Isola, Lawal Adedoyin

Article

Exchange rate fluctuation and the Nigeria economic growth

EE
E u r o E c o n o m i c a

ISSUE 2(35)/2016 *ISSN: 1582-8859*

Exchange Rate Fluctuation and the Nigeria Economic Growth

Lawal Adedoyin Isola[1], Atunde Ifeoluwa Oluwafunke[2], Ahmed Victor[3], Abiola Asaleye[4]

Abstract: The aim of this study is to investigate the impact of exchange rate fluctuation on economic growth in Nigeria within the context of four profound theories: purchasing power parity; monetary model of exchange rates; the portfolio balance approach; and the optimal currency area theory. Data was collected from the CBN statistical bulletin in Nigeria from 2003– 2013and the Autoregressive Distributed Lag (ARDL) model was employed to estimate the model. In the model, real GDP (RGDP) was used as the proxy for economic growth while Inflation rate (IF), Exchange rate (EXC), Interest rate (INT) and Money Supply(M2) as proxies for other macroeconomic variables. The empirical results show that exchange rate fluctuation has no effect on economic growth in the long run though a short run relationship exist between the two. Based on these findings, this paper recommends that the Central bank for policy purposes should ensure that stern foreign exchange control policies are put in place in order to help in appropriate determination of the value of the exchange rate. This will in the long run help to strengthen the value of the Naira.

Keywords: Exchange rate; economic growth; Nigeria; ARDL

JEL Classification: C18; C24; G12; G24

1. Introduction

In Nigeria today, exchange rates and its constant movement is of great importance to the general public because one way or the other its fluctuation has an effect on the competence of the economy to attain optimal productive capacity. This is alarming given its macro-economic importance specifically in a high import dependent country like Nigeria (Olisadebe, 1991).The Exchange rate reflects the ratio at which one currency can be exchange with another currency, namely the ratio of currency prices. It is the value of a foreign nation's currency in terms of the home nation's currency. It also specifies how much one currency is worth in terms of the other. A correct or appropriate exchange rate has been one of the most important factors for economic growth in the economies of most developed countries, whereas regular fluctuations or inappropriate exchange rate has been a major obstacle to economic growth of many African countries of which Nigeria is inclusive.

[1] Department of Accounting and Finance, Landmark University, Omu Aran, Kwara State, Nigeria, lawal.adedoyin@lmu.edu.ng.
[2] Department of Accounting and Finance, Landmark University, Omu Aran, Kwara State, Nigeria, lawal.adedoyin@lmu.edu.ng.
[3] Dept. of Economics, Landmark University, PMB 1001, Omu Aran, Kwara State, Nigeria. lawal.adedoyin@lmu.edu.ng.
[4] Dept. of Economics, Landmark University, PMB 1001, Omu Aran, Kwara State, Nigeria. lawal.adedoyin@lmu.edu.ng.

Since Nigeria's independence in October 1960, her monetary authorities has pursued vigorously the objectives of internal and external balance in a desperate bid to raise the standard of living, alleviate poverty and acquire economic and political power, stability and prestige. They did this by administratively adjusting the foreign exchange rate of the domestic currency *Vis-a Vis* the peculiar and prevailing economic situations (Osuka & Osuji, 2008).After all of government's effort put in place to stabilize the exchange rate, why is there still a fluctuation in the rate and does it affect economic growth? In other words, the paper intends to know whether or not, if the fluctuation in the exchange rate exert on economic growth. Answering this question is important to virtually all the various economic agents; for instance, policy makers will find the answer useful in knowing what policy to pursue when determining appropriate exchange rate policy. Investors (both institutional and private) will also find the result interesting as it will help in determining their expectations as to changes in exchange rate influences on economic growth and of course market performance. The objectives of the paper are hypotheses in their null form such as (i) exchange rate fluctuation has a significant impact on the Nigeria economic growth and development; (ii) fluctuations in exchange rate alters monetary policy variables.

The rest of the paper is structured as follows: Section two deals with literature review; Section three centers on methodology; Section four presents the results and Section five concludes the paper.

2. Literature Review

2.1. Theoretical Framework

Though there are several theories on the connections between exchange rate fluctuations and economic growth, four of these theoretical views are relevant to our study. Each of the four theories relevant to our study is briefly discussed here.

2.1.1. Optimal Currency Area (OCA) Theory

The earliest and leading theoretical foundation for the choice of exchange rate regimes rests on Optimal Currency Area (OCA) Theory, developed by Mundell (1961) and McKinnon (1963).

This theory is concerned with stabilization of the business cycle and trade. It is based on concepts of the symmetry of shocks, the degree of openness, and labor market mobility. According to the theory, a fixed exchange rate regime can increase trade and output growth by reducing exchange rate uncertainty and thus the cost of hedging, and also encourage investment by lowering currency premium from interest rates. However, it can also reduce trade and output growth by stopping, delaying or slowing the necessary relative price adjustment process.

Modern exchange rate theories are based on the monetary and the asset market or portfolio balance approaches to the balance of payments, and views the exchange rate, for the most part, as a purely financial phenomenon. A traditional exchange rate theory, on the other hand, is based on trade flows and contributes to the explanation of exchange rate movement in the long run. With financial flows now dwarfing trade flow, interest has shifted to modern exchange rate theories, but traditional theories remain important in the long run (Salvatore, 2011).

2.1.2. Purchasing Power Parity

The theory of purchasing power parity (PPP) illustrates the relation between prices and exchange rate. Even though the origins of the PPP concept is traceable to the Salamanca School back in the 16th-century Spain, its modern use as a theory of exchange rate determination began with the work of Gustav Cassel (1918), who recommended PPP as a means of amending pre–World War I exchange rates parities for countries resolved to return to the gold standard system after the conflicts ended. Some modification was necessary because countries that left the gold standard in 1914 witnessed extensively different rates of inflation during and after the war. As a principle of exchange rate determination, the easiest and powerful form of PPP (i.e. absolute PPP) is based on an international multi-good edition of the law of one price. Absolute PPP envisage that the exchange rate should adjust to equate the prices of national baskets of goods and services between two countries because of market forces driven by arbitrage.

2.1.3. The Monetary Model of Exchange Rates

This theory postulates that exchange rates are determined in the process of equilibrating or balancing the stock or total demand and supply of money in each nation. According to the monetary approach, the nominal demand for money is stable in the long run and positively related to the level of nominal national income but inversely related to interest rate. The nation's money supply is equal to its monetary base times the multiplier. The nation's monetary base is equal to the domestic credit created by its monetary authorities plus its international reserve. Unless satisfied domestically, an excess supply of money in the nation results in an outflow of reserves, or a balance of payment deficit under fixed exchange rates and a depreciation of the nation's currency(without any international flow of reserves) under flexible exchange rate. The opposite takes place with an excess demand for money in the nation.

2.1.4. The Portfolio Balance Approach

The portfolio balance approach also called the asset market approach differs from the monetary approach in that domestic and foreign bonds are assumed to be imperfect substitutes, and by postulating that the exchange rate is determined in the process of equilibrating or balancing the stock or total demand and supply of financial assets (of which money is only one) in each country. Thus portfolio balance approach can be regarded as a more realistic and satisfactory version of the monetary approach. In the portfolio balance model, individual and firms hold their financial wealth in some combination of domestic money, domestic bond, and a foreign bond denominated in foreign currency.

2.2. Empirical Literature:

Past research on the impact of exchange rate fluctuation on economic growth has reached contrasting results. For instance, a number of empirical evidences show that real exchange rate fluctuation can affect growth outcomes. Some other schools of thought are of the views that no significant relationship exist between exchange rate and economic growth.

Edwards and Levy Yeyati (2003) found indications that countries with more flexible exchange rate grow faster than those without. Faster economic growth is extensively associated with real exchange rate depreciation (Hausmann, Pritchett & Rodrik, 2005). Rodrik (2008) was of the opinion that real undervaluation promotes economic growth, increases the profitability of the tradable sector, and leads to an enlargement of the share of tradable in domestic value added. He stated that the tradable sector in

developing countries can be too small because it suffers more than the non-tradable sector from institutional weaknesses and market failures. A real exchange rate undervaluation works as a second-best policy to compensate for the negative effects of this misinterpretation by enhancing the sector's profitability. Higher profitability promotes investment in the tradable sector, which then expands, and promotes economic growth.

Harris (2002) using the Generalized Least Square technique revealed that real exchange rate, when properly managed affect productivity and growth in both the short and long run, the result is coherent with the competitiveness hypothesis, which suggests that exchange rate depreciation boost productivity and growth in the short run. Aghin et al (2006) in their study also found that the effect of exchange rate volatility, which is the aftermath of how well the economy is managed on real activity is relatively small and insignificant. This is in resonance with the findings of Dubas and Lee (2005), which both discovered a robust relationship between exchange rate stability and growth. Moreover, the result suggests that membership of the (South) Eastern and Central European countries in the European Monetary Union would have a positive impact on these countries' growth rates

In the same vein, Hossain (2002) agreed that exchange rate helps to relate the price systems of two different economies by ensuring the possibility for international trade and it also effects on the volume of imports and exports, as well as country's balance of payments position. Rogoffs and Reinhartl (2004) also pronounced that developing countries are relatively better off in the choice of flexible exchange rate regimes.

Odusola and Akinlo (2003) discovered a mixed result on the impacts of the exchange rate depreciation on the output in Nigeria. In the medium and long term, exchange rate depreciation exercised an expansionary impact on output, but in the short run exchange rate depreciation does not expand output. This result partially verifies what Rano-Aliyu found using Vector Error Correction Model (VECM) technique while Odusola and Akinio used VAR and VECM. So, the difference in their results can be credited to the difference in their methodologies.

Rano-Aliyu (2009), carried out a study in Nigeria, and he discovered that the appreciation of exchange rate exercise positively impacts on real economic growth in Nigeria. Although the appreciation of the exchange rate will lead to a loss of competitiveness, since the economy primarily does not have the capacity to appropriate gains through competitiveness it is therefore more gratifying when the currency appreciate than when it depreciates. This is due to the fact that appreciation will dampen inflation, boost domestic investment, savings and enhance the standard of living.

Aliyu (2011) affirmed that appreciation of exchange rate brings about increased imports and reduced exports while depreciation would expand export and discourage import. Also, depreciation of exchange rate is likely to cause a shift from foreign goods to domestic goods. Thus, it leads to diversion of income from importing countries to countries exporting through a shift in terms of trade, and this tends to have impact on the exporting and importing countries' economic growth.

Asher (2012) analyzed the impact of exchange rate fluctuation on the Nigerian economic growth for period of 1980 – 2010. The result revealed that real exchange rate has a positive effect on the economic growth. In a related study, Akpan (2008) examined foreign exchange market and economic growth in

an emerging petroleum based economy from 1970-2003 in Nigeria. He realized that positive relationship exists between exchange rate and economic growth.

Obansa et al (2013) also investigated the relationship between exchange rate and economic growth in Nigeria between the years 1970–2010. The result stipulated that exchange rate has a strong impact on economic growth. They established that exchange rate liberalization was good to the Nigerian economy as it promotes economic growth. Azeez, Kolapo and Ajayi (2012) also analyzed the effect of exchange rate volatility on macroeconomic performance in Nigeria from 1986 – 2010. They revealed that exchange rate is positive related to Gross Domestic Product. Adebiyi and Dauda (2009) with the use of error correction model disputed on the contrary, that trade liberalization promoted growth in the Nigerian industrial sector and stabilized the exchange rate market between 1970 and 2006. To them, there was a positive and significant relationship between index of industrial production and real export. A one per cent rise in real export increases the index of industrial production by 12.2 per cent. By inference, it means that the policy of deregulation influenced positively on export through exchange rate depreciation.

However, previous studies have also revealed that exchange rate has no significant effect on economic growth performance. For example, Bosworth, Collins, and Yuchin (1995) presented evidence that in a large sample of industrial and developing countries, that real exchange rate volatility impede economic growth and reduces productivity and growth. Ubok-udom (1999) analyzed the issues surrounding the implementation of SAP in Nigeria, and drew up a deduction that the peculiar features of Nigerian economy limits the efficacy of currency depreciation in producing desirable effects. From the study of the relationship between exchange rate variation and growth of the domestic output in Nigeria (1971-1995); he expressed growth of domestic output as a linear function of variations in the average nominal exchange rate. In addition he used dummy variables to capture the periods of currency depreciation. The empirical result revealed that all coefficients of the major explanatory variables have negative signs. David, Umeh and Ameh (2010) also analyzed the effect of exchange rate fluctuations on Nigerian manufacturing industry. They employed multiple regression econometric tools which showed a negative relationship between exchange rate volatility and manufacturing sector performance.

The mixed or inconclusiveness of the results coupled with the emphasis placed on the impact of exchange rate fluctuation on economic growth as shown in various government policies in Nigeria is the motivation for this study.

3. Data and Methodology

Data for this study were sourced from Central Bank of Nigeria Statistical Bulletin (various issues). The data spanned from 1980Q1 to 2013Q4.

3.1. Model specification:

The model is expressed as follows:

$$EXC = f(GDP, INF, INT, M2) \quad (1)$$

Where the variables are GDP, Exchange Rate, Inflation Rate, Interest Rate and Money Supply.

Exchange Rate= EXT

Economic Growth= GDP

Inflation Rate= INFT

Interest Rate= INT

Money Supply= M2

3.1.2. ARDL Model Specification

The choice of ARDL is influenced by its advantageous positions over other estimation techniques like Granger causality, Engle and Granger (1987), Johansen (1991), Johansen and Juselius (1990) and Gregory and Hansen (1996) which often require that the variables are of the same order of integration, besides their preference for large data size for validity of results to hold[1] (Babajide et al, 2016).

An autoregressive distributed lag model is considered as

ARDL Model Specification

An autoregressive distributed lag model is considered as

(ARDL (1, 1) model: $y_t = \square\square\square\square\square_1 y_{t-1} + \square_o x_t + \square_1 x_{t-1} + u_t$…………… (2)

Where y_t and x_t are stationary variables, and u_t is a white noise.

Generalizations:

Using the lag operator L applied to each component of a vector, $L^k x_t = x_{t-k}$, it is easy to define the lag polynomial A(L) and the vector polynomial B(L)

The ARDL (p,q) model:

With

A (L) yt = $\square + \square\square L \square x_t + u_t$,

$A(L) = 1 - \square\square_1 L - \square\square_2 L^2 - \ldots - \square\square_p L^p$, $B(L) = 1 - \square\square_1 L - \square\square_2 L^2 - \ldots - \square\square_q L^q$……………(3)

Hence, the general ARDL (p, q_1, q_2, …, q_k) model:

$A(L) y_t = \square\square\square\square\square\square\square L \square x_{1t} + \square\square\square L \square x_{2t} + \ldots + \square\square\square L \square x_{kt} + u_t$. If A(L) = 1, the model becomes a distributed lag model (no lags of y_t).

The ARDL estimation is as follow:

$$\Delta \mathrm{EXC}_t = \beta_{01} + \sum_{i=1}^{n1} \beta_{11}\, \Delta EXC_{i-t} + \sum_{i=0}^{n2} \beta_{12}\, \Delta \mathrm{InRGDP}_{t-i} + \sum_{i=0}^{n3} \beta_{13}\, \Delta \mathrm{INF}_{t-t} + \sum_{i=0}^{n4} \beta_{14}\, \Delta \mathrm{INT}_{t-i} + \sum_{i=0}^{n5} \beta_{15}\, \Delta \mathrm{InM2}_{t-i} + \phi_{11} \mathrm{EXC}_{t-1} + \phi_{12} \mathrm{In}RGDP_{t-1} + \phi_{13} \mathrm{INF}_{t-1} + \phi_{14} \mathrm{INT}_{t-1} + \phi_{15} \mathrm{In}M2_{t-1} \varepsilon_{t1} \ldots \quad (4).$$

[1] See (Babajide & Lawal, 2016).

Where *In* is the log of the variables, RGDP represent the Real Gross Domestic Product; INT represent interest rate; INF represent inflation rate; EXC represent exchange rate. Δ represents the first difference operator, β_{01} ….β_{05} are the constant terms; β_{11} ….β_{55} represents the short run coefficients, ϕ_{11} …..$\phi_{55}$are the long run coefficients, n_1 ….n_5 are the lag length and ε_{t-1} ….. ε_{t-5} represents the white noise error terms.

We formulate the H_0 and H_1 hypothesis so as to be able to test the existence of the short and long runs relationship among the stated variables as follows:

H_0: no long-run relationship	H_1: a long-run relationship
$\phi_{11} = \phi_{12} = \phi_{13} = \phi_{14} = \phi_{15} = 0$	$\phi_{11} \neq \phi_{12} \neq \phi_{13} \neq \phi_{14} \neq \phi_{15} \neq 0$
$\phi_{21} = \phi_{22} = \phi_{23} = \phi_{24} = \phi_{25} = 0$	$\phi_{21} \neq \phi_{22} \neq \phi_{23} \neq \phi_{24} \neq \phi_{25} \neq 0$
$\phi_{31} = \phi_{32} = \phi_{33} = \phi_{34} = \phi_{35} = 0$	$\phi_{31} \neq \phi_{32} \neq \phi_{33} \neq \phi_{34} \neq \phi_{35} \neq 0$
$\phi_{41} = \phi_{42} = \phi_{43} = \phi_{44} = \phi_{45} = 0$	$\phi_{41} \neq \phi_{42} \neq \phi_{43} \neq \phi_{44} \neq \phi_{45} \neq 0$
$\phi_{51} = \phi_{52} = \phi_{53} = \phi_{54} = \phi_{55} = 0$	$\phi_{51} \neq \phi_{52} \neq \phi_{53} \neq \phi_{54} \neq \phi_{55} \neq 0$

H_0: no short-run relationship	H_1: a short-run relationship
$\beta_{11} = \beta_{12} = \beta_{13} = \beta_{14} = \beta_{15} = 0$	$\beta_{11} \neq \beta_{12} \neq \beta_{13} \neq \beta_{14} \neq \beta_{15} \neq 0$
$\beta_{21} = \beta_{22} = \beta_{23} = \beta_{24} = \beta_{25} = 0$	$\beta_{21} \neq \beta_{22} \neq \beta_{23} \neq \beta_{24} \neq \beta_{25} \neq 0$
$\beta_{31} = \beta_{32} = \beta_{33} = \beta_{34} = \beta_{35} = 0$	$\beta_{31} \neq \beta_{32} \neq \beta_{33} \neq \beta_{34} \neq \beta_{35} \neq 0$
$\beta_{41} = \beta_{42} = \beta_{43} = \beta_{44} = \beta_{45} = 0$	$\beta_{41} \neq \beta_{42} \neq \beta_{43} \neq \beta_{44} \neq \beta_{45} \neq 0$
$\beta_{51} = \beta_{52} = \beta_{53} = \beta_{54} = \beta_{55} = 0$	$\beta_{51} \neq \beta_{52} \neq \beta_{53} \neq \beta_{54} \neq \beta_{55} \neq 0$

Our decision as to whether to accept or reject H_0 (existence of no-co integration among the variables) is guided by the following procedures (Pesaran *et al,* 2001):

If F_s > upper bound, reject H_0, thus the variables are co-integrated;

If F_s < lower bound, accept H_0, thus the variables are not co-integrated;

However, if $F_s \geq$ lower bound and $\leq$ upper bound, the decision will be inconclusive.

4. Analysis and Interpretation of Results

Augmented Dickey Fuller Unit root test was used to test for the stationarity of each variable. After which the autoregressive distributed lag was conducted to determine the existence of cointegration among the variables.

4.1. Descriptive Statistics and Test for Variables Normality:

Table 4.1. Descriptive Statistics

	EXC	RGDP	INT	INF	M2
MEAN	139.8787	1.238583	10.95455	11.88182	3.323117
MEDIAN	133.6508	6.671433	12.000000	11.700	3.580605
MAXIMUM	158.2074	21.76893	16.500000	28.8	37.66733
MINIMUM	117.7256	-96.39948	6.000000	4.1	-99.89880
STD.DEV	13.80807	20.62040	3.173873	4.564793	17.93176
SKEWNESS	0.007096	-2.597353	-0.084587	0.846133	-4.258121
KURTOSIS	1.492403	12.48918	1.904266	3.649962	26.52031
JARQUE-BERA	4.167259	214.5540	2.253628	6.024590	1147.147
PROBABILITY	0.124478	0.000000	0.324064	0.049179	0.00
OBSERVATIONS	44	44	44	44	44

Source: Author Computation (2016) Using E-Views 7

Statistical characteristics of all variables are shown in Table 4.1 above. The Jarque-Bera (JB) test statistic was employed to ascertain whether macro-economic variables and exchange rate follow the normal probability distribution. The JB test of normality is an asymptotic or sizeable sample test, which calculates the skewness and kurtosis measures and uses the following test statistics:

JB=N (S2/6+ (K-2)2/24)

While N= sample size, S=skewness coefficient, and K= Kurtosis coefficient. For a distributed variable with normality, S=0 and K=3. Hence, the JB test of normality is a test used for the joint hypothesis that S and K are 0 and 3 respectively.

Ultimately we can see that all the variables are not normally distributed apart from inflation rate whose skewness coefficient is close to zero (0.846133) and kurtosis coefficient is 3.649962.

4.2. Test for Stationarity

The test for stationarity or unit root test is done using the augmented dickey fuller (ADF) unit root test. To verify whether there is a presence of unit root or the series are stationary we explore the time series characteristics of the variables (GDP, EXC, INF, M2, and INT). A variable is alleged to be stationary when it has no unit root which is represented in literature as 1(0). A non-stationary variable can have one or more unit root and it is represented by *I*(d), d is used to denote the number of unit root that the variable possesses and by inference, the number of unit roots that the variable must be differenced in order to make it stationary.

Augmented Dickey –Fuller (ADF) test has been composed which is the revised version of Dickey-Fuller (DF) test. ADF makes a parametric correction in the original DF test for hither correlation by supposing that the series follows an AR (p) process. ADF design introduced here is as follows:

$$\Delta Y_t = \square b_{\square} \square \square \square Y_{t-1} + \mu Y_{t-1} + \mu_{\square} Y_{t-2} + \ldots\ldots\ldots + \mu_p Y_{t-p} + \epsilon_t \qquad (5)$$

Where, Y_t represent time series to be tested, $b_{\square\square}$ is the intercept term, $\square\square$ is the coefficient of interest in the unit root test, $\mu_{\square\square}$ is the parameter of the augmented lagged first difference of Y_t to represent the

p^{th} order autoregressive process, and ϵ_t is the white noise error term. In analyzing unit root test we expect to test the following hypothesis:

Ho: $\beta=0$ (non stationary)

If we reject the null hypothesis this means that the times series is stationary. The decision criteria involve a comparison between computed ADF test statistics values with the MacKinnon critical values for the rejection of a hypothesis for a unit root. If the computed ADF test statistics is less negative (i.e. lays to the right of the MacKinnon critical values) relative to the critical values, we accept the null hypothesis of non-stationarity in time series variable.

Table 4.2. Summary of ADF unit root test

Variables	ADF test statistics	Mackinnon critical value @ 5%	No of time differenced
EXC	-1.117749	-2.93315	*I*(1)
RGDP	1.406736	-2.936942	I(1)
INF	-2.86514	-2.931404	I(1)
INT	-1.809676	-2.931404	I(1)
M2	-6.60075	-2.931404	I(0)

Source: Authors Computation (2016) using E-view 7

In Table 3 above, we present the results of the ADF test of stationarity for all the variables both in levels and first difference forms. From our results, the result shows that we cannot reject the null hypothesis of unit roots for all the variables in level form except for money supply that is stationary at level I(0). However, when the ADF test was applied at first difference for each of the variables, the results show that we can reject the null hypothesis. The implication is that variables are stationary for the order *I*(1). Base on the fact all the variables are stationary at least at I(1), the study proceed to testing whether or not the variables are co-integrated.

Table 4.3. Test for long and short run relationship

LONG RUN RELATIONSHIP				SHORT RUN RELATIONSHIP			
REGRESSOR	COEFFICIENT	T-RATIO	Probability	REGRESSOR	COEFFICIENT	T-RATIO	Probability
RGPD	-30.2215	-.3234	0.748	RGDP	-.13747	-2.253	0.030
INF	43.03100	.42786	0.671	INF	.19573	1.5051	0.140
INT	-0.23179	-.2076	0.837	INT	-.1068E-3	-.3202	0.751
M2	20.4849	.33434	0.740	M2	0.93171	1.5601	0.734
				ECM	-0.34	-.3423	0.007

Source: Author Computation (2016) Using Microfit 4.0

The ARDL result of both the short and long run relationship between the variables is presented above. From the result it can be deduced that when exchange rate is the dependent variable, no significant relationship exist between exchange rate and inflation rate in both short and long run. This implies that inflation rate has a positive but no significant effect and on exchange rate. Also there is no significant relationship between exchange rate and interest rate in both the short and long run, so therefore interest

rate has a negative and no impact on exchange rate. Likewise no relationship exists between exchange rate and money supply. But unlike the other variables there is a negative and significant relationship between exchange rate and real GDP in the short run and no relationship in the long run. In comparison, the finding in this study is consistent with Asher (2012) in relation with GDP in the short run, Apkan (2008), Obansa et al in relation to GDP. However the result of this finding is different from Adebiyi (2009) that identified an insignificant relationship between exchange rate and GDP in both the short and long run. Also Bosworth (1995), Aghion et el (2009), Eichengreen and lebtang (2003), Eme and Johnson (2012) all attested to the fact that no short or long run relationship exist between exchange rate and economic growth. Different outcomes between this paper and some previous studies may be attributable to model specifications, variables definition and measurements, sample period, methodologies used in empirical works etc.

The Error Correction Model (ECM) shows the speed of adjustments back to equilibrium the estimated model. A significant relationship with a negative sign for the ECM implies the speed of adjustment from disequilibrium in last period to current period (Narayam & Smyth, 2005). The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 34% as shown by the coefficient of ECM (-1). From our result, it can be deduced that the ECM (-1) coefficient is negative and significant at 5% level of significance.

In testing the stability of the estimated ARDL model of the long run viz-a-viz short run relationship between exchange rate and the macroeconomic variables, the employed the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Square (CUSUMQ) graphs. The decision rule is that, all the coefficients of the error correction are stable and the null hypothesis cannot be rejected provided that the plots stay within 5% range of the significance level (i.e. within the two straight lines), if otherwise we reject the null hypothesis (Bekhet & Matar, 2013), Odhibomo (2010), (2009), Bahmani-oskoe and Bohl (2002), Pesaran and Smith (2001). As shown in figures 1a and 1b, both plots lies within the critical boundaries, this implies that the long run coefficients of the exchange rate function is stable.

4.4. Tests for Hypothesis

Hypothesis one

Hypothesis one in its null form state that exchange rate fluctuation has a significant impact on Nigeria economic growth and development.

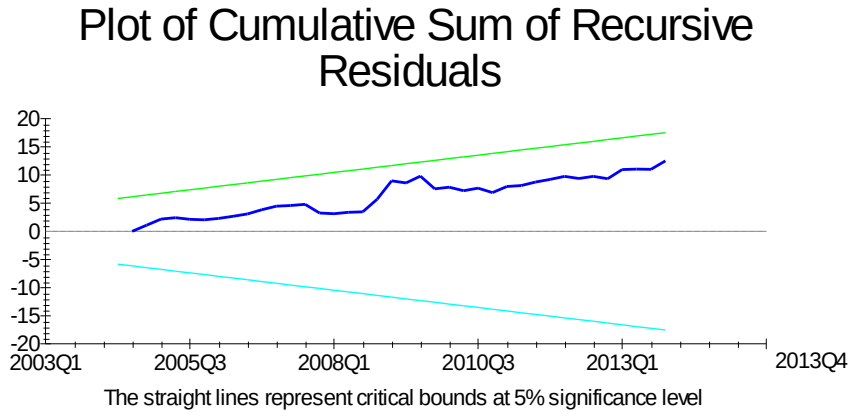
As shown in the result of the ARDL estimates and Error correction model the exchange rate fluctuation has no effect on economic growth in the long run though a short run relationship exist between the two. The implication of the result is that in the short run when economic growth is the target of policy makers, manipulating the exchange rate regime will induce an increase in RGDP though this relationship dissolves in the long run. The ECM value of -0.34 has shown a feedback of about 34% from the previous period disequilibrium of the present level of GDP. The null hypothesis should therefore be accepted in the short run and rejected in the long run, while the alternative hypothesis should be rejected in the long run but accepted in the short run.

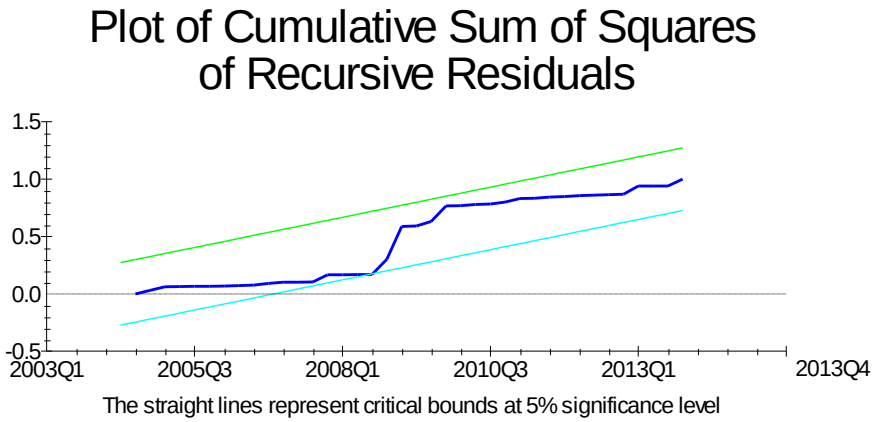
Hypothesis two

Hypothesis two in its null form states that fluctuation in exchange rate alters monetary policy variables.

As shown in the result of the ARDL estimates and Error correction model above where by relationship between exchange rate and monetary policy variables are not significant. The exchange rate did not alter monetary policy variables of interest rate, inflation rate and money supply in both short and long run. So therefore we reject the null hypothesis and accept the alternate hypothesis.

Finally to check the estimated ARDL model stability of the long term coefficient with the short run dynamics between exchange rate and monetary policy variables, the cumulative sum of recursive residual (CUSUM) and the cumulative sums of squares (CUSUMQ) (Bahmani-Oskooee & Bohl, 2000; Brown et al 1975; Pesaran & Pesaran, 1997) was employed. If the plot of the CUSUM sand CUSUMQ statistics stays within the 5% range of significance (within the two straight lines), the null hypothesis states that all coefficient in the error correction model are stable and cannot be rejected (Bahmani-Oskooee & Ng, 2002). If either of the lines is crossed, the null hypothesis of the coefficient consistency can be rejected at 5% level of significance. The figure below reveals that the plot of CUSUM and CUSUMQ statistics stays within the critical boundaries showing stability of the long run coefficient of exchange rate.





5. Summary, Recommendations and Conclusion

This study examined the impact of exchange rate fluctuation on economic growth in Nigeria. It made use of the Autoregressive Distributed Lag to analyze quarterly data sourced on the Nigerian economy from 1980 -2013 so as to examining the connections between exchange rate fluctuations and economic growth. The result of the ARDL model displayed the absence of a long run relationship between the exchange rate and real GDP, though a short run relationship exist between the two. Furthermore, the result of the coefficient of the error correction model has the expected sign (-0.34) and is highly significant at 5% level of significance, this represent the speed of adjustment back from the long run disequilibrium to the short run equilibrium. The result of the CUSUM and CUSUMQ stability tests as shown in Figures 1a and 1b attests to the fact that the co-efficient of the error correction model are stable.

Our findings revealed that exchange rate fluctuation has negative impact on economic growth in the long run and a positive impact in the short run. This is in line with most studies this study is consistent with Apkan (2008) and Asher (2012) in relation with GDP in the short run. However the result of this finding is different from Adebiyi (2009) that identified an insignificant relationship between exchange rate and GDP in both short and long run. Also Bosworth (1995), Aghion et al (2009), Eichengreen and Lebtang (2003), Eme and Johson (2012) all attested to the fact that no short or long run relationship exist between exchange rate and economic growth. Different outcomes between this paper and some previous studies may be attributable to model specifications, variables definition and measurements, sample period, methodologies used in empirical works etc.

The empirical results as shown in the result of the ARDL estimates and Error correction model the exchange rate fluctuation has no effect on economic growth in the long run though a short run relationship exist between the two. The implication of the result is that in the short run when economic growth is the target of policy makers, manipulating the exchange rate regime will induce an increase in RGDP though this relationship dissolves in the long run. The ECM value of -0.34 has shown a feedback of about 34% from the previous period disequilibrium of the present level of GDP. The null hypothesis should therefore be accepted in the short run and rejected in the long run, while the alternative hypothesis should be rejected in the long run but accepted in the short run.

Sequel to the findings of this study, the study offers recommendations relevant to policy makers, investors, financial institutions regulators and future researchers. The study suggests that policy makers should come up with adequate strategic policy that will stabilize the foreign exchange rate as well as other major macro-economic variable so as to achieve growth and development in the economy. Some of the policies suggested include:

1. Stern foreign exchange control policies should be put in place in order to help in appropriate determination of the value of the exchange rate. This will in the long run help to strengthen the value of the Naira.

2. Interest rate needs to be maintained at its minimum in order that the purchasing power of the average Nigerian will increase.

3. High dependence on import needs to be discouraged by the impositions of stern tariffs.

4. An adequate and appropriate environment and infrastructural facility needs to be kept in place so as to attract foreign investors thereby leading to foreign direct investment. This will thereby lead to job creation, employment opportunities and at the long run improve the people's standard of living.

5. Lastly the government needs to induce the foreign exchange rate by enacting positive economic reforms that will minimize the unfavorable effect of fluctuation of the exchange rate on the Nigerian economy with respect to trade flows and economic growth.

6. References

Adebiyi, M.A & Dauda, R.O.S (2009). Trade liberalization policy and industrialization growth performance in Nigeria: An error correction mechanism technique. *Being a paper presented at the 45th annual conference of the Nigerian economic Society*, 24th to 26th August, Central Bank of Nigeria new building auditorium. Abuja.

Aghion, P.; Bacchetta, P.; Ranciere, R. & Rogoff, K. (2009). Exchange rate volatility and productivity growth: the role of financial development. *Journal of Monetary Economics*, 56 (4), pp. 494–513.

Akinlo & Odusola (2003). Assessing the impact of Nigeria's naira depreciation on output and inflation: Policy Implication. *West African Journal of Monetary and Economic Integration*, 6(1).

Akpan, P.L. (2008). Foreign exchange market and economic growth in an emerging petroleum based economy: Evidence from Nigeria (1970-2003). *African Economic and Business Review*, 6(2), pp. 46-58.

Aliyu, S.R.U. (2011). Impact of oil price shock and exchange rate volatility on economic growth in Nigeria: An empirical investigation. *Research Journal of International Studies*.

Arize, A.C.; Osang, T. & Slottje, D.J. (2000). Exchange-rate volatility and foreign trade: evidence from thirteen LDCs. *Journal of Business and Economic Statistics*, 18(1), pp. 10–17.

Asher O.J (2012). The Impact of Exchange rate Fluctuation on the Nigeria Economic Growth (1980 – 2010). *Unpublished B.sc Thesis of Caritas University Emene*, Enugu State, Nigeria.

Azeez, B.A.; Kolapo, F.T & Ajayi, L.B (2012). Effect of Exchange rate Volatility on Macroeconomic Performance in Nigeria, *Interdisciplinary Journal of Contemporary Research in Business*. 4(1), pp. 149-155.

Babajide, A.A. & Lawal, A.I. (2016). Macroeconomic behaviour and FDI inflows in Nigeria: an application of the ARDL model. *British Journal of Economics, Finance and Management Sciences*, 11(1), pp. 84-107.

Babajide, A.A.; Lawal, A.I. & Somoye, R.O (2015). Monetary Policy Dynamics and the Stock Market Movements: Empirical Evidence from Nigeria. *Journal of Applied Economic Sciences Volume X*, Issue 8(38), pp. 1179-1188.

Babajide, A. A.; Lawal, A.I. & Somoye, R.O (2016). Stock market response to economic growth and interest rate volatility: evidence from Nigeria. *International Journal of Economics and Financial Issues*, 2016, 6(1), pp. 354-360.

Bachetta, P. & van Wincoop, E. (2000). Does exchange rate stability affect trade and welfare? *American Economic Review*, 90, pp. 1093-1109.

Bahmani-Oskooee, M. & Bohl, M.T. (2000). German monetary unification and the stability of the German M3 money demand function. *Economic letters* 66(2), pp. 203-208.

Bahmani-Oskooee, M.; Ng, W. (2002). Long run demand for money in Hong Kong; An application of the ARDL model. *International Journal of Business and Economics* 1(2), pp. 147-155.

Bailliu, Jeannine, Robert Lafrance & Jean-Francois Perrault (2003). Does exchange rate policy matter for growth? *International Finance*, 6(3), pp. 381-414.

Barkoulas, J.T.; Baum, C. & Caglayan, M. (2002). Exchange rate effect on the volume and variability of trade flows. *Journal on International Money and Finance*, 21, pp. 481-406.

Bosworth, B.; Collins, S. & Yu-chin, C. (1995). Accounting for Differences in Economic Growth. *Unpublished manuscript*. Brookings Institution, Washington, DC.

Brown, R.; Durbin, J. & Evans, K. (1995). Techniques for testing the constancy of regression relationship over time. *Journal of the Royal Statistics Society Series B (methodological)*, pp. 149-192.

David, U. & Ameh, A. (2010). The Effect of exchange rate fluctuations on Nigeria manufacturing sector. *African Journal of Business Management* 4(14), pp. 2994-2998.

Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy*, 84, pp. 1161-1176.

Dubas, J.M.; Lee, B.J. & Mark, N.C. (2005). Effective exchange rate classifications and growth. *NBER Working Paper*, 11272.

Edward, S. & Levy Yeyati, E. (2003). Flexible exchange rate as shock absorber. *NBER Working paper*, 9867.

Egwaikhide, F.O.; Louis, Chete, N. & Gabriel, O.F. (1994). Exchange Rate Depreciation, Budget Deficit and Inflation—the Nigerian Experience. *AERC Research Papers*, no. 26. Nairobi: African Economic Research Consortium.

Ehsani, M.; Khanalipour, A. & Abbasi, J. (2009). Effect of exchange rate volatility on exports to Iran. *Journal of Economic Sciences*, 9(1), pp. 13-34.

Eichengreen, B. & Leblang, D. (2003). Exchange rates and cohesion: historical perspectives and political-economy considerations. *Journal of Common Market Studies*, 41, pp. 797–822.

Ekpo, A.H (2004). *Macroeconomic Model of the Nigerian economy.* Vantage Publishers Ibadan.

Eme, O.A & Johnson, A.A (2012). Effect of exchange rate movements on economic growth in Nigeria. *CBN Journal of Applied Statistics*, 2(2), pp. 1-28.

Engel, C. & John R. (2001). Violating the law of one price: Should we make a federal case out of it? *Journal of Money, Credit and Banking*, 33, pp. 1-15.

Engel, C. (1999). Accounting for U.S. real exchange rate changes. *Journal of Political Economics*, 107, pp. 507-538.

Engel, Charles (1993). Real exchange rates and relative prices. An empirical investigation. *Journal of Monetary Economics* 32, pp. 35-50.

Engle, R.F. & Granger, C.J. (1987). Cointegration and error-correction-representation, estimation and testing. *Econometrica* 55, pp. 251–278.

Gregory, A.W. & Hansen, B.E. (1996). Tests for cointegration in models with regime and trend shifts. *Oxford Bulletin of Economics and Statistics*, 58, pp. 555–560.

Harris, R.G. (2002). New economy and the exchange rate regime. *Center for International Economics Studies, Discussion paper*, No 111.

Hausmann, R.; Pritchett, L. & Rodrik, D. (2005). Growth Accelerations. *Journal of Economic Growth* 10(4), pp. 303–29.

Hossain, A. (2002). Exchange rate responses to inflation in Bangladesh. Washington D.C. *IMF Working Paper*, No. WP/02/XX.

Jafari, M. (1999). The effect of real exchange rate on the economic growth; case study of the economy of Iran during the period 1959-1996. *Master Thesis*, Faculty of Humanities and Social Sciences Mazandaran University.

Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, pp. 169 – 210.

Johansen, S. (1991). Estimation and hypothesis testing of co-integration vectors in Gaussian vector autoregressive models. *Econometrica*, 59, pp. 1551 – 1580.

Jorjorzadeh, N. & Basirat, L. (2014). The effect of exchange rate fluctuations on economic growth considering the level of development of financial markets in selected developing countries. *Applied Economics*, 3, pp. 691-703.

Kyereme, S. (2004). Effects of exchange rate volatility and changes in macroeconomic fundamentals on economic growth in Ghana. *Institute of Statistical, Social and Economic Research (ISSER).*

McKinnon, R. (1963). Optimal currency areas. *American Economic Review*, 53, pp. 717-724.

Mordi, C.N (2006). Challenges of exchange rate volatility in economic management in Nigeria. I*Bullion*, 30(3). July - Sept.

Mundell, R.A. (1961). A theory of optimal currency areas. *American Economic Review*, 51, pp. 509-517.

Obadan, M.I. (1994). *Nigeria's Exchange Rate Policy and Management*. Ibadan: NCEMA Publication.

Obansa, S.A.J.; Okoroafor, O.K.D.; Aluko, O.O. & Millicent, Eze (2013). Perceived relationship between exchange rate, interest rate and economic growth in Nigeria: 1970-2010. *American Journal of Humanities and Social Sciences:* 1(3), pp. 116-124.

Ogun, O (2006). Real exchange rate behaviour and non-oil export growth in Nigeria. *African Journal of Economic Policy*, 11(1), June.

Okereke, Emeka J. (1994). Exchange rate fluctuations and microeconomic stability in Nigeria. The Nigerian experience (1970-2001), *Unpublished PhD Thesis*, FUTO.

Okoroafor, O.K.D. (2010). *Money, inflation and economic growth in Nigeria*: 1970-2008. In Nigeria Macroeconomic Development: Issues and Challenges. Edited by Adam, J.A & Obansa, SAJ. Abuja-Nigeria, pp. 1-49.

Olisadebe, E.U. (1991). Appraisal of recent exchange rate policy measures in Nigeria. *CBN Economic and Financial Review*, 29(2), pp. 452-465.

Oweoye, O. & Onagowora, O.A. (2007). M2 targeting, Money demand and real GDP growth in Nigeria: Do rules apply? *Journal of Business and Public affairs*, 1(2), pp. 541 -560.

Oyejide & Udun (2010). *Exchange rate regime and economic growth: evidence from developing Asian and advanced European economies*. Retrieved from: www.cgu.edu.include/huang.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*, 289-326.

Pesaran, M. & Pesaran, B. (1997). *Microfit 4.0 (windows version).* New York: Oxford University Press Inc.

Rano-Aliyu, S.U. (2009). Impact of oil price shock and exchange rate volatility on economic growth in Nigeria: An Empirical Investigation. *Research Journal of International Studies* – Issue 1, 21-34.

Rodrik, d. (2008). The real exchange rate and economic growth. *Brookings papers on economic activity*, *2*, 365–412.

Rogers, J. & Michael, J. (1995). Haircuts and hysteresis: Sources of movements in real exchange rates. *Journal of International Economies*, 38, pp. 339-360.

Rogoffs, K. & Reinhart, C.M. (2004). The modern history of Exchange rate arrangements: A reinterpretation. *Quarterly Journal of Economics*, 119(1), pp. 1-47.

Sanni, G.K. (2006). Nigeria's external trade and the new perspective for its enhancement. *CBN Bullion*, 30(1), 74-86

Schnabel, G., (2008). *Exchange rate volatility and growth in small open economy at the EMU periphery*. Leipzing University.

Servén, L. (2003). Real-exchange-rate uncertainty and private investment in LDCs. *Review of Economics and Statistics*, 85, pp. 212–18.

Soyibo, A.O. (2010). Interest rate policy and the promotion of savings, investment and resource mobilization. *Research Report 24*, Development Policy Centre, Ibadan.

Tony, E. (2002). *Interest and exchange rates management in Nigeria: A Macroeconomic Implications.*

Ubok-Udom, E.U. (1999). Currency depreciation and domestic output growth in Nigeria: 1971-1995. *The Nigerian Journal of Economics and Social studies*, 41(1), pp. 31-44.

Unugbro, A.O. (2007). The impact of exchange rate fluctuation on capital inflow: The Nigerian experience. *The Nigeria Academic Forum*, Vol. 13(2).