The Relative Impact of Exchange Rate on Economic Growth in Nigeria: A Statistical Analysis

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ABSTRACT

This study examined the relative impact of exchange rate on economic growth in Nigeria, 1986-2016. The major objective was to investigate the relative impact of exchange rateon the economic growth of Nigeria. Other selected variables are credit to the private sector(CPS), and money supply (M_2).The study employed unit root test of stationarity, Johansen cointegration techniques and multiple regression analysis based on ordinary least squares (OLS) techniques. Results obtained indicated thatExchange rate positively and insignificantly affected economic growth in Nigeria for the period, Credit to the private sector negatively and insignificantly affected economic growth in Nigeria for the period under study, and Money Supply positively and insignificantly economic growth in Nigeria. Based on the findings and conclusion, the following recommendation was made- The Central Bank of Nigeria should make policy that will make the exchange rate to appreciate.

Keywords: Economic growth, Credit to private sector, Exchange rate; and Money Supply

INTRODUCTION

Exchange rate is the price of one currency in terms of another currency. More accurately, an exchange rate is the number of units of domestic currency required to obtain one unit of foreign currency. An exchange rate may also be defined as the number of units of foreign currency required to obtain one unit of domestic currency [1]. Exchange rate is the price of one currency in terms of another [2].Exchange rate, according to [3] is the rate at which a nation's currency exchanges for another nation's currencies.Hence, exchange rate refers to the price for which the currency of a country can be exchanged for another country's currency. Also, exchange rate refers to the price at which one country's currency is expressed in another country's currency. It can refer to the value of the currencies relative to each other. [4], writes that two concepts of exchange rate commonly distinguished; nominal exchange rate and real exchange rate. Transactions in the foreign exchange constitute an important aspect of

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financial sector activities and arguably it is the largest and most extensive financial market in the world. This is because apart from being the vehicle for settlement of international transactions, it functions as the medium of interaction between sellers and buyers of foreign exchange in a bid to negotiate a mutually acceptable price for the promotion and furtherance of international transactions. The financial sector is hugely affected by activities in the foreign exchange market primarily because of the central role of banks in financial intermediation. Foreign Exchange refers to as the financial transaction where currency value of one country is traded into another country's currency. The whole process gets done by a network of various financial institutions like bank, investors and government, [5].Economic growth is said to occur when a country's productive capacity is on the increase. Production of goods and services involve exports and imports which in involve transactions in foreign exchange, and exchange rate has been characterized by instability which has raised concern about its effect on economic growth [6]. The main objective of this study *was* to investigate the relative impact of exchange rate on the economic growth of Nigeria.. Apart from the Introduction, the other parts of this paper are- Empirical Review. Methodology,Data analysis and Result interpretations and Conclusion and recommendation.

EMPIRICAL REVIEW

On the study of exchange rate and economic growth in Nigeria, [7], studied the impact of interest and exchange rates on the Nigerian economy from 1975-2008. Data for the variables were collected from the CBN statistical bulletin. The study employed the ordinary least square (OLS) technique in the analysis but due to the fact that data are not stationary, a unit root test was employed; it further resorted to co-integration analysis which establishes the existence of a long run relationship between the variables in the models. From their findings they discovered that an increase in interest rate retards investment and subsequently economic growth; and the lag one of exchange rate shows the expected positive sign, implying that depreciation in exchange rate retarded growth from 1975 to 2008. Thus, interest and exchange rates exerted negative impact on the Nigerian economy during the period under review. [2], investigated the impact of real effective exchange rate on economic activities in Nigeria using the vector Error correction (VEC) model and found that depreciation of the naira impact negatively on aggregate demand and hence real GDP through adverse trade

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balance. [8], empirically analyzed 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. The study spanned from 2003–2013 and employed the Autoregressive Distributed Lag (ARDL) model. The findings revealed that exchange rate fluctuation has no effect on economic growth in the long run though a short run relationship exists between the two.

[9] , evaluated the impact of exchange rate on non-oil export for the period of 1986 to 2013. The study used co-integration and ordinary least squares regression analytical techniques. The result showed three co-integrating equations which establish the existence of long run relationship among the variables; also that effective exchange rate, money supply, credit to the private sector and economic performance have a significant impact on the growth of non-oil export in the Nigerian economy. Particularly, appreciation of exchange rate has negative effect on non-oil export which is consistent with the economic theory.

Using annual time series data for the period of 1980-2010, [3], empirically analyzed the impact of exchange rate

fluctuation on the Nigerian economic growth. The study used the ordinary least squares analytical techniques and provided evidence that real exchange rate has a positive effect on the economic growth of Nigeria. [6], explored foreign exchange market and economic growth in an emerging petroleum based economy from 1970-2003 in Nigeria. The author employed ordinary least squares regression techniques and found out that there is a positive linear relationship between exchange rate and economic growth in Nigeria.

Using annual data for the period 1986-2012, [10] investigated the effects of exchange rate fluctuation on economic growth of Nigeria. The analytical tools used include ordinary least square (OLS) technique, the Johansson co-integration test and the error correction mechanism (ECM). The findings revealed that there is no strong relationship between exchange rate and economic growth in Nigeria.

[11] empirically examined the impact of exchange rate on economic growth of Nigeria from 1986 to 2013. The authors used correlation and regression analysis of the ordinary least square and found among others that exchange rate has a non-significant positive impact on economic growth of Nigeria.

In an attempt to test the stability of parameter estimates using Chow test

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procedure, [12] carried out a quantitative analysis of the impact of exchange rate policies on Nigeria's economic growth to determine the structural stability of the relationship between exchange rate and output of goods and services. Their findings revealed that, apart from government expenditure (GEX), both exchange rate (EXR) and money supply (M2) are highly significant in the determination of Nigeria's economic growth performance. Also, the result of the Chow test showed that the relationship between exchange rate and economic growth performance in Nigeria have not undergone any significant structural changes in fixed and flexible regimes.

Also, several researchers have carried out research work on the banking sector and economic growth, [13], investigated the contributions of banking sector in economic growth of Pakistan. He collected data from the period of 1981 to 2010 of 10 banks. He used Augmented Dickey Fuller (ADF) and Philip Perron unit root test, ordinary least square and granger causality test. Unit root test confirms the stationary of all variables at first difference. Regression results indicate that deposits, investments, advances, profitability and interest earnings have significant positive impact on economic growth of Pakistan. The Granger-Causality

test confirms the bidirectional causal relationship of deposits, advances and profitability with economic growth. Also he found unidirectional causal relationship of investments and interest earnings with economic growth runs from investments and interest earnings to economic growth

[13], re-examined the nexus between financial sector development and economic growth in Nigeria over the period 1970-2011 The paper investigated the hypothesis that financial development is positively related to growth. Using four measures – ratios of broad money (MSY), bank deposit liabilities (BDY), domestic credit (DCY), private sector credit (PSY) – to proxy financial development, and adopting Granger causality tests in a VAR framework, the empirical result suggested that financial sector development is positively related to and therefore causes economic growth just as finance is growth dependent – a case of bi-directional causality. The variance decomposition shows that the variations in DCY and PSY are significantly and dominantly affected by MSY.

[14], studied Impact of banking sector development on economic growth: Another look at the evidence from Nigeria. The study re-examined the long run relationship between financial

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development indicators and economic growth in Nigeria over the period 1970-2010. Using the [9], approach to co integration and Vector Error Correction Modelling (VECM). The findings of the study revealed that in the long-run, liquid liabilities of commercial banks and trade openness exert significant positive influence on economic growth, conversely, credit to the private sector, interest rate spread and government expenditure exert significant negative influence. The findings implied that, credit to the private sector is marred by the identified problem and government borrowing and high interest rate are crowding out investment and growth.

[15] examined the impacts of private sector credit on economic growth in Nigeria using the [12], cointegration test that accounted for structural breaks and endogeneity problems on the quarterly time series data spanning from 2000:Q1 to 2014:Q4. The authors used fully modified ordinary least squares (FMOLS) and Error correction model procedures. The result provided evidence of a long-run relationship between output and its selected determinants, albeit, with a structural break in 2012:Q1. The findings also revealed a positive and statistically significant effect of private sector credit on output, while increased prime lending rate was inhibiting growth. Using the two-stage least squares regression analysis,

[16], investigated the effect of private sector investment on economic growth in the liberalized Nigerian economy from 1986 to 2014. The authors represented economic growth by Gross Domestic Product and private sector investment variables with domestic private investment, foreign direct investment and foreign portfolio investment using exchange rate, interest and inflation rate as control variables. Being a time series data, the authors used co-integration test and ordinary least squares multiple regression analysis. The findings indicated that private sector investment and economic growth have long run significant effect on one another. The findings also revealed that Domestic Private Sector Investment (LnDPSI), Foreign Direct Investment (LnFDI), Foreign Private Investment (LnFPI), and Interest rate have a positive relationship with real GDP while Inflationary Rate (INFR) and Exchange rate have a negative relationship with real GDP in Nigeria. The study further provided evidence of unidirectional causal relationship from domestic private sector investment (DPSI) to gross domestic product (GDP). The granger causality test results further provide evidence of unidirectional causality running from GDP FPI, EXCHR, INTR and INFR respectively.

[17], carried out an empirical study to examine the impact of credit to private

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sector (CPS) on the real sector of Nigeria with a view to assess the significant contribution of CPS to real sector growth in Nigeria. The study used aggregate time series data from 1986 to 2010, and employed the multiple regression analysis. The findings provided that there is a statistically significant impact of credit to private sector on the real sector of Nigeria.

[18] analyzed the impact of bank domestic credits on the economic growth of Nigeria. The study made use of annual time series Nigerian data for the period of thirty three (33) years (1980-2013); credit to private sector, credit to government sector and contingent liability were used as proxy for bank domestic credit while gross domestic product represents economic growth. The analytical tool used was ordinary least squares regression techniques and the findings revealed that credit to the private sector (CPS) and Credit to the government sector (CGS) positively and significantly correlate with GDP in the short run while there is a long-run relationship between bank domestic credit indicators and gross domestic product in Nigeria.

[19], investigated the impact of bank credit on economic growth in Nigeria from 1960-2011. Applying the reduced form of vector autoregressive (VAR) technique, the authors provided evidence of a significant positive relationship between bank credit to the private sector, broad money supply and economic growth in Nigeria.

METHODOLOGY

The study used a secondary sourced data extracted the Central Bank of Nigeria (CBN) statistical bulletin, 2016 edition. Research design adopted was *ex-post facto* research design while the fundamental model for the study was the modified multivariate regression model following [15]. Generally the multivariate regression model is stated thus:

$$Y_t =$$

$$\alpha_O + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_k X_k + \mu_t$$
- - $(eqnuation1)$

Where;

Y_t = *Dependent or Response variable =Gross Domestic Product (GDP)*

X_1, X_2, X_3 = *Independent or Explanatory variables = Credit to Private Sector (CPS), Exchange rate (EXCHR), and Broad Money Supply (M2; the control variable)*

α_O = *Constant*

$\beta_1, \beta_2, \beta_3$ = *Regression parameters or*

coefficients of the regression estimates.

GDP_t =

μ_t = Error term

$\beta_0 + \beta_1 CPS_t + \beta_2 EXCHR_t + \beta_3 M2_t + \varepsilon_t$
- - (eqnuation1)

Such that:

DATA ANALYSIS AND RESULT INTERPRETATIONS
Stationarity Test

Table 1: Summary of ADF Unit root test

Variable	ADF-Stat	C.V @5%	p-value	Stationarity O(I)
LGDP	-5.41	-3.57**	0.0007	I(1)
LCPS	-4.13	-2.97**	0.0033	I(1)
LEXCHR	-5.47	-2.97**	0.0001	I(1)
LM2	-3.93	-3.57	0.0233	I(1)

*,**,*** Indicates stationary at 1%, 5%, and 10% level of significance

Source: Author's Extract from E-views 9.0 output

The ADF unit root test results in table 1 shows that the ADF statistics of the variables were more negative than the critical values at 5% hence, they are said to be integrated of order one (i.e., I(1)). In other words, they are stationary at first differencing.

Table 2: Summary of long run equilibrium relationship test among the variables using Johansen and Juselius method

Trace Statistic Approach					Maximum Eigenvalue Approach		
Hypothesized No. of CE(s)	Eigenvalue	Trace stat.	5% CV	Prob.	Max-Eigen stat.	5% CV	Prob.
r=0	0.442092	28.32	29.80	0.0733	16.92	21.13	0.1757
r≤1	0.234059	11.40	15.49	0.1882	7.73	14.26	0.4065
r≤2	0.118701	3.66	3.84	0.0556	3.66	3.84	0.0556

*indicates cointegration
Source: Researcher's computation from Eviews 9

The Johansen cointegration test results (both the trace statistic and maximum eigenvalue approach) above agreed that there is no cointegrating equation at the 5% level of significance. This implies that

the variables have no long run relationship among themselves

Heteroskedasticity, Ramsey RESET, and Stability Test Results The Heteroskedasticity (white) test result with F-statistic value of 1.74 and p-value of 0.1411indicates that the researcher

which implies that there is no functional form problem in the model and that the explanatory variables have significant

upholds that the series of the dataset come from a homogeneous population.

The Ramsey Regression Error Specification test (Ramsey RESET) with F-statistic value of 5.03 and associated probability value of 0.0336 < 0.05 indicate that the model is correctly specified

power in explaining the response variable in the regression model.

Table 3: Regression Result

Variable	Coefficient	Std. error	t-statistic	p-value
Constant	2.301	0.515	4.466	0.0001
LCPS	-0.131	0.454	-0.288	0.7757
LEXCHR	0.084	0.175	0.479	0.6362
LM2	1.002	0.533	1.882	0.0716

R^2 = 0.992; F-stat. = 599.844; P(F-stat.) < 0.001; D-W stat. = 1.635

Source: Author's Extract from Eviews

The regression result on table 3 indicates that exchange rate with a coefficient of 0.084 has a positive effect on the Nigerian economy. Again from the regression result credit to the private sector (CPS) with a coefficient of -0.131 has a negative effect on the economic growth of Nigeria. Furthermore, money supply (M2) as the moderating variable has a positive effect on the economic growth of Nigeria with a coefficient of 1.002. Exchange rate has insignificant effect on the growth of Nigerian economy with t-statistic= 0.479, p-value 0.6362 > 0.05. Credit to the Private Sector has insignificant effect on the growth of Nigerian economy. Also,

money Supplyhas insignificant effect on the growth of Nigerian economy.

Jointly with money supply (M2) as the moderating variable, the Credit to the private Sector, Exchange rate and Money Supply have joint significant positive effect on the growth of Nigerian economy with F-stat. = 599.844; P(F-stat.) < 0.001

The R-sq. value of 0.992 indicates that the independent variables in the model could explain about 99.2% of the total variation in economic growth in Nigeria. Only about 0.8% are unexplained. The Durbin-Watson estimate (D-W stat. = 1.635) which is closer to 2 than to zero shows that there

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is no problem of serial correlation in the model.

CONCLUSION AND RECOMMENDATION

This research focused on the relative impact of exchange rate on the economic growth of Nigeria. The result showed that Exchange rate has a positive and insignificant effect on gross domestic product in Nigeria. The credit to the private sector has a negative and insignificant effect on Nigeria's economic growth. Money Supply has a positive and insignificant effect on Nigeria's economy. The Central Bank of Nigeria should make policy that will make the exchange rate to appreciate.

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