FISCAL DEFICIT AND EXCHANGE RATE MOVEMENT: EMPIRICAL EVIDENCE FROM NIGERIA

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Abstract

For the case of using fiscal deficit by policy makers, economists have conflicting views and have incessantly debate how it affects exchange rate depreciation. This study empirically investigates the attendant relationship for the Nigerian case. At first, we review related literature sequel to which we utilized appropriate econometric techniques. The study employs the bounds testing Autoregressive Distribution Lag (ARDL) approach to examine the long run and short run relationships between fiscal deficits and exchange rate depreciation. Amongst others, one finding was that for the Nigerian economy, fiscal deficit has a negative impact on exchange rate depreciation - an indication that government fiscal deficit is not a major cause of exchange rate movements for the periods studied. In effects, we recommend that in other to attain both internal and external balance in pursuance of objective of fiscal policy, fiscal management without political interests should be conducted and other macroeconomic policies should be properly implemented as they may have been the cause of sporadic exchange rate depreciation.

Key words: Fiscal Deficit, Exchange Rate and Macroeconomic Policies

Introduction

In the world, since the change from fixed exchange rates and the enactment of policies to transit from centrally planned economies to market-oriented in 1973, the exchange rate has been highly volatile. The excessive variability of exchange rate is occasioned by numerous macroeconomic policies measures which influence it. Generally, there is consensus among policy makers to adjust oscillation of the exchange rate. Policy makers favour to stabilize the changing exchange rate because excessive short-term volatility and long term swings that 'overshoot' values characterized by economic fundamental erodes the market

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confidence and affects real sector and financial market. Recent studies (Gosh et al, 2008; Ostry et al, 2010; and Ostry et al, 2011) have looked into how policies can help manage large capital inflows and the associated exchange rate pressures. The overall conclusion is that, before resorting to capital controls, domestic macroeconomic policies including through fiscal consolidation should be appropriately set. Despite policy implementation, official exchange rate continues to fluctuate.

The incessant instability in exchange rate has over the years raised questions whether policymakers understand precisely the policy relationship between variables in the real, monetary and external sectors. Numerous empirical investigations have therefore been conducted on the relationship between both monetary and fiscal policies on exchange rate fluctuations. The empirical evidences suggest that monetary policy in major advanced economies has substantial effect on exchange rate pressure. In fact, there is now less controversies that monetary policy affects exchange rates fluctuation (Andersen et al., 2003; Qi and Wu, 2003). Indeed, monetary fundamentals are now typically considered to be major economic drivers of exchange rate movements (Engel and West, 2005; IMF, 2011a and 2011b). Aside monetary policy, some literatures have contained that fiscal policy managed through fiscal deficit has impacts along with monetary interaction on real exchange rates fluctuation. It has been argued (Edwards, 1989) that real effects of nominal devaluations persist only if the devaluations are accompanied by fiscal adjustments. Also, early theoretical studies (Obstfeld, 1985; Frenkel and Razin, 1986) demonstrate that fiscal policy could have substantial effects on floating exchange rates. However, while there is general agreement that fiscal operations as cutting budget deficits and debt will lower interest rates, debates persist over its effects on a country's exchange rate movement. Although, fluctuation in exchange rate is not extremely regular in advanced economies but such occasioned by fiscal stance still persists in developing countries (Devereux and Purvis, 1990)

The workings of theories is unambiguous on its predictions that changes in fiscal deficits have impact on exchange rate movements, but existing empirical works provides conflicting evidences on the effect for advanced economies and also emerging countries already studied. One major striking observation however is that African countries have not been adequately investigated to determine whether fiscal deficit significantly affect exchange rate movement despite that most African economies finance their budget with deficits. This study attempts to provide evidence for Nigeria. The main objective of the study is to investigate the effects of the fiscal deficits on exchange rate depreciation. The investigation is an attempt to known the degree at which fiscal policy operations influences the foreign exchange market in Nigeria. The paper is organized into five sections. Following the introduction presented in this section, section two reviews relevant

literatures on fiscal deficit, exchange rates and their interdependence. Section three focuses on model specification and estimation procedure while section four deals on the results. Lastly, section five concludes.

Fiscal Deficits and Exchange Rates in Nigeria

The Nigerian government has experienced fiscal deficit for years. Fiscal deficits have continued to grow from N809.87 billion in 2009 to N1, 706.01 billion in 2010 and N1, 158.52 billion in 2011. The increasing fiscal deficit posed great challenge to the government fiscal operations during the period since it signified that government had to supplement the revenue shortfall. It is also in contrast to the government's determination of ensuring that the deficit followed a downward trend over the medium-term so as to achieve sound fiscal consolidation and inclusive growth. The country was successful in building fiscal reserves to about US$9 billion and the size of the overall fiscal deficit was 2.41% of GDP in 2012 due to the 50% reduction of oil price subsidy and low implementation of capital projects. In Nigeria, government has greater influence on the nation's economic activities through the use of fiscal instruments amongst which are budget deficit operation. Government has continuously pursued an expansionary fiscal policy with the exception of the years 1970, 1971, 1973, 1974, 1979, 1980 and 1996 (CBN, 2005). However, this has effect on macroeconomic variables such as interest rate, exchange rate, inflation, consumption, investment, etc which serve as media through which budget deficit affects economic development. Historically, Nigeria started experiencing budget deficit in her budgetary system since 1957 and became persistent in the 1970s prior to the civil war of 1967 to 1970 (Oyejide, 1972) and up till date, Nigeria only has seven years of budget surplus CBN (2005).

Nigeria has practiced both fixed and flexible exchange rates. Between 1960 and 2000, exchange rate policy in Nigeria has fluctuated from a fixed exchange rate system (1960-1986) to a flexible exchange rate system (1986-1993). More explicitly, prior to the year 1986, Nigeria practiced a fixed exchange rate, when the Naira was pegged against the British pound and later on the US dollar. But in a bid to correct her persistent balance of payment problem and restore structural balance, flexible exchange rate policy was adopted, and the Nigerian exchange rate was allowed to float and its value relative to the US dollar determined by market forces of demand and supply. Some of the policies employed to ensure exchange rate stability included among others: Second-Tier Foreign Exchange Market (SFEM), Autonomous Foreign Exchange Market (AFEM), Inter-bank Foreign Exchange Market (IFEM), the enlarged Foreign Exchange Market (FEM), and the Dutch Auction System (DAS). The failure of one policy to achieve stability in the exchange rate led to the adoption of another.

Despite various efforts by government to maintain exchange rate stability (as well as avoiding its fluctuations and misalignment) in the last two decades, the Naira

continued to depreciate against the US dollar. For example, the Naira appreciated against the US dollar from N0.7143 in 1970 to N0.6159 in 1975 and further to N0.5464 in 1980. However, the exchange rate depreciated throughout the 1980s. For instance, the naira depreciated from N0.6100 in 1981 to N2.0206 in 1986 and further to N8.0378 in 1990. Although the exchange rate became relatively stable in the mid-1990s, it depreciated further to N102.1052, N120.9702, and N133.5004 in 2002, 2002, 2004; respectively. Thereafter, the exchange rate appreciated to N132.147, N128.6516, and N117.968 in 2005, 2006, and 2007; respectively. In early 2009, the Naira depreciated to N170 against the US dollar. CBN revealed that the official exchange rate of Naira against the US dollar (US$) decreased from N148.88/US$1 in 2009 to N150.3/US$1 in 2010 and further down to N153.85/US$1 in 2011. The premium between the official and Bureau De Change (BDC) however narrowed from N12.76 in 2009 to N2.68 in 2010 before slightly edging up to N5.46 in 2011. The Exchange rate of Naira against other currencies like the British Pound Sterling and the Euro showed a fluctuating trend over the review period. For instance, the Pound Sterling which exchanged for N230.75/£1 in 2009 depreciated slightly to N229.38/£1 in 2010 before slightly appreciating to N242.6/£1 in 2011. In the same vein, the Euro which exchanged for N205.39/€1 in 2009 depreciated N196.53/€1 in 2010 before appreciating slightly to NN212.62/€1 in 2011. The France CFA however continued to be relatively stable against the Naira as it exchanged for N0.31/1CFA, N0.30/1CFA and N0.32/1CFA in 2009, 2010 and 2011 respectively. The exchange rates of Nigeria against some major currencies are presented in table 1.1 below.

Table 1: Annual Average Exchange Rate of Naira Against Major Currencies, 2009-2011

Currency	2009	2010	2011
USD (₦/$)	148.88	150.3	153.85
British Pound Sterling (N/£)	230.75	229.38	242.6
–	205.39	196.53	212.62
Fance CFA (N/CFA Fr)	0.31	0.3	0.32

Source: CBN, Statistical Bulletin, 2011

Literature review

A vast majority of empirical literature on how fiscal deficit impact on exchange rate exists especially in advanced economies and few for developing countries, but empirical evidences presented are comprehensive but not exhaustive. *Easterly and Klaus (1994)* studied behavioral relations for these variables for some sampled emerging countries using *Rodriguez's model (1989)*. The *Rodriguez's hypothesis (1989)* conveys that for a given trade deficit, an increase in public spending affects the real exchange rate because such an increase implies

a corresponding decline in private spending. If the public sector has a higher propensity than the private sector to spend on imports rather than domestic goods, a shift to more public and less private spending implies increased demand for imports and a corresponding depreciation of the real exchange rate. *Easterly and Klaus (1994)* econometric estimates were derived for the sensitivity of the trade balance and the real exchange rate to various fiscal variables. Model estimates for eight countries-Argentina, Chile, Colombia, Cote d'Ivoire, Ghana, Mexico, Thailand, and Zimbabwe-found significant evidence that rising public surpluses are accompanied by rising trade surpluses. For eight countries these rising trade surpluses lead to depreciation of the real exchange rate. For Ghana, a rising public deficit leads directly to appreciation of the real official exchange rate. The only contrary result was for Pakistan, where deficit reduction through reduced public investment leads to appreciation of the real exchange rate because of the depressing effect of lower public investment on domestic output. Tests of this hypothesis show split results for the sample countries: higher government spending leads to an appreciation of the real exchange rate for Argentina, Cote d'Ivoire, Morocco, and Zimbabwe and to depreciation for Chile, Colombia, and Mexico. These empirical results support the notion that the real exchange rate is sensitive to both policy and external variables, with the fiscal deficit prominent among them. These findings, together with those on the positive relation between trade deficits and fiscal deficits strongly support the hypothesis that real exchange rates move closely with fiscal deficits.

Hakkio (1996) analyzes the effects of budget deficit reduction on a country's exchange rate. First, he shows that the evidence on the relationship between budget deficits and exchange rates is not clear-cut and explains why the theory that underlies the relationship is ambiguous. To sort out the ambiguity, he provides new empirical results indicating that deficit reduction through tax increases tends to weaken the exchange rate of countries with good records on inflation and debt, while deficit reduction through spending cuts tends to strengthen the exchange rate of countries with poor records on inflation and debt. Bectsma et al (2008), analyses the effects of spending stocks on trade and budget balances in a panel of 14 EU countries. They find that government spending shocks leads to higher budget deficits, real appreciations and fall of trade balances in line with the "twin deficits" hypothesis.

Benetrix and Lane (2009b) assess the effects of the composition of government spending on the behavior of the real exchange rate in a panel data with the euro area countries. They observe that higher government consumption leads to real appreciation, whereas public investment increase cause a decline in the relative price of non-tradable and may thereby lead to real depreciations. *Jingping, Qi, and Jian (2009)* observed that fiscal deficits contradictions in both countries (of bilateral transaction on dollar base) or at least in a presumably dominant country (e.g. US) typically can lead to faster mean reversion of real exchange rates. This

finding upheld the argument that there are stronger monetary policy impacts on exchange rates in the absence of fiscal deficits in advanced economies. They observed also that emerging countries too are not left out as there is a dynamic nexus of relationship between macroeconomic variables in their economies.

Christopher, Metu and Nwachukwu (2012) in his study analysed the behavior of the bilateral real exchange rate and fiscal variables in Nigeria from the period 1970 2012 to address the linkage between these variables. The analytical technique employed is that of the Ordinary Least Square and Instrumental Variable (OLS, IV) method using the Hildreth Lu grid search method and by expanding the previously given list of the Instrumental Variable to include the once-lagged values and the relevant variables in establishing the relationship. The empirical result suggests that: Real devaluation improves fiscal balance and that budget deficit influences the behavior of real exchange rate. Again the increase in income associated with exchange rate depreciation increases import and depreciates the balance of payments.

Badia and Segura-Ubiergo (2014) observed that some emerging markets have experienced substantial real exchange rate appreciation in recent years, generating concerns about competitiveness and prompting policymakers to respond with a combination of mitigating policies. Their study shows that fiscal policy can play a role in alleviating these pressures. Using a sample of 28 emerging market economies over 1983 - 2011. They estimate a dynamic model of the real exchange rate and find that a permanent fiscal adjustment may reduce appreciation pressures over the long term. To illustrate the importance of these findings, they focus on the case of Brazil. Their results suggest that maintaining fiscal discipline while increasing public investment in Brazil is likely to ease real appreciation pressures.

Model Specification and Estimation Procedure

Model Specification

In order to determine how fiscal deficit influences movement of the exchange rates in the foreign exchange market, this study investigates if fiscal deficit has significant effect on exchange rate depreciation. For modeling purpose, we estimate the following theoretical model:

$$EXRD = f(FISD, DEBT, RGDP, OPEN, GMS2) \qquad (1)$$

The variables employed are defined: exchange rate depreciation (EXRD), government fiscal deficit (FISD), growth rate of government external debt stock (DEBT), growth rate of the gross domestic product (RGDP), trade openness (OPEN) and growth rate of broad money supply (GMS2). *E* represents the error term of our stochastic model. Apriori sign expectations are: $_{0, 1, 2, 5} > 0$ and $_{3, 4} < 0$ (this suggests that all the variables except OPEN and GRGDP are expected to have positive impact on exchange rate depreciation). Ceteris paribus, while the

increase fiscal deficit, debt stock and broad money supply will lead to more exchange rate depreciation, increase GDP is expected to lead to exchange rate appreciation (or reduced depreciation). On openness, the expectation is that the more open the economy is, the more it tendency to increase trade so that export will increase which will generate more inflow and as a consequent lead to exchange rate appreciation.

Methodology and Estimation Procedure

The study employs the bounds testing *Autoregressive Distribution Lag (ARDL)* test proposed by Pesaran*et al.* (2001) to examine the long run and short run relationships between fiscal deficits and exchange rate depreciation. Before using the ARDL to estimate the error correction model (ECM) and the long run parameters, we carried out necessary pretest both unit root and cointegration tests to justify the applicability of ECM. The unit root test serves two purposes. First is to investigate whether or not exchange rate depreciation, fiscal deficit, government external debt, degree of openness, growth rate of gross domestic product and broad money supply are stationary. This helps to determine the underlying properties of the process that generates our time series. That is, to investigate whether each variable in equation (1) is stationary. Second is to established order of integration. This investigation is necessary to ensure stability in subsequent econometric modeling. To test for unit roots, we employed the Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) tests which use equation 2 and 3 (below) respectively, to test for the null hypothesis of non stationarity (i.e. presence of unit roots) for the series X_t.

$$X_t = {}_0 + {}_1 X_{t-1} + {}_t \qquad (2)$$

$$\Delta X_t = \beta_0 + \beta_1 X_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta X_{t-1} + E_t \qquad (3)$$

Whereμ_t and $E_t \sim$ NID (0, ^{2}) and X_t represents each series of *EXRD, FISD, DEBT, RGDP, OPEN and GMS2* in equation (1). The t-statistics obtained are compared with the special critical value constructed by Dickey Fuller (1979, 1981) and Engle and Granger (1987, 1990).

The cointegration among time series variables suggests that series may behave in different way in the short run [being either I(0) or purely I(1)], but that they will converge towards common equilibrium behaviour in the long run. The study adopt general-to-specific modeling approach guided by the short data span and Schwarz Information Criteria (SIC) respectively to select a maximum lag order for the conditional ARDL bound test. We follow the procedure codified in Peseran et al. (1997). At first, we estimated an OLS regression for the first differences part of equation (4, see below) and then test for the joint significance of the parameters of the lagged level variables when added to the first regression. This OLS regression in first differences is of no direct interest to the bounds cointegration test (Peseran et al., 1997).

The ARDL is used to estimate our long and short run relationship. The approach is the appropriate technique for our study for three reasons. First, adopting the bound testing approach means that pretest such as unit root is not may not all be integrated of same order. That is all regressors can either I(0), purely I(1) so long as they are mutually cointegrated. Secondly, the long-run and short run (parsimonious ECM) parameters of the models can be simultaneously estimated. Thirdly, compare to other multivariate cointegration methods (for example, Johansen and Juselius, 1990), the ARDL test is a simple technique because it allows the cointegration relationship to be estimated by OLS once the lag order of the model is identified. Essentially, the bounds test suggests that the variables of interest put in the framework (our model) are bound together in the long-run. If we define as the maximum number of lags to be used and k as the number of variables in each equation, then the test estimates number of regressors in order to obtain the optimal lag length for each variable.

The ARDL model specification for equation (1) is;

$$\Delta InEXRD_t = \alpha + \sum_{i=1}^{\eta} \beta_i \Delta InEXRD_{t-i} + \sum_{i=0}^{b_1} \gamma_i \Delta InFISD_{t-i} + \sum_{i=0}^{b_2} \delta_i \Delta InDEBT_{t-i} + \sum_{i=0}^{b_3} \mu_i \Delta InRGDP_{t-i} + \sum_{i=0}^{b_4} \Omega_i \Delta InOPEN_{t-i} + \sum_{i=0}^{b_5} \omega_i \Delta InGMS2_{t-i} + \pi_1 InEXRD_{t-1} + \pi_2 InFISD_{t-1} + \pi_3 InDEBT_{t-1} + \pi_4 InRGDP_{t-1} + \pi_5 InOPEN_{t-1} + \pi_6 InGMS2_{t-1} + \varepsilon_t \quad (4)$$

In equation (4), and = lag length for the Model, Δ = first differencing operator and ε = white noise disturbance error term. The long-run and short-run parameters of equation 5 and 6 would be estimated once a cointegration is established. The long-run relationship specification is:

$$InEXRD_t = \Psi + \sum_{i=1}^{\eta} \theta_i InEXRD_{t-i} + \sum_{i=0}^{b_1} \theta_i InFISD_{t-i} + \sum_{i=0}^{b_2} \theta_i InDEBT_{t-i} + \sum_{i=0}^{b_3} \theta_i InRGDP_{t-i} + \sum_{i=0}^{b_4} \theta_i InOPEN_{t-i} + \sum_{i=0}^{b_5} \theta_i InGMS2_{t-i} + \varepsilon_t \quad (5)$$

However, to restore equilibrium proximately may not be possible because of the speed of adjustment. This could be caused by the lags and adjustment process used to capture changes in any of the factors affecting fiscal deficit or exchange rate depreciation overtime. Hence, ECM can be used to capture the speed of adjustment of exchange rate depreciation equation. The ECM is:

$$\Delta InEXRD_t = \rho + \sum_{i=1}^{\eta} \beta_i \Delta InEXRD_{t-i} + \sum_{i=0}^{b_1} \gamma_i \Delta InFISD_{t-i} + \sum_{i=0}^{b_2} \delta_i \Delta InDEBT_{t-i} + \sum_{i=0}^{b_3} \mu_i \Delta InRGDP_{t-i} + \sum_{i=0}^{b_4} \Omega_i \Delta InOPEN_{t-i} + \sum_{i=0}^{b_5} \omega_i \Delta InGMS2_{t-i} + \lambda ecm_{t-1} + \varepsilon_t$$

Where: the error correction term lagged for one period and = the coefficients for measuring speed of adjustment in equation (6). In this ECM equation, we assume a lag length of *t-i*. Each coefficients of equation 6 represents the short run dynamics of the model.

Empirical Results from Data

Pretest: unit root and cointegration test

The results of the pretest are provided in Tables 1, 2 and 3 below. The pretest was necessary to confirm if the ARDL approach is appropriate. The results in Tables 1 and 2 show that there is no enough evidence to accept the null hypothesis of non-stationary for all the series using the DF/ADF test-statistics. All the variables are not integrated of same order. That is, some of variables either I(0) or purely I(1). If all the I(0) and I(1) series are mutually cointegrated, then the ARDL approach is unequivocal an appropriate technique for our estimation. Table 3 shows the results of the calculated F-statistics (Wald test) when each variable is considered as a dependent normalized variable in the ARDL-OLS regressions. This result reveals that the calculated F-statistics (8.146) is higher than the upper bound critical value (6.650) at 1% error level. Based on this, we conclude that a long run cointegration relationship exists for the estimated ARDL models. Thus, the null hypotheses of no cointegration are rejected. This implies exchange rate depreciation (EXRD) and representative independent variables are cointegrated.

Table 1: Unit root test for stationarity in level form
(Regression include an intercept without a linear trend)

Variables X_t	DF Statistics	ADF test Statistics	ADF Lag Length	ADF Critical Value	Remarks
EXRD	-1.8941	-0.3258	1	-2.8872	Non-stationary
FISD	-0.0443	-1.6317	2	-2.8870	Non-Stationary
DEBT	-4.2394	-3.8190	1	-2.8872	Stationary
OPEN	-10.5514	-7.8823	1	-2.8872	Stationary
RGDP	-1.5554	-1.3724	1	-2.8872	Non-Stationary
GMS2	-10.2613	-6.9809	1	-2.8872	Stationary

Table 2: Unit root test for stationarity in first difference
(Regression include an intercept without a linear trend)

Variables X_t	AD Statistics	ADF test Statistics	ADF Lag Length	ADF Critical Value	Order of Integration
EXRD	-9.8939	-7.3411	1	-3.4501	I(I)
FISD	-0.4408	-3.3256	2	-3.4497	I(I)
DEBT	-4.7579	-4.3632	1	-3.4501	I(0)
OPEN	-10.5017	-7.8311	1	-3.4501	I(0)
RGDP	-10.7441	-20.9154	1	-3.4501	I(I)
GMS2	-10.5311	-7.2684	1	-3.4501	I(0)

Model Estimation and Stability

Since cointegration is established in our test, then it follows that a non-spurious long run relationship exists and the error correction representation can be obtained. The result obtained by normalizing on EXRD in the long run is reported in Table 4 while Tables 5 and 6 present the result of the short-run dynamic coefficients and the model diagnostic and stability tests, respectively.

Table 4: Estimated long run coefficients of lnEXRD

	Coefficient	*t-ratio*	*p-value*
Const	2.0592	1.9680	0.0517*
LnFISD	76295.8	(4.7481)	0.0195**
LnDEBT	2.0345	(3.3516)	0.0813*
LnRGDP	-1.8103	-1.6500	0.0877**
InOPEN	-2.0288	(-3.4188)	0.1240
InGMS2	-3.4801	(-2.8770)	0.0061*
Note: *(**)[*] indicates rejection of the null hypothesis at 1% (5%)[10%] significance level.			

Table 5: Regression results for the ECM

Regressor	Coefficient	Standard error	T-ratio	*p-value*
INPT	8.59660	7.16900	-1.1991	0.233
Δ InFISD	-0.00023	0.00010	-2.3223	0.022
Δ InDEBT	-0.15990	0.30928	-0.5170	0.606
Δ InRGDP	-0.05304	0. 38229	-0.1387	0.890
Δ InGMS2	0.68657	0.42550	1.6133	0.110
ΔInOPEN	-0.0110	0.0557	-0.1977	0.8447
ECM(-1)	-0.30000	0.00000	0.0000	0.000
R-squared	0.7844	Adjusted R-squared	0.7152	
F-stat	4.7720	Schwarz criterion	-33.8243	
*Note: ***, ** and * Indicates significant at 1%, 5% and 10% respectively*				

Table 6: Diagnostic Tests Results

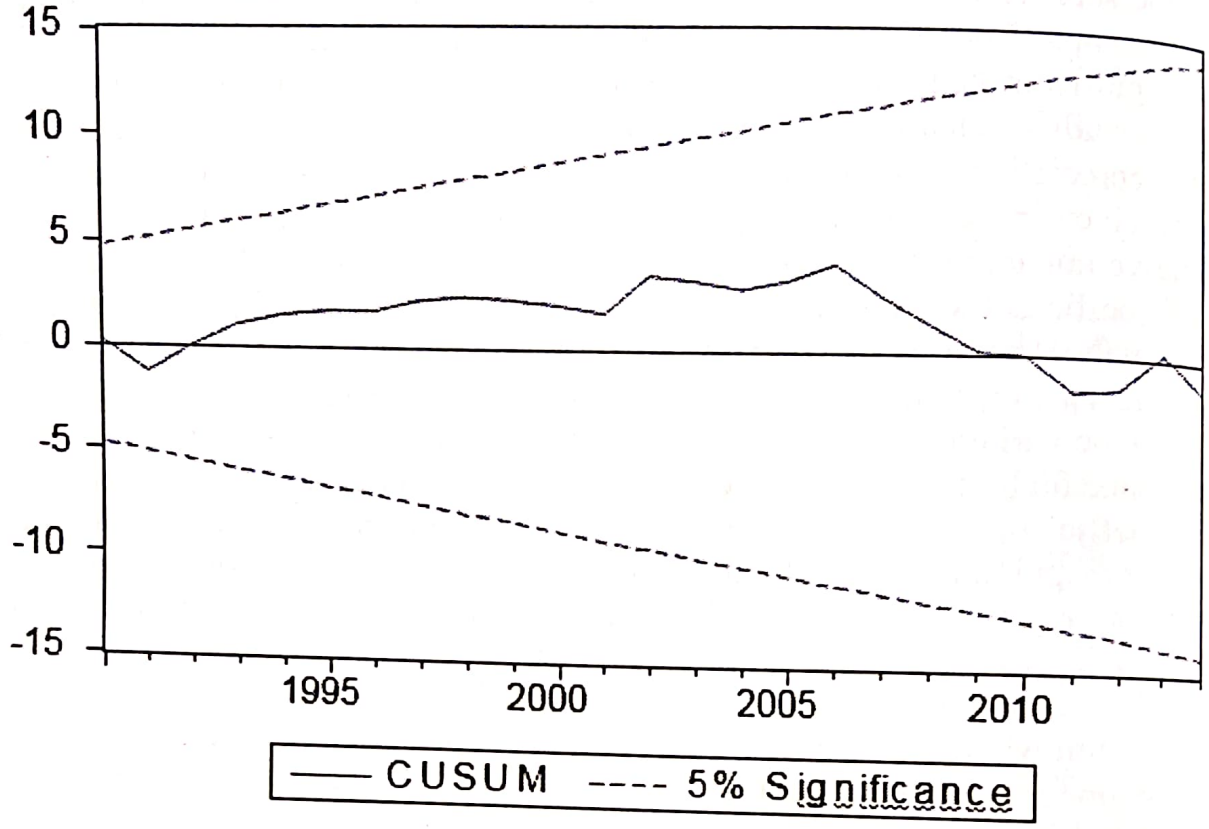
Test	Results	*p-value*
Ramsey RESET Test	12.88170	0.0007
Normality test	50.56697	0.0000
Heteroskedasticity Test:	22.52111	0.3129
Breusch-Godfrey LM Test:	2.663907	0.2639
Source: Author's Computation		

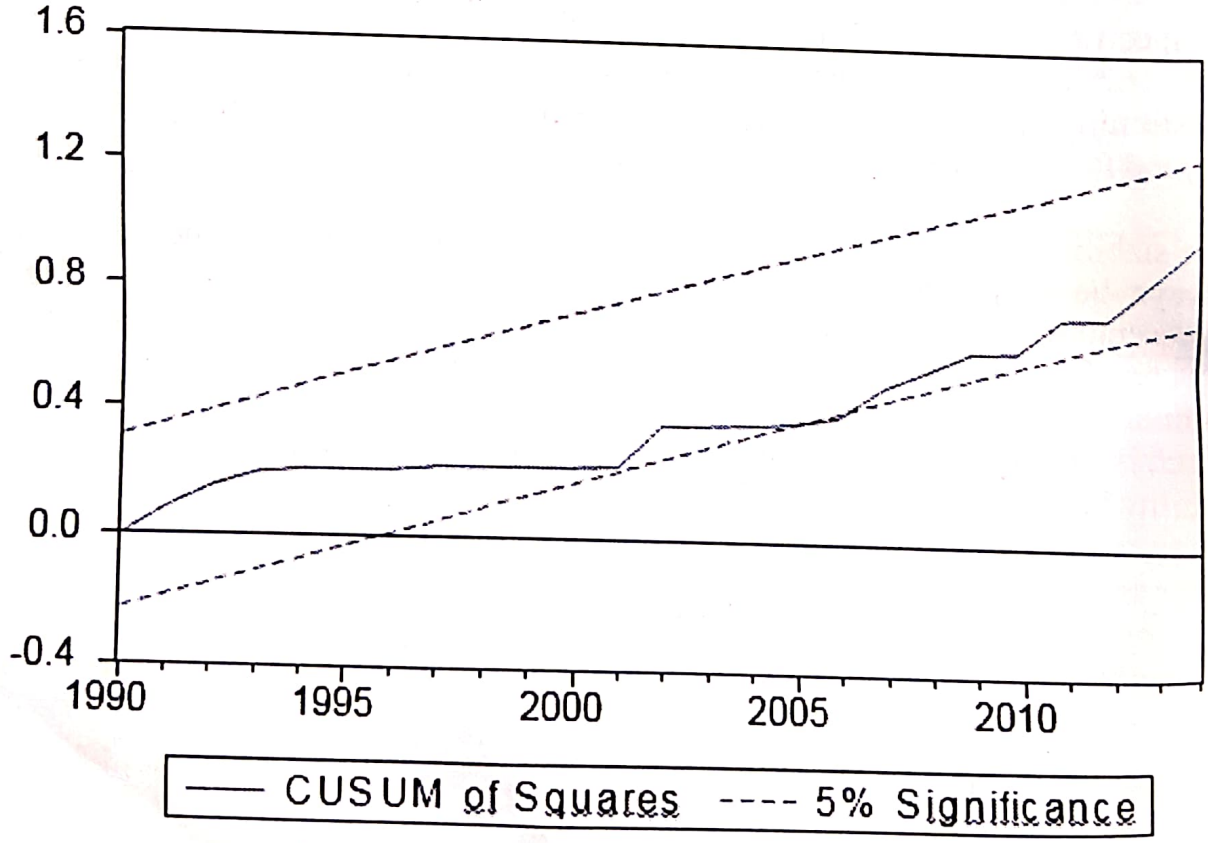
The result shows that fiscal deficit variable is significant at 5% level. The result shows that 1% increase in fiscal deficit leads to approximately 2.0345% depreciation of exchange rate. All other variables are all significant except the degree of openness.

On the short run representation, only the coefficient of changes fiscal deficit is significant at 5 percent with negative sign implying that changes in fiscal deficit has significant negative effect on changes exchange rate depreciation for the period studied. That is, operating fiscal deficit is not a major cause of exchange rate depreciation contrary to apriori expectation. This is contrary to previous study given by Rodriguez's hypothesis (1989). Also, external debt stocks have negative impact on exchange rate depreciation but this was not significant. The GDP coefficient was properly signed as expected but not significant. Coefficient of growth in broad money supply was properly signed but not significant at 5 percent. However, it was significant at 12 percent level. Only 45 percent of systematic variation in the value of changes in exchange rate depreciation was accounted for by changes in the series of attendant explanatory variables utilized. The coefficient of the ECM was found to have the right sign (being negative), large in magnitude and also highly significant. Conceptually, a significant error term with right sign indicates a feedback effect of any deviation exchange rate depreciation from its long run (or equilibrium) steady path thus suggest that any perturbation or disequilibrium will automatically adjust back to the long run equilibrium wholly at a high speed of 32.5 percent in each period sampled. The regression for the underlying ARDL fits very well at R^2 of 79 percent. The overall model is highly significant and there is no residual serial correlation which suggests that the model could fit for any policy formulation agenda. The model also passes the diagnostic tests against serial correlation, functional form misspecification and non-normal errors (Table 6). It failed the heteroscedasticity test at 5%. This confirms Shrestha et al. (2005) that since the time series constituting the ARDL equation are potentially of mixed order of integration, i.e., I(0) and I(1), it is natural to detect heteroscedasticity.

The stability of the estimated coefficient of the error correction model should always be graphically investigated (Pesaran and Shin, 1999). A graphical representation of the Cumulative Sum (CUSUM) and the Cumulative Sum of Square (CUSUMSQ) of the Recursive Residual are also established. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) plots which is shown in Figure 1 from a recursive estimation of the model also indicate stability in the coefficients over the sample period.

Fig 1: Stability Test





Policy Implications of Results

- The first implication of the result of this study is that it shows existence of cointegration. This means that there was a long run stable relationship among exchange rate depreciation, and fiscal deficit, government external debt, degree of openness, growth rate of gross domestic product and broad money supply are stationary.
- The second implication of our finding is that the long-run relationship shows that growth of money supply has a very high significant impact on exchange rate depreciation. This conformed to economic theory that exchange rate fluctuation is highly monetary dependent.
- The last policy implication of our result is that operating fiscal deficit is not a major cause of exchange rate depreciation contrary to apriori expectation. This is contrary to previous study given by Rodriguez's hypothesis (1989).

Conclusions and Recommendation

This study examined the quantitative effects of fiscal deficit on exchange rate movement. The investigation was an attempt to see how persistent fiscal policy operations or management in Nigeria, over the years have interacted with expectation, capital flow and thus fluctuations in exchange rate. Our findings was that, for the periods studied, by incorporating some channeled variables such as government external debt, degree of openness, growth rate of gross domestic product and broad money supply, exchange rate depreciation has a long run stable relationship with fiscal deficits. But, this relationship is not as such (expected) that lead to exchange rate depreciation. Essentially, we discovered that fiscal deficit is not the cause of persistent depreciation of exchange rate since the adoption of SAP and liberalization of trade in 1980s. So, other factors or macroeconomic (e.g., monetary) policy operations could possibly have been the cause of exchange rate depreciation. Also, for the short run dynamics, the impact was still pronounced and significant.

The study recommend that in other to attain both internal and external balance in pursuance of objective of fiscal policy, rightful fiscal management devoid of political interests should be conducted bearing in mind the severe adverse effect it has on exchange rate and consequently trade position of the economy. We recommend that there should also be reduction in deficits through increase in tax. This is because increase taxes tend to weaken the exchange rate of countries with good records on inflation and debt while deficit reduction through spending cuts tends to strengthen the exchange rate of countries with poor records on inflation and debt. And since budget deficit reduction has both direct and indirect effects on the demand for funds, which lead to different effects on the exchange rate. Deficit reduction can lead to a weaker exchange rate by reducing the demand for funds by the government.

Endnotes

Fiscal deficit arises when the outlay of a government exceeds its tax revenues. This implies that the government is running a budget deficit. If the government is running a budget deficit, it has to borrow through the issue of government debt as treasury bills and long-term government bonds.

[2] The bound test approach for the cointegrating long-run relationship between the is based on the Wald test (F statistic) by imposing restrictions on the long-run estimated coefficients of one period lagged level of the exchange rate and fiscal deficits to be equal to zero, that is, the null hypothesis of no cointegration states that is tested against the alternative hypothesis of Then the calculated F-statistic is compared to the tabulated critical value in Pesaran (2001). The F-statistic tests the joint null hypothesis that the coefficients of the lagged level variables are zero (i.e. no long-run relationship exists between them). Therefore, the decision rule is that if computed F-statistic falls below the lower bound value, I(0), the null hypothesis (no cointegration) cannot be rejected. Contrarily, if the computed F-statistic exceeds the upper bound value, I(1) then it can be concluded that exchange rate depreciation and fiscal attendant variables are cointegrated.

[3] This study relies on historical quantitative time series data spanning from 1990Q1 to 2010Q4 which are available in secondary forms and are *sourced* from the statistical bulletin of the *CBN,* Annual bureau of statistics.

[4] Notes: Critical values are extracted from Narayan (2005); Unrestricted Intercept and No Trend (Case III)

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