of this is that exchange rate can be used to spur economic growth in Nigeria. Furthermore, import, lag of trade openness, final consumption expenditure, government expenditure and interest rate significantly drive the economy.

Building on the major findings of this study, it was recommended that effective exchange rate management capable of enhancing economic growth should be adopted while the concerned authorities should open up the economy to beneficial foreign trade. In addition, sequel to the significance of government expenditure in the estimated model, expansionary fiscal policy may be adopted by the government in order to enhance the growth of the economy.

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