EXCHANGE RATE DYNAMICS AND ECONOMIC PERFORMANCE: EVIDENCE FROM NIGERIA

Lawrence Uchenna OKOYE[1]*, Uchechukwu E, OKORIE[2], Johnson I. OKOH[3], Felicia O. OLOKOYO[4], Felix N. EZEJI[5]

[1]Dr., Covenant University Ota, Nigeria, lawrence.okoye@covenantuniversty.edu.ng
[2]Mr., Covenant University Ota, Nigeria, uchechukwu.okorie@covenantuniversty.edu.ng
[3]Dr., National Open University of Nigeria, okohjohnson1@gmail.com
[4]Dr. Covenant University Ota, Nigeria, felicia.olokoyo@covenantuniversity.edu.ng
[5]Mr., Ebonyi State University, Abakaliki, Nigeria, felixezeji67@gmail.com
*Corresponding Author

Abstract

The paper examined the nexus between exchange rate policy and economic performance in Nigeria to determine growth-supportive policy option for a developing economy. Exchange rate effect on growth was analyzed under two distinct phases of exchange rate management: fixed (1970-1986) and floating (1987-2016) regimes. The full impact assessment of exchange rate on economic growth was also examined for the entire period (1970-2016). Using the generalized autoregressive conditional heteroskedasticity (GARCH) model, the mean equation shows significant positive effect of exchange rate on growth over the full sample period and under the floating regime. Exchange rate effect on growth during the fixed regime was negative and non-significant. In terms of volatility, the study did not show significant evidence of exchange rate volatility over the full sample period and under the fixed regime. However, under the floating regime, there is evidence of strong negative volatility effect of exchange rate on economic growth. Based on the above findings, the study concludes that exchange rate policy is a major determinant of economic performance in Nigeria. The study therefore recommends that for developing economies that rely on manufactured and industrial goods imports, exchange rate management should follow a gradual transition process from the fixed to the floating exchange rate policy so as to smoothen the transition-induced shocks. In other words, as these nations develop and maintain a robust domestic production capacity, they should gradually liberalize their economic policies, including exchange rate in order to optimize the benefits of stable exchange rate.

Keywords: Exchange rate policy; Economic performance; Exchange rate volatility

1 INTRODUCTION

Owing to differences in resource endowments, nations specialize in the production of goods and services for which they have relative comparative advantage. For reasons that include availability of raw materials, technical competence, institutional capacity and industrial infrastructure, developing economies are characterized by the production of primary products as opposed to secondary production that characterize

developed economies. Primary products are essentially raw materials composed of agricultural products and mineral resources with very little or no value addition. These products are exported as raw materials for foreign industries and with the proceeds, manufactured and industrial goods are imported to satisfy local requirements. Hence, trade is an integral part of modern economies. For ease of cross border transactions, foreign exchange is required as a medium or facilitator of exchange transactions.

Following the attainment of political independence, Nigeria had the immediate challenge of transiting from a commodity-based to an industrial economy. To achieve this lofty objective, an avalanche of foreign exchange management strategies has been introduced. These measures cut across fixed and floating exchange rate regimes and their variants. However, in spite of the multiplicity of foreign exchange policies adopted by the authorities, attainment of an efficient foreign exchange management system remains a major challenge to economic growth and development in Nigeria due, largely, to heavy dependence on commodity exports and industrial and manufactured goods imports (Okafor, 2011).

From 1960 to mid-1986, Nigeria adopted the fixed exchange rate policy, characterized by currency overvaluation, ostensibly to fast-track the process of industrialization through cheap imports of industrial equipment, raw materials, spare-parts and technical support (Obadan, 2006). Overvaluation rendered imports cheaper while exports became more expensive. The deliverables for the Nigerian economy were quite high. For instance, while it was cheap to import industrial and consumer goods, the proceeds from the export of agro-products and mineral resources were quite high. The economy recorded appreciable growth rates, stable exchange rate, as well as stable and moderate inflation rates for a good part of the period. The outcome supports the argument in Rogoff, Husain, Mody, Brooks, and Oomes (2013) that at the early stage of a nation's financial development and integration, fixed exchange rate policy tends to offer anti-inflationary benefits without compromising growth. However, it also created unsustainable consumption patterns for the country. Specifically, the liquidity surfeit arising from massive influx of petro-dollar became an impediment to enterprise as domestic consumption relied heavily on importation, leading to massive outflow of foreign exchange with adverse implications for macroeconomic stability.

With the introduction of the structural adjustment programme (SAP) in July 1986, the Nigerian economy was restructured to eliminate price distortions associated with the fixed regime, promote competition and diversify the productive base of the economy (Central Bank of Nigeria, 1995). A major component of SAP was deregulation of the mechanism for determination and management of exchange rate of the domestic currency. This marked a policy shift from fixed to a market-based exchange rate regime. Transition to liberalized exchange rate policy produced ripple effects on the Nigerian economy, some of which were unintended. For instance, the reform led to massive devaluation of the domestic currency which reflected in high and unstable exchange rate, with attendant shocks to economic performance. Though it is argued that the rapid economic transformation of China derived from its adoption of currency devaluation as a deliberate strategy for boosting domestic production (Sanger and Wine, 2010), currency devaluation produced the opposite result in Nigeria. According to the Federal Government of Nigeria (1989), adoption of the floating exchange rate policy led to generalized increases in prices due to the high import content of local manufacturing. This led to massive outflows of financial resources in the form of import bills and, in some cases, outright capital flight which are potential threats to economic growth.

Literature on financial economics is replete with empirical evidence on the link between exchange rate and output growth in both developing and developed economies. However, some scholars have examined this link without regard to any particular policy (see, Mordi, 2006; Olokoyo, 2012). Recent studies on the subject have focused on floating exchange rate regime due to increasing imperative for economic reforms in recent times. Such studies include Anyanwu, Ananwude, and Okoye (2017), Okoronta and Odoemena (2016), Ugwu and Onwuka (2016), etc. The work of Okoye, Evbuomwan, Ezeji and Erin (2018) focused on the nexus between exchange rate policy and economic development. Comparative studies on foreign exchange rate policies (see, Obi, Oniore, and Nnadi, 2016) aimed at identifying growth-enhancing option, particularly in developing economies, are quite few. Such studies are deemed necessary to assist policy makers, particularly, in developing nations in decisions relating to the choice of exchange rate policy that better suits the demands of their economies at a point in time.

Against the above background, this study examined the effect of exchange rate policy on economic growth in Nigeria over the period 1970-2016 to ascertain whether observed trend in output growth is the result of exchange rate policy adopted. Exchange rate management in Nigeria was disaggregated into two distinct phases (fixed and floating regimes). To complement the outcome of our investigation, the full impact assessment of exchange rate on economic growth was also examined for the entire period**.** Since policy shift to a floating regime was only an aspect of the package of financial sector reform introduced under the

structural adjustment programme (SAP), other variables like interest rate, inflation rate and external debt were also introduced as explanatory variables.

2 REVIEW OF RELATED LITERATURE

Financial economic literature shows dearth of empirical evidence on the nexus between exchange rate regime and economic growth. Findings of available studies in this area are rather not consistent. For instance, Kidane (1996) examined the link between exchange rate policy and economic reform in Ethiopia. The result showed that devaluation of the Ethiopian currency increased the supply of Ethiopia's principal commodity (coffee). This result suggests evidence of a positive impact on output growth. Edwards and Levy-Yeyati (2003) conducted an impact assessment of terms of trade on GDP growth under different exchange rate regimes to determine evidence of asymmetric effect of positive and negative terms of trade shocks on growth as well as discern the nexus between output response and exchange rate regime. Evidence from the study indicated that (i) distortions or shocks in terms of trade are more amplified in countries with fixed exchange rate regime (ii) output response is larger for negative shocks than for positive shocks (iii) there is faster growth in countries with more flexible exchange rate regime than in countries with more rigid regime.

Lohi (2014) examined whether CFA countries with fixed exchange rate policy enjoy lower inflation relative to other non-CFA Sub-Saharan African (SSA) countries in general, and relative to non-CFA countries with fixed exchange rate policy. The study not only confirmed low inflation effect of fixed exchange rate regime in CFA countries, it also showed that these countries suffer output losses (and hence reduced welfare) relative to all non-CFA SSA countries in general, and in particular, relative to those with fixed exchange rate policy partly because of their membership of the CFA franc currency union and partly because of their alignment to the fixed regime.

In a similar study, Mohanty and Bhanumurthy (2014) examined the nexus between exchange rate regimes and inflation in India to determine whether low inflation rate in India was the result of transition from relatively fixed to a managed float regime. The study showed no association between inflation and exchange rate regime. The result was justified on the ground that the success of Reserve Bank of India's intervention to control money growth did offset the impact of exchange rate volatility. Though Lohi (2014) and Mohanty and Bhanumurthy (2014) did not directly explain the response of growth to exchange rate regimes, they provide insight on possible effect of inflation on growth under different exchange rate regimes.

Mireille (2007) studied the impact of real exchange rate on the external competitiveness of Benin's manufacturing exports by analyzing its exchange rate policy. The result showed that non-competitiveness of Benin's manufactured exports lie more with over-valuation (a feature of fixed exchange rate regime) than with under-valuation of its currency. Amin (1996) studied how exchange rate regime affects the competitiveness of the agricultural sector in Cameroon. The study showed that over-valuation of the country's currency had significant negative effect on Cameroon's agricultural competitiveness. On the other hand, Mbaye (2012) examined the link between currency devaluation and economic growth to determine if devaluation of a nation's currency can affect growth through productivity. The study utilized panel data from 72 countries over the period 1970-2008. The study showed strong support for growth-enhancing effect of productivity improvements. The results suggest a negative link between exchange rate over-valuation and economic growth or a positive link between devaluation and growth.

Obi, Oniore and Nnadi (2016) investigated the link between exchange rate regimes and economic growth in order to determine the impact of various regimes on the growth of the Nigerian economy. Data for the period 1970-2014 were analyzed using the generalized method of moments (GMM). The result showed non-significant negative impact of exchange rate on economic growth over the entire review period. For the fixed exchange rate policy, the study showed that exchange rate has significant negative effect of on growth while for the floating rate regime, the study presented evidence of non-significant positive impact of exchange rate on output growth.

Mordi (2006) examined the challenges of exchange rate volatility in economic management in Nigeria. The study analyzed Nigeria's exchange rate movement for the period 1970-2005 using the generalized autoregressive conditional heteroskedasticity (GARCH). The result showed causal relationships between exchange rate movements, inflation, fiscal deficits, and economic growth. With regard to volatility, the study produced evidence of exchange rate volatility between 1992 and 2005. Though the study was not disaggregated into exchange rate regimes, it produced a trend that showed relative stability under the fixed regime and volatility under the floating regime.

Abimbola and Olusegun (2017) analyzed the exchange rate volatility, stock market performance and aggregate output nexus in Nigeria using the GARCH and causality techniques. The study focused on the

floating exchange rate period (1985-2015). Evidence from the study showed significant positive impact of exchange rate and stock price volatilities on output performance. The causality estimates confirmed causal impact of exchange rate volatility on stock price movement and aggregate output and vice versa.

In a study on foreign direct investment (FDI) and output growth in Nigeria, Olokoyo (2012) examined the extent to which exchange rate accounts for variations in GDP growth during the 1970 to 2007 period. Model estimation was based on the technique of ordinary least squares (OLS). The study showed non-significant impact of exchange rate on economic growth. Also using the ordinary and generalized least squares (OLS and GLS) estimation techniques, Okoye, Modebe, Erin, and Evbuomwan (2017) examined the effect of external debt, exchange rate, and inflation on economic growth in Nigeria over the period 1981-2015. The results for both the OLS and GLS showed significant statistical support for growth-enhancing impact of external debt, exchange rate and inflation rate on economic growth. However, these studies did not relate to any particular regime.

Recent studies on exchange rate-growth nexus largely focus on the floating regime. This may derive from the increasing global trend towards economic liberalization. For instance, Anyanwu, Ananwude and Okoye (2017) studied the causal link between exchange rate and GDP growth in Nigeria. The research focused on the reformed or floating exchange rate regime (1986-2015). It showed uni-directional causal impact from exchange rate to GDP and from exchange rate to manufacturing capacity utilization. Okorontah and Odoemena (2016) examined the effect of exchange rate fluctuations on economic growth in Nigeria using the error correction model (ECM) over the period 1986-2012. The study showed non-significant effect of exchange rate on economic growth. However, in a related study, Maduabuchi and Ajudua (2014) presented significant negative impact of exchange rate on manufacturing GDP in Nigeria.

Branson and Love (1998) examined the link between exchange rate variation and manufacturing employment in the USA. Evidence from the study showed negative impact of exchange rate changes on manufacturing employment. The result of this study aligned with Frenkel (2004) which also showed significant negative effect of exchange rate fluctuations on manufacturing employment in Argentina, Brazil, Chile and Mexico. However, studies by Ngandu (2008) and Adedokun (2012) reported positive effect of exchange rate variations on manufacturing employment for South Africa and Nigeria respectively. Based on data for 1995-2005, Berman, Martin and Mayer (2012) showed that firms respond to exchange rate depreciation by raising output price and reducing the scale of operations, leading to loss employment. Low manufacturing employment translates to reduced manufacturing capacity utilization and lower output growth.

From the above review, it is clear that though scholars have provided empirical evidence on the link between exchange rate and economic growth, only a few of the studies focused on exchange rate regime-economic growth nexus. In Nigeria, for instance, only Obi, Oniore, and Nnadi (2016), to the best of our knowledge, explored the link between these variables but did not examine volatility-inducing impact of exchange rate regime. This is the focus of this research.

3 METHODOLOGY

The study adopted the quantitative research technique based on *ex-post facto* design. Time series data for the period 1970-2016 were analyzed using the method of generalized autoregressive conditional heteroskedasticity (GARCH). Exchange rate dynamics was treated in the study within the context of fixed and floating regimes. Based on the adopted classification, data was analyzed, first for the full sample (1970-2016) and then decomposed into fixed (1970-1986) and floating (1987-2016) regimes.

GARCH method is best suited for volatility studies and was used by Subair and Salihu (2010) and Milambo, Maredza and Sibwa (2013) to evaluate the effect of exchange rate volatility on the Nigerian and South African stock markets respectively. It was also adopted in Abimbola and Olusegun (2017) to evaluate the nexus between exchange rate volatility, stock market performance and aggregate output in Nigeria. It was also adopted by Mordi (2006) to establish the behaviour of exchange rate in Nigeria.

3.1 Model Specification

The study adopted the modified form of the model in Obi, Oniore and Nnadi (2016). The model which assumes a linear relationship between exchange rate and economic growth is stated below:

$$LnRGDP = \beta_0 + \beta_1 LnREXR + \beta_2 LnM2 + \beta_3 LnFGE + \beta_4 DOP + Ut \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where:

RGDP = Real GDP; REXR = Real exchange rate; M2 = Broad money supply; DOP = Degree of openness;

Ln = Natural logarithm; B_0 = Intercept; B_1 ….. B_4 = Parameters to be estimated; Ut = Error term

The modified version of equation 1 employed in this study is specified as follows:

$LGDP = \beta_0 + L\beta_1 EXR + L\beta_2 EXD + L\beta_3 INF + L\beta_4 IR + \varepsilon it$ ……. (2)

Where:

LGDP = Log of Gross Domestic Product; LEXR = Log of Nominal exchange rate; LEXD = Log of External debt stock; LINF = Log of Inflation rate; LIR = Log of Interest rate; β_0 = Intercept; β_0 **…..** β_4 **=** Parameters to be estimated; ε_{it} = Stochastic variable or error term.

4 PRESENTATIONS AND DISCUSSION OF RESULTS

Data on the variables were analyzed in line with the objectives of the study. The results of the various tests are presented and discussed in this section.

4.1 Unit Root Test

Table 1 shows the result of unit root test conducted to ascertain time series properties of the data. Evidence of unit root was examined with Augmented Dickey Fuller (ADF) test at level and first difference. The result shows stationary trends for LGDP and LINF at levels and LEXR, LEXD, and LIR at first difference. Hence, all the variables became stationary at their first difference.

Table1: Unit Root Result

Variable	Phillip Perron (PP) @ 5% Levels	First Difference	Remark
LGDP	-5.725501 (-2.943427)***	-4.303562 (-2.931404) ***	Integrated to order 0
LEXR	2.270614 (-2.929734)	-3.430587 (-2.933158)**	Integrated to order 1
LEXD	-1.861150 (-2.929734)	-4.970621 (-2.931404)***	Integrated to order 1
LINF	-4.045236 (-2.926622)***	-7.095455 (-2.929734)***	Integrated to order 0
LIR	-2.013410 (-2.926622)	-7.278151 (-2.929734)***	Integrated to order 1

Notes: Number of lags was determined by AIC, ***, **, denotes level of significance at 1 per cent and 5 per cent.

4.2 Co-integration Test

The study utilized Johansen and Juselius maximum likelihood estimation method (shown in table 2) to determine evidence of long-run association among the series. The result shows a hypothesized number of co-integrated equations at 0 and 4. The existence of a co-integrated series implies a long-run relationship between economic growth and the exogenous variables in the model.

Table 2: Co-integration Result

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.596861	84.41257	69.81889	0.0022
At most 1	0.408189	45.34822	47.85613	0.0844
At most 2	0.236562	22.79180	29.79707	0.2564
At most 3	0.152105	11.18509	15.49471	0.2004
At most 4 *	0.090736	4.090131	3.841466	0.0431

4.3 Test for Volatility

4.3.1 GARCH Result for the Full Sample Period (1970-2016)

Table 3 shows the result for the full sample period (1970-2016). The result of the mean equation (upper

segment of table 3) indicates significant positive effect of exchange rate on economic growth at 1 per cent. Exchange rate coefficient of 1.043649 implies that a percentage change in exchange leads to about 1.044 per cent change in economic growth. This result suggests that exchange rate depreciation enhanced export thereby promoting output growth. The result also indicates that external debt has a direct or positive effect on economic growth over the sample period, though its effect only became significant at approximately 8.5 per cent. This indicates that a percentage change in external debt produces 0.31 percentage change in growth. The result implies that more external debt procurement stimulates the growth capacity of the economy. Further findings from the study indicate that inflation rate and interest rate show significant negative effect on economic growth at 5 per cent. This implies that 1 per cent change in inflation rate brings about 0.092 per cent change in economic growth, an indication that inflation rate in Nigeria is an impediment to growth. For interest rate, the result indicates that a percentage increase in interest rate leads to about 1.455 per cent decline in economic growth, holding other variables constant. The result implies that high interest rate stifles growth. The R-squared value indicates that 98.4 per cent of variations in economic growth is jointly explained by the changes in exchange rate, external debt, inflation rate and interest rate. The Durbin Watson result (1.76) reveals absence of serial correlation in the model.

The result of the conditional variance model presented in the lower segment of table 3 indicates non-significant positive exchange rate shocks on growth. This implies non-significant volatility effect (γ_1) of exchange rate (p-value>0.05) on economic growth. Also, the model does not show significant effect of conditional exchange rate variance on economic growth. Specifically, the lagged forecast variance of exchange rate reveals non-significant positive association with economic growth. Overall, the study shows that net positive exchange rate shocks have non-significant negative impact on Nigerian output growth during the period 1970-2016.

Table 3: GARCH Result (1970-2016)

Dependent variable: LGDP

Method: GARCH

Mean Equation			
Variable	Coefficient	z-Statistic	Prob.
LOG(GARCH)	0.001922	0.009439	0.9925
LEXR	1.043649	2.946244	0.0032
LEXD	0.314331	1.723752	0.0848
LINF	-0.091540	-2.101968	0.0356
LIR	-1.454655	-1.974012	0.0484
C	7.646135	3.070999	0.0021
AR(1)	0.815253	4.171524	0.0000
Variance Equation			
C	0.429265	0.701328	0.4831
α_1	-0.421575	-0.723140	0.4696
γ_1	0.475573	0.520570	0.6027
LEXR	-0.059803	-0.647564	0.5173
R-Squared	0.983975		
Durbin Watson	1.757358		

Source; Authors' computation, 2018

4.3.2 GARCH Result for the Fixed Regime (1970-1986)

For the fixed exchange rate regime (1970-1986) (presented in table 4), the estimated coefficient for the mean equation indicates that a percentage increase in exchange rate leads to 0.88 percentage reduction in growth though it is not significant at 5 per cent. External debt, however, shows significant positive effect on economic growth. A percentage rise in external debt raises the rate of economic growth by 0.85 per cent. The effect of inflation on growth during the fixed exchange rate period was also positive but not significant. For interest rate, the study shows significant negative effect on economic growth. A percentage reduction in

interest rate leads to about 1.28 per cent increase in economic growth.

Analysis of the variance equation shows that shock to exchange rate volatility is positive but non-significant. This implies that exchange rate was relatively stable (fluctuations, if any, were within normal margins provided by the exchange rate management mechanism) during the period. The result further indicates that transmission of positive exchange rate shocks does not have important positive impact on growth during the fixed regime.

Table 4: GARCH Result (1970-1986)

Dependent variable: LGDP

Method: GARCH

Mean Equation			
Variable	Coefficient	z-Statistic	Prob.
LOG(GARCH)	0.025637	0.083481	0.9335
LEXR	-0.876212	-0.631173	0.5279
LEXD	0.853510	6.200257	0.0000
LINF	0.229598	0.735646	0.4619
LIR	-1.282049	-4.191010	0.0000
C	5.573169	164.9533	0.0000
Variance Equation			
C	0.068709	0.464239	0.6425
α_1	-0.312075	-0.494244	0.6211
γ_1	0.674137	0.315652	0.7523
LEXR	0.045968	0.224218	0.8226
R-Squared	0.943443		
Durbin Watson	1.625737		

Source; Authors' computation, 2018

4.3.3 GARCH Result for the Floating Regime (1987-2016)

Evidence from the 1987-2016 sample data for floating exchange rate regime (table 5) showed a stronger or more significant positive effect of exchange rate on economic growth in the mean equation. The result indicates that a percentage change in exchange rate leads to about 1.27 per cent change in growth. External debt revealed a significant negative effect on output growth in the post-reform period. The result shows that one per cent increase in external debt stock retards growth by 0.47 per cent. This is an indication of sub-optimal utilization of external borrowings, leading to net outflow of foreign exchange for debt repayment and debt servicing obligations. Inflation rate and interest rate showed non-significant positive effect on economic growth. The R-squared value of 0.988 implied that 98.8 per cent of change in economic growth is explained by the explanatory variables in the model. The Durbin Watson (1.82) result suggested no evidence of autocorrelation in the model.

With regard to volatility, the GARCH estimate showed significant transmission of positive exchange rate shocks to growth. The result produced evidence of significant volatility effect (γ_1) of exchange rate (p-value<0.01) on economic growth. The result further shows that exchange rate volatility during the floating or variable exchange rate regime was a significant impediment to economic growth. From the result, 1 per cent increase in the rate of exchange rate volatility reduced growth by approximately 0.04 per cent. This result is consistent with Mordi (2006) which produced evidence that exchange rate in Nigeria under the floating rate regime is highly volatile.

Table 5: GARCH Result (1987-2016)

Dependent variable: LGDP

Method: GARCH

Mean Equation			
Variable	Coefficient	z-Statistic	Prob.
LOG(GARCH)	-0.836020	-1.287446	0.1979
LEXR	1.270102	2.850405	0.0044
LEXD	-0.473025	-2.054629	0.0399
LINF	0.049470	0.173516	0.8622
LIR	0.649014	0.646782	0.5178
C	2.822766	0.711414	0.4768
Variance Equation			
C	0.189693	20.80555	0.0000
α_1	0.314096	0.710961	0.4771
γ_1	0.630375	3.281907	0.0010
LEXR	-0.036479	-9.275575	0.0000
R-Squared	0.988233		
Durbin Watson	1.824057		

Source; Authors' computation, 2018

4.4 Test for Heteroskedasticity: The ARCH Test

The presence of autoregressive conditional heteroskedasticity (ARCH effect) was investigated in the model using the heteroskedasticity test. The ARCH test for autocorrelation (Obs*R-squared = 0.410957; p-value= 0.5215) shown in table 6 produced no evidence of ARCH effect. This implies empirical support for the null hypothesis of no constant variance or no evidence of heteroskedasticity in the model. The result also indicates that the model is statistically significant in predicting the volatility end points, (F-statistic = 0.39611; P-value = 0.5323)

Table 6: Heteroskedasticity Test: ARCH

F-statistic	0.396311	Prob. F (1,43)	0.5323
Obs*R-squared	0.410957	Prob. Chi-Square (1)	0.5215

Source; Authors' computation, 2018

4.5 Test for Autocorrelation

The serial correlation test based on the correlogram of standardized residual squared is shown in table 7. As could be observed from the table, all the p-values are above 5 per cent significance level. The study therefore failed to reject the null hypothesis of no serial correlation in the estimated growth model. This implies that the mean equation was correctly specified. According to Uh (2005), when either of mean or conditional variance or both equations are correctly specified, all the Q-statistics of standardized residuals are observed to be non-significant with no traceable autocorrelation.

Table 7: Correlogram of standardized residual squared

Autocorrelation	Partial correlation	S/N	AC	PAC	Q-Stat	Prob*
.*| . |	.*| . |	1	-0.095	-0.095	0.4407	0.507
.*| . |	.*| . |	2	-0.181	-0.192	2.0836	0.353
. | . |	. | . |	3	0.06	0.022	2.2688	0.519
. |*. |	. |*. |	4	0.114	0.093	2.9538	0.566
. |*. |	. |*. |	5	0.122	0.169	3.7607	0.584
.*| . |	. | . |	6	-0.106	-0.041	4.3825	0.625
. | . |	. | . |	7	-0.017	0.004	4.399	0.733
. |*. |	. | . |	8	0.114	0.062	5.1537	0.741
. |*. |	. |*. |	9	0.091	0.095	5.646	0.775
.*| . |	.*| . |	10	-0.203	-0.173	8.1771	0.612
. |*. |	. |*. |	11	0.118	0.132	9.0535	0.617
.*| . |	.*| . |	12	-0.074	-0.165	9.4132	0.667
.*| . |	.*| . |	13	-0.073	-0.076	9.7699	0.713
. |** |	. |*. |	14	0.214	0.197	12.941	0.531
.*| . |	.*| . |	15	-0.161	-0.121	14.776	0.468
.*| . |	.*| . |	16	-0.165	-0.195	16.779	0.4
. |*. |	. |*. |	17	0.093	0.091	17.438	0.425
. | . |	.*| . |	18	-0.014	-0.081	17.452	0.492
. | . |	. | . |	19	-0.05	-0.065	17.658	0.545
.*| . |	. | . |	20	-0.086	-0.026	18.293	0.568

Source: Authors' computation, 2018

5 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

It was observed that exchange rate depreciated for most part of the study period (positive skewness). Over the entire sample period (1970-2016), exchange rate significantly promoted growth but retarded growth during the fixed regime, though not to a significant extent. However, the exchange rate effect on growth became significantly positive under the floating regime.

With regard to external debt, the study did not produce significant positive impact on growth over the entire sample period. The result for the fixed regime was positive and significant but its effect on growth during the floating regime was negative and significant. Inflation showed significant negative effect on growth in the full sample but under the fixed regime, the inflation effect was non-significant and negative. For the floating regime, inflation impeded growth though the impact was not significant. The study further revealed that interest rate has strong negative effect on growth over the entire sample period and during the fixed regime but its effect on growth during the floating regime was positive though non-significant.

In terms of volatility, the study did not show significant evidence of exchange rate volatility over the full sample period and under the fixed regime. However, under the floating regime, there was not only significant evidence of exchange rate volatility, but there existed also evidence of strong negative effect of exchange rate on economic growth.

Based on the above findings, the study concludes that exchange rate policy is a major determinant of economic performance in Nigeria. It is therefore recommended that exchange rate management in developing economies, like Nigeria, should follow a gradual transition process from the fixed to the floating exchange rate policy. In other words, as these nations develop and maintain a robust domestic production capacity, they should gradually liberalize their economic policies, including exchange rate in order to tap from

benefits of stable exchange rate.

ACKNOWLEDGEMENT

The authors duly acknowledge the kind support of Covenant University Ota towards their participation at the conference.

REFERENCE LIST

Abimbola A.B.& Olusegun A.J. (2017). Appraising the exchange rate volatility, stock market performance and aggregate output nexus in Nigeria, *Business and Economic Journal,* 8(1), 1-12, doi: 10.4172/2151-6219.1000290

Adedokun, A.J. (2012). Employment effect of exchange rate volatility in Nigeria's manufacturing sector. *Journal of Economic Theory*, 6(1), 14-25

Amin, A.A. (1996). The effects of exchange rate policy on Cameroon's agricultural competitiveness. *African Economic Research Consortium (AERC)*, Research Paper 42

Anyanwu, F.A.; Ananwude, A.C.; and Okoye, N.T. (2017), Exchange rate policy and Nigeria's economic growth, *International Journal of Applied Economics, Finance and Accounting,* 1(1), 1-13

Berman, N., Martin, P., & Mayer, T. (2012), How do different exporters react to exchange rate changes? The Quarterly Journal of Economics, 127(1), 437 492

Branson, W.H & Love, J.P (1998), The real exchange rate, employment and output in manufacturing in the US and Japan, National Bureau of Economic Research (NBER) Working Papers, 2491

Central Bank of Nigeria (1995), Monetary policy in Nigeria CBN Briefs, Research Department Series, 95 (3)

Edwards, S. & Levy–Yeyati, E. (2003), Flexible exchange rate as shock absorber, National Bureau of Economic Research (NBER) Working Paper, 9867

Federal Government of Nigeria (1989), Budget Speech

Frenkel, R. (2004). Real exchange rate and employment in Argentina, Brazil, Chile and Mexico, Retrieved, 28th February, 2018, http://policydialogue.org/files/events/Frenkel_Exchange_Rate_Employment.pdf,

Kidane, A. (1996). Exchange rate policy and economic reform in Ethiopia, *African Economic Research Consortium (AERC),* Research Paper 54

Lohi, J. (2014). Exchange rate regimes and inflation in Sub-Saharan Africa, *Journal of Economics and International Finance,* 6(8), 173-189

Mbaye, S. (2012), Currency undervaluation and growth: Is there a productivity channel? *Munich Personal RePEc Archive (MPRA)*, Paper 44261

Milambo C., Maredza .A. & Sibwa K. (2013), Effects of Exchange rate volatility on the stock market: A case study of South Africa. *Mediterranean Journal of social sciences, MCSER Publishing,* Rome-Italy. 14(14)

Mireille, L. (2007). The impact of the real exchange rate on manufacturing exports in Benin. African Region Working Papers Series, 107

Mohanty, B. & Bhanumurthy, N.R. (2014), Exchange rate regimes and inflation: Evidence from India, Working Paper 2014-130, National Institute of Public Finance and Policy, New Dehli

Mordi, C.N.O. (2006). Challenges of exchange rate volatility in economic management in Nigeria, *Bullion*, 30(3), 17-25

Ngandu, S. (2008), Exchange rates and employment, *South African Journal of Economics,* 76(S2), 205-221

Obadan, M.I. (2006). Overview of exchange rate management in Nigeria from 1986 to date, *Bullion,* 30(3), 1-9

Obi, K.O., Oniore, J.O. & Nnadi, K.U. (2016), The impact of exchange rate regimes on economic growth in Nigeria, *Journal of Economics and Sustainable Development,* 7(12), 115-127

Okafor, F. O. (2011). Fifty years of banking sector reforms in Nigeria (1960 – 2010): Past lessons- future imperatives. Enugu, Nigeria: Ezu Books Limited

Okorontah, C.F. & Odoemena, I.U. (2016, Effects of exchange rate fluctuations on economic growth of Nigeria, *International Journal of Innovative Finance and Economics Research,* 4(2), 1-7

Okoye, L.U.,.Evbuomwan, G.O., Ezeji, F.O. & Erin, O.A. (2018), Exchange rate management and economic development in Nigeria, Proceedings of the 31st International Business Information Management Association (IBIMA) Conference, Milan, Italy, May 25-26: 6740-6751

Okoye, L.U., Modebe, N.J., Erin, O.A. & Evbuomwan, G.O. (2017), Effect of external debt on economic growth: Evidence from Nigeria. Proceedings of the 29th International Business Information Management (IBIMA) Conference, Austria, Vienna-Austria, May 3-4: 4046-4058

Olokoyo, F.O. (2012). Foreign direct investment and economic growth: A case of Nigeria. *BVIMSR'S Journal of Management Research,* 4(1), 1-19

Rogoff, K.S., Husain, A.M., Mody, A., Brooks, R. & Oomes, N. (2003). Evolution and performance of exchange rate regimes. International Monetary Fund (IMF) Working Paper, WP/03/243

Sanger, D.E. & Wines, D. (2010), More countries adopt China's tactics on currency. New York Times, October, 3, http//en.wikipedia.org/wiki/exchange-rate, accessed, 29/3/2015

Stiglitz, J.E. (2001). Principles of financial regulation: A dynamic portfolio approach. The World Bank Research Observer, 6(1)

Subair, K. & Salihu, O.M. (2010), Exchange Rate Volatility and the Stock Market: The Nigerian Experience. [Online] Available at: www.aabri.com/OC2010Manuscripts/OC10113.pdf, Retrieved, 08/03/2018

Uh, R.S. (2005). Financial Institutions and Services, New York: Nova Science Publishers