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Exchange Rate Fluctuations and Economic Growth in Nigeria: An Empirical Investigation

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Abstract:
This study examines the effect of exchange rate fluctuations on economic growth in Nigeria using annual data for the period 1970-2016. Specifically, the study seeks to: investigate the existence of a long-run relationship between exchange rate and economic growth in Nigeria; and determine the nature of the causal relationship between exchange rate and economic growth in Nigeria. The study employs the Johansen test of Co-integration, Error Correction Model, and the Granger Causality test to address the specific objectives. The study reveals that: there exists a long run relationship between exchange rate and economic growth in Nigeria. Furthermore, the Error Correction Mechanism (ECM) result reveals that it takes approximately two years for the disequilibrium in the long run trend of GDP to be corrected back to the equilibrium level. The Granger Causality Test reveals that there is no causality between economic growth and exchange ratein Nigeria. The study therefore recommends, amongst others, policies that will not only ensure a realistic and stable exchange rate but will also encourage local production to boost national output.

Keywords: *Exchange rate, economic growth, co-integration, causality, Nigeria*

1. Introduction

Foreign exchange rate plays a critical role in the realization of the macroeconomic stability of countries in the global economy as it not only determines a country's level of international trade but also has enormous implications for economic growth and development. Consequently, exchange rate is the most important price in the economy as it affects the general price level of goods and services. The exchange rate is an important relative price which enhances the linkages between domestic and foreign markets for goods and services. It also signals the competitiveness of a country's exchange power with the rest of the world in a pure market. Besides, it also serves as an anchor which supports sustainable internal and external macroeconomic balance over the medium to long term (Ismaila, 2016).

The relationship between exchange rate volatility and economic growth still remains of immense interest to economists, especially in an emerging economy like Nigeria. This interest extends also to the degree of internal and external effects of the exchange rate fluctuations on the economy. Exchange rate fluctuation is one of the endogenous factors that affect the performance of the economy of a nation (Yaqub,2010). There is a consensus in the literature that devaluation or depreciation could boost domestic production through stimulating the net export component. This is evident through the increase in international competitiveness of domestic industries leading to the diversion of spending from foreign goods whose prices become high comparatively to domestic goods (Dada and Oyeranti, 2012).Indeed, the miserable economic performance in Latin America, Asia and Africa can be linked to real exchange rate performance (Cottani, Cavallo, and Khan, 1990). It is pertinent to note that the economic performance of any country hinges greatly on a host of factors which include: a formidable and effective management of the exchange rate as well as a sound and realistic exchange rate policy.

In Nigeria, due to the enormous implications of the exchange rate for international trade, economic stability, external balance and competitiveness (via the mechanism of the relative prices of foreign and local commodities, services and assets) the exchange rate has become an important macroeconomic variable (Seyi, 2012). Moreso, the exchange rate reflects the economic strength and competitiveness with other economies, thus, it is an important economic measurement (Asinya and Takon, 2014; Akonji, 2013). Most importantly, a country's economic objectives are the strong factors in determining the exchange rate of such country. The strength of a country's currency depends on a number of factors. The so include the state of the economy in terms of its competitiveness and volume of its exports, the level of domestic production, and the quantum of foreign reserves (CBN, 1999).

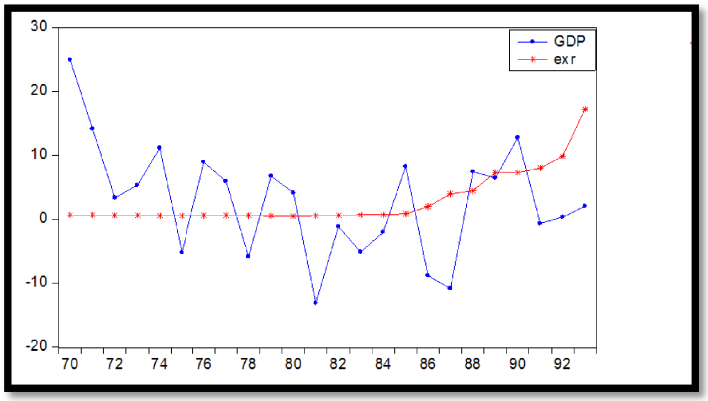

Figure 1: Trend of Exchange Rate and Economic Growth (1970-1993)
Source: Central Bank of Nigeria Statistical Bulletin (various issues)

There is a general consensus in the literature that exchange rate fluctuations influence domestic output performance. For instance, Obansa (2012), Fapetu (2013) and Danmola (2013) found that exchange rate fluctuations influence economic growth in Nigeria. Exchange rate fluctuations influence domestic prices through their effects on aggregate supply and demand. A currency's depreciation results in higher import prices while a currency's appreciation results in lower import prices. The potentially higher cost of imported inputs associated with exchange rate depreciation increases marginal costs and leads to higher price of domestically produced goods (Kandil, 2004). Also, import-competing firms might increase their prices in response to foreign competitor price increases to improve profit margins.

Available data on the Nigerian economy (CBN, various issues) reveals that real exchange rate was relatively stable during the fixed regime but it fluctuated throughout the floating regime. On the other hand, growth rate of real gross domestic product (GDP) has been fluctuating throughout the period 1970-2016. Figure 1 graphically presents the trend of exchange rate and growth rate of GDP in Nigeria during the period from 1970-1993. The trend shows that while exchange rate was fairly stable until the year 1987, the economic growth of Nigeria was on a good note in the 1970's as the period coincided with the end of civil war which necessitated the need for massive reconstruction activities. The depreciation in currency value in the 1975 led to a sharp decline in economic growth by -5.8%. This led to the recession and economic deterioration as manifested by fiscal crisis and foreign exchange shortage. Indeed the growth rate of GDP was negative in 1986, 1987, 1991, and 1995.

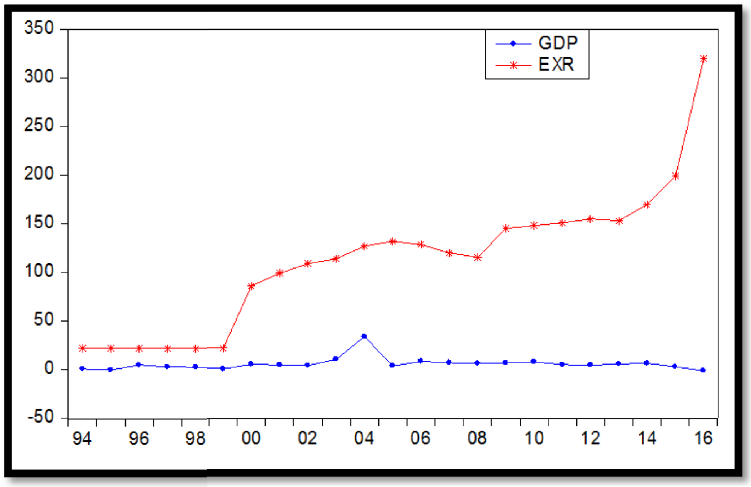

Figure 2: Trend of Exchange Rate and Economic Growth (1994-2016)
Source: Central Bank of Nigeria Statistical Bulletin (various issues)

Despite all the policies adopted by government to achieve stability in exchange rate especially in the last two decades. Naira continued to depreciate against the American dollar. Also, the economic output continued to experience diverse changes as a result of the fluctuations caused by exchange rate as shown in figure 2. The fluctuations became intense from the year 1999 to 2016, despite policy efforts by the government and other relevant monetary authorities to stabilise exchange rate. The volatility in the exchange rate has been pinpointed as one of the causes of low level in the value of output in Nigeria.

Is there any relationship between exchange rate and economic growth in Nigeria? Do the fluctuations in exchange rate have long run implications for output performance in Nigeria? Is there any causal relation between exchange rate and economic growth in Nigeria? These and more are the questions which this paper seeks to answer. Thus, the broad objective of this study is to examine the effect of exchange rate fluctuations on economic growth in Nigeria using annual

data for the period 1970-2016. Specifically, the study seeks to investigate the existence of a longrun relationship between exchange rate and economic growth in Nigeria; and determine the nature of the causal relationship between exchange rate and economic growth in Nigeria.

This study is relevant to government and policy makers as it will provide the required information needed for policy formulation and implementation. In addition, it will serve as a reference material for students and researchers who are interested in this area of study. This study will also help to enlighten the relevant authorities, businessmen and indeed the general public about the apparent exchange rate - growth nexus in order to guide their investment decisions. The paper is organized in five sections. Section 1is the Introduction while section 2 contains the Literature Review. Section 3 presents the Methodology of Research employed in this study. The Empirical Results and Findings are presented in section 4. Finally, section 5 of this study presents the Summary, Conclusion and Recommendations.

2. Literature Review

2.1. Theoretical Framework

There are several theories on the subject of exchange rate and economic growth. However, for the purpose of this paper, the relevant theories are the Mundell Flemming theory and the new growth theory.The Mundell- Flemming theory states that an economy cannot simultaneously maintain a fixed exchange rate, free capital movement and an independent monetary policy. The theory implies that the behaviour of an economy depends on an exchange rate system that further prompts its movements (fluctuations). The Mundell Flemming theory is an extension of the IS-LM model. However, unlike the traditional IS-LM model which uses interest rate as the determining factor in the interactions of monetary and fiscal policy and their effect on output, the Mundell Flemming model uses the exchange rate as the determinant of output level following the interactions of the goods and money market. The M-F (Mundell Flemming) equations examine the shortrun fluctuations in a small open economy. It has the equation,

$$Y= C(y-t) + I(r) + G + Xn(e) \quad \ldots(1)$$

Where, Y is aggregate income; C is the sum of consumption after tax; I is investment as determined by interest rate, G is the level of government expenditure and Xn is the export. The Net exports (Xn) depend negatively on exchange rate (e) that is, $(Xn\ (e) < 0)$.

2.2. Empirical Literature Review

Several studies have empirically investigated the relationship between exchange rate and economic growth in most countries of the world. Some studies have revealed a positive relationship between exchange rate and economic growth. For instance, see Tarawalie (2010), Mahmmod, Ehsanullah and Ahmed (2011), Ditimi and Odeniyi (2016), Seetanah and Padachi (2011), Joans (2012), Attah-Obeng, Enu, Osei-Gyimah, and Opoku (2013),Kogid, Asid, Lily, Mulok and Loganathan (2012), Pius (2006), Kennedy (2010), Sibanda (2012),Adeniran, Yusuf and Adeyemi (2014), Apollos, Emmanuel and, Olusegun (2015), Inam and Umobong (2015), Usmanand Adejare (2013), Fapetu (2014), Akpan (2009), Asher (2012), Danmola (2013), Oladapo and Oloyede (2014), Obansa, Okoroafor, Aluko and Millicent (2013).

On the contrary, some studies reveal a negative relationship between exchange rate and economic growth. For instance, see Oude (2013), Toulaboe (2007), Huang (2004),Azu, and Nasiri (2015), Jerumeh, Akinribido, Popoola, Oke, Ogunnubi and Okoruwa (2016), Some studies reveal a long run relationship between exchange rate and economic growth. For instance, see Kogid, Asid, Lily, Mulok and Loganathan (2012),and Jerumeh, et al (2016). However, Isola, Oluwafunke, Victor, and Asaleye (2016) revealed that exchange rate fluctuation has no effect on economic growth in the long run though a short run relationship exists between the two variables.

3. Research Methodology

3.1. Nature and Sources of Data

Data used for this work are purely secondary in nature. They are annual time series data obtained from sources such as: the Central Bank of Nigeria Statistical Bulletin (2015) and the National Bureau of Statistics publication of various issues (2014). The data spanned the period 1970-2015.

3.2. Model Specification

The model adopted in this study is drawn from the postulations of the Marshall Lerner condition with some structural modification. Thus, this study specifies the following model:

$$GDP = F\,(\underset{(-)}{EXR},\ \underset{(+)}{OPN},\ \underset{(+)}{MS},\ \underset{(-)}{INTR},\ \underset{(+)}{TGE},\ \underset{(+)}{INF},\ \underset{(+)}{POP}) \quad \ldots (2)$$

Where,
EXR = Exchange Rate (%),
OPN = Degree of Openness (Imports + Exports/GDP) (%)
MS = Growth Rate of Real Broad Money supply (M_2) (%),
INTR = Interest Rate (prime lending rate) (%)
TGE = Growth Rate of Total Government Expenditure (%),
INF = Inflation Rate (%),
GDP = Growth Rate of Real Gross Domestic Output (%),

POP= Population Growth Rate (%)

3.2.1. Apriori Expectations

The signs in the parenthesis represent apriori expectations of each of the variables used in this study.

3.3. Analytical Techniques

The analytical techniques employed for the purpose of this study are based on the specific objectives of the study.

3.3.1. Objective 1

To investigate the existence of a long run relationship between exchange rate fluctuations and economic growth in Nigeria, the Cointegration and the Error Correction Model techniques were employed.

3.3.1.1. Cointegration

The Johansen test of Cointegration was used to determine whether there exists a long run relationship between exchange rate variations and economic growth. Cointegration means that while many developments can cause permanent changes in the individual variable, there is some long run equilibrium relationship tying the individual variables together represented by some linear combinations of them. There is an assumption of non-stationarity between exchange rate and economic growth.

$GDP = B_0 + B_1 EXR + E_t \sim I(1)$ ..... (3)

Equation 4 shows the non-stationarity nature of both variables. E_t has zero mean, therefore $E_t \sim I(0)$, but it can cause serial correlation through heteroscedasticity. The Johansen cointegration test approaches the test by examining the number of independent linear combination (k) for an (M) time series variable set that yield a stationary process.

$P = m - k$ ..... (4)

Where, p represents the number of common non – stationary underlying processes. M= number of time series variables set that yields stationary process. K= the number of independent linear combinations. The decision criteria is that if k=0, p=0 then the time series are not integrated. If 0<k<m, 0<p<m; then the time series variable are stationary I(0). This will help to achieve the second specific objective of this study. The test of cointegration will be carried out based on Equation (2).

3.3.1.2. Error Correction Model

The error correction model directly estimates the speed at which a dependent variable returns to equilibrium after a change in other variables. The ECM in this study for the output model specified in Equation 8 is formulated thus:

$$\Delta LnRGDP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 \Delta LnEXR_t + \sum_{i=1}^{n} \alpha_2 \Delta LnOPN_t + \sum_{i=1}^{n} \alpha_3 \Delta Ln\ MS_t + \sum_{i=1}^{n} \alpha_4 \Delta Ln\ INTR_t + \sum_{i=1}^{n} \alpha_5 \Delta LnTGE_t + \sum_{i=1}^{n} \alpha_6 \Delta LnINF_t + \sum_{i=1}^{n} \alpha_7 \Delta Ln\ POP_t + \alpha_8 ECM_{t-1} + \Sigma_t \quad (5)$$

Where:

- Δ is the first difference operator
- ECM_{t-1} is the over- period lagged value of the residual (error term)
- a_8 is the error correction coefficient or the empirical estimate of the equilibrium error term.
- and the remaining variables are as defined in equation (2).

3.3.2. Objective 2

To determine the nature of the causal relationships between exchange rate volatility and economic growth in Nigeria, the Granger causality test was employed.

3.3.2.1. Granger Causality Test

The Granger causality equations for the purpose of this study are specified thus:

$$RGDP_t = \sum_{i=1}^{n} \alpha_i EXR_{t-1} + \sum_{j=1}^{n} B_j RGDP_{t-1} U_{it} \quad (6)$$

$$EXR_t = \sum_{i=1}^{n} \alpha_i EXR_{t-1} + \sum_{j=1}^{n} B_j RGDP_{t-1} U_{it} \quad (7)$$

The $RGDP_t$ is affected by the past values of EXR and RGDP. EXR is affected by past values of RGDP and EXR. The test is conducted by regressing the current RGDP on all lagged value of RGDP but not EXR because it is being tested for causation. By this, we will obtain the RSS_r. Afterwards, we regress the current RGDP on its past value and the lagged values of EXR, to obtain the unrestricted residual sum of squares. The decision rule is that if $\alpha_i = 0$, then EXR_{t-1} does not granger

cause changes in $RGDP_t$. if $\delta_j=0$ then $RGDP_{t-1}$ does not granger cause changes in EXR_t. Thereafter, the F-test is being applied. $(RSS_r - RSS_{ur})/m * N - K/RSS_{ur}$. Where M represents the number of lagged terms. If $F_{comp} > F_{tab}$ at a chosen significant level, then the lagged values of the EXR_t causes changes in $RGDP_t$. To determine m, we use the AIC or SIC = $n^{k/n}Eu^2/n = n^{k/n}$ RSS/n. This technique will be used to achieve the third specific objective of this study.

4. Presentation of Empirical Results and Discussions

This section analyses and discusses the empirical results of this study.

4.1. Unit Root Tests

We begin this analysis by examining the time properties of the data. This is done in order to avoid spurious regression. The orders of integration of the variables are examined using the Augmented Dickey-Fuller (ADF) and the Phillip-Perron (PP) test statistics. The results of these tests are presented in presented in tables 1 and table 2.

The result of the unit root test for both the Augmented Dickey fuller test and the Phillip Perron test shows that all the variables used in this study are stationary at various levels of integration as shown in Tables 1 and 2. This expression satisfies our choice of carrying out the Johansen test of cointegration.

Variable	ϖ ADF	1% critical value (**)	5% critical value (*)	Order of integration
EXR	-5.716**	-3.585	-2.928	1(1)
RGDP	-5.881**	-3.581	-2.926	1(0)
MS	-4.391*	-3.585	-2.929	1(1)
INF	-3.980**	-3.581	-2.926	1(0)
INTR	-10.558**	-3.585	-2.928	1(1)
OPN	-8.466**	-3.585	-2.928	1(1)
POP	-5.815*	-3.588	-2.929	1(1)
TGE	-7.663**	-3.585	-2.928	1(1)

Table 1: Result of Unit Root Test Based on Augmented Dickey Fuller (ADF)
Source: Authors' computation using (EVIEWS 9)

Variable	PP Adjusted Stat	1% Critical Value (**)	5% Critical Value (*)	Order of integration
EXR	5.715**	-3.584	-2.928	1(1)
RGDP	-6.421**	-3.588	-2.929	1(0)
MS	-4.377**	-3.588	-2.929	1(1)
INF	-3.942**	-3.581	-2.926	1(0)
INTR	-10.619**	-3.584	-2.928	1(1)
OPN	-8.435**	-3.584	-2.928	1(1)
POP	-5.815*	-3.588	-2.929	1(1)
TGE	-7.592**	-3.585	-2.928	1(1)

Table 2: Result of Unit Root Test Based On Phillip Perron (PP)
Source: Authors' computation using (EVIEWS 9)

4.2. Cointegration Results

To investigate the long run relationship between exchange rate and economic growth in Nigeria, the Johansen Co-integration technique was employed.

Hypothesized		Trace	0.05
No. of CE(s)	Eigenvalue	Statistic	Critical Value
None *	0.749085	239.2635	159.5297
At most 1 *	0.695401	178.4273	125.6154
At most 2 *	0.604571	126.1219	95.75366
At most 3 *	0.473569	85.29950	69.81889
At most 4 *	0.428397	57.06755	47.85613
At most 5 *	0.290914	32.45788	29.79707
At most 6 *	0.234343	17.33166	15.49471
At most 7 *	0.119160	5.582713	3.841466

Table 3: Unrestricted Cointegration Rank Test (Trace)
Trace test indicates 8 cointegrating eqn(s) at the 0.05 level
** Denotes Rejection of the Hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Hypothesized		Max-Eigen	0.05
No. of CE(s)	Eigenvalue	Statistic	Critical Value
None *	0.749085	60.83621	52.36261
At most 1 *	0.695401	52.30533	46.23142
At most 2 *	0.604571	40.82245	40.07757
At most 3	0.473569	28.23194	33.87687
At most 4	0.428397	24.60967	27.58434
At most 5	0.290914	15.12622	21.13162
At most 6	0.234343	11.74895	14.26460
At most 7 *	0.119160	5.582713	3.841466

Table 4: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)
Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

The results of the trace test indicate that at 5%significance level, there are eight cointegrating factors. Also, the max- eigen test indicates three cointegrating equations at 5% significance level among the variables. Therefore, there is an existence of a long run relationship between exchange rate volatility and output in Nigeria. Hence, the need to estimate the Error Correction Mechanism (ECM).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.609863	0.574854	8.019188	0.0000
EXR	0.222361	0.068955	-3.224738	0.0026**
INF	0.170040	0.001722	1.010359	0.3186
INTR	0.018449	0.007073	2.608498	0.0128*
MS	0.686066	0.080859	8.484694	0.0000***
TGE	0.452783	0.113915	3.974744	0.0003***
OPN	0.320029	0.005825	0.554286	0.5825
POP	-1.083877	0.220095	-4.924585	0.0000***

Table 5: Co integrating Regression of Exchange Rate Volatility and Economic growth
Source: Authors' computation using (EVIEWS 9)

R-squared	0.996941	Mean dependent var	7.284627
Adjusted R-squared	0.996392	S.D. dependent var	3.055119
F-Statistics	1815.823	Durbin- Waston	1.865285
	Prob(F-statistic)	0.000000	

The co-integrating regression was estimated based on equation (2). The co-integrating regression result is presented in Table 5. The R^2 of the co-integrating regression shows that about 99% of the total variations in RGDP is explained by the specified explanatory variables. The F- statistics of 1815.823 is significant indicating that at 1% probability level which shows that the R^2 is significant and the model has goodness of fit. Also, EXR, MS, TGE and POP are significant at 1% probability level respectively. The coefficient of exchange rate indicates a 22% positive relationship, the coefficient of interest rate shows a 0.01% positive relationship, the coefficient of inflation shows 17% positive relationship, TGE expresses 45% positive relationship, money supply shows 68% positive relationship, POP shows 1.08 inverse relationship, OPN indicates 32% direct relationship with RGDP. Furthermore, the Durbin-Watson Statistics shows noabsence of serial correlation in the residuals of the estimated model.

4.3. Error Correction Model (ECM) Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.204332	0.592327	7.097995	0.0000
EXR	-0.115540	0.060053	-0.192394	0.8485
INF	0.231329	0.001779	0.746808	0.4598
INTR	0.213096	0.007087	3.018964	0.0045**
MS	0.949941	0.035241	26.95531	0.0000***
TGE	0.380972	0.105137	3.623589	0.0009***
OPN	0.223200	0.006053	0.368743	0.7144
POP	-0.849650	0.220100	-3.860289	0.0004***
ECM(-1)	-0.483139	0.170519	2.833341	0.0073**
R-squared	0.996625	Mean dependent var		7.401798
Adjusted R-squared	0.996003	S.D. dependent var		2.980195
S.E. of regression	0.188418	Akaike info criterion		-0.343533
Sum squared resid	1.349056	Schwarz criterion		-0.025509
Log likelihood	15.90127	Hannan-Quinn criter.		-0.224399
F-statistic	1602.836	Durbin-Watson stat		1.806407
Prob(F-statistic)	0.000000			

Table 6: Over Parametised ECM Result of Exchange Rate Volatility and Economic Growth
Source: Authors' Computation Using (EVIEWS 9)

The Error Correction Mechanism was estimated based on equation (5). The ECM result is presented in Table 6. The R^2 value of the Over parameterised ECM model shows that about 99% of the total variations in GDP is explained by the specified explanatory variables. The F- statistics of 1602.8 is significant at 1% probability level indicating that R^2 is significant and the model has goodness of fit. Furthermore, some of the coefficients of the explanatory variables are significant INTR, MS, TGE, and POP, exception of EXR, INF and OPN. Therefore we carry out parsimonious.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.718822	0.527787	8.940769	0.0000
EXR	-0.150150	0.063238	-2.374353	0.0226*
INTR	0.017281	0.005710	3.026489	0.0044**
MS	0.715349	0.071991	9.936701	0.0000***
POP	-1.078528	0.199572	-5.404217	0.0000***
TGE	0.370379	0.104037	3.560059	0.0010**
ECM(-1)	-0.421266	0.144243	-2.920540	0.0058**
R-squared	0.997425	Mean dependent var		7.401798
Adjusted R-squared	0.997029	S.D. dependent var		2.980195
S.E. of regression	0.162454	Akaike info criterion		-0.657572
Sum squared resid	1.029265	Schwarz criterion		-0.379300
Log likelihood	22.12414	Hannan-Quinn criter.		-0.553329
F-statistic	2517.492	Durbin-Watson stat		1.899118
Prob(F-statistic)	0.000000			

Table 7: Parsimonious ECM Result of Exchange Rate Volatility and Economic Growth
Source: Authors' computation using (EVIEWS 9)

The Error Correction Mechanism was estimated based on equation (5). The Parsimonious ECM result is presented in Table 7. The result reveals a well- defined error correction term, ECM which is negative and statistically significant at 1% probability level. The R^2 value of the ECM model shows that about 99% of the total variations in GDP is explained by the specified explanatory variables. The F- statistics of 1602.8 is significant at 1% probability level indicating that R^2 is significant and the model has goodness of fit. Furthermore, all of the coefficients of the explanatory variables are significant. The Durbin- waston value of 1.8 indicates the absence of serial correlation implying that there is no serial correlation between the error terms (u_i).

4.4. Granger Causality Results

To Determine the Nature of the Causal Relationships between Exchange Rate volatility and economic growth in Nigeria, the Granger Causality Test was employed.

Null Hypothesis	Obs	F-Statistic	Prob.
EXR does not Granger Cause RGDP	44	0.02557	0.9748
RGDP does not Granger Cause EXR		2.07781	0.1388

Table 8: Causality Test of Exchange Rate and RGDP
Source: Authors' computation using (EVIEWS 9)

From the Granger results, we accept the null hypothesis that exchange rate(ER) does not Granger cause RGDP. This is because computed F- statistic value is not significant. Similarly, we accept the null hypothesis that RGDP does not granger because exchange rate(ER). Thus, there is no causality between RGDP and ER.

4.5. Policy Implications of Findings

The trace test showed eight cointegrating equation existing among the variables at 5% level of significance. Also, the max- eigen test revealed three co-integrating equations at 5% significance level among the variables, we reject the null hypothesis. This implies that there exists a long run relationship between EXR, INTR, MS, INF, POP, TGE and OPN. The result of the co-integrating regression of exchange rate and Economic Growth showed that there is 99% impact of exchange rate on economic growth in Nigeria. The coefficient of exchange rate indicates a 0.22% positive relationship, the coefficient of inflation shows a 0.17% positive relationship, the coefficient of interest rate shows 0.01% positive relationship, MS expresses 0.68% positive relationship, OPN indicates 0.32% positive relationship, TGE shows 0.45% positive relationship, POP indicates 1.0% inverse relationship with economic growth.

The findings of the study showed that there is co-integrating relationship between currency fluctuations and economic growth in Nigeria in the long run. The result of the co-integration test showed that there exist a long run relationship between exchange rate volatility and growth. This implies that exchange rate can be used as a policy instrument to enhance the level of output. However, government should promote and strengthen other macroeconomic variables. Therefore, there should be a drive toward domestication of the country's resources through inward looking policy, which will encourage the local utilisation of the country abundant resources and also diversification of the country's exports base. The country should develop linkages between the primary commodities and its industrialization in order to reduce over- reliance on the international market.

The Parsimonious ECM result reveals a well- defined error correction term, the coefficient of ECM (-0.483) is negative and significant at 1% level. This implies that whenever there is a displacement in the level of GDP, it will take approximately two years for the displacement to be corrected. The R^2 value of the ECM model shows that about 99% of the total variations in RGDP is explained by the specified explanatory variables. The F- statistics of 2517.492 is significant at 1% probability level indicating that R^2 is significant and the model has goodness of fit. Specifically, the coefficient of EXR shows 15% inverse relationship, INTR indicates 0.01% positive relationship, MS shows 71% positive relationship, TGE shows 37% positive relationship and POP shows 1.07% inverse relationship with economic growth. Also, all the variables are statistically significant at 5%, 1%, 1%, 1%, and 1% respectively. The Durbin- waston value of 1.8 indicates the absence of serial correlation implying that there is no serial correlation between the error terms (u_i).

However, the granger causality test reveals that there is no causality between exchange rate and economic growth in Nigeria. Exchange rate does not granger cause the movements in RGDP. Hence, we accept the null hypothesis.

5. Summary, Policy Recommendations and Conclusion

This study examined the effect of exchange rate fluctuations on economic growth in Nigeria using annual data for the period 1970-2016. Specifically, the study sought to investigate the existence of a longrun relationship between exchange rate and economic growth in Nigeria; and determine the nature of the causal relationship between exchange rate and economic growth in Nigeria. The study employed the Johansen test of Co-integration, Error Correction Model, and the Granger Causality test to address the specific objectives. The study revealed that: there exists a long run relationship between exchange rate and economic growth in Nigeria. Furthermore, the Error Correction Mechanism (ECM) result revealed that it takes approximately two years for the disequilibrium in the long run trend of GDP to be corrected back to the equilibrium level. The Granger Causality test revealed that there is no causality between economic growth and exchange rate in Nigeria.

The study therefore recommends, amongst others, policies that will not only ensure a realistic and stable exchange rate but will also encourage local production to boost national output.The Government and relevant monetary authorities should adopt a suitable exchange rate policy that will allow for a realistic and stable exchange rate to enhance output performance.

However, there is need for researchers in related disciplines to further investigate on the sectoral impact of exchange rate fluctuations on output performance in Nigeria. Indeed, a disaggregated analysis of the impact of exchange rate fluctuations on national output is quite necessary.

This study has revealed the critical role that exchange rate plays in a country's economy given its long run relationship with output. However, in view of the fact that other factors other than exchange rate movements have important implications for output performance in Nigeria, it is absolutely imperative that government formulate and implement an appropriate mix of fiscal and monetary policies that will not only ensure a realistic and stable exchange rate but will also guarantee a rate that encourages local production and boosts national output.

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