Exchange rate depreciation and government policy is Nigeria: an empirical evidence

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Abstract
The study examines exchange rate depreciation and government polices in Nigeria. Government policy of the early 1980 that led to 'gradual depreciation' of the naira exchange rate was to encouraged exports and reduces the high import dependence of the economy. The situation seems, however, to be out of control. The actual consequences have turn out to be a nightmare: it resulted to structural imbalances in the system, depleting external reserves; unfavourable balance of payments; high inflation rate; low capacity utilization; increase imports and low rate of the naira. In an effort to contain these abnormalities, the government has adopted different exchange rate regimes and pricing methods yet the naira continues to depreciate. This study is aimed at determining among a set of possible factors and the major determinants of exchange rate depreciation in Nigeria. Some of these factors that have played major impact in exchange rate depreciation include: government policy; the external sector and macroeconomic performance, but this paper has been narrow down to government policy. The study uses the method of regression analysis with Ordinary Least Squares (OLS) econometric technique and a time series secondary data from 1980 – 2011. . The data was first examined for unit roots using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests. A co-integration regression was then used to examine the long run relationship among the variables. The short-run Vector Error Correction (VEC) model was also used to determine the speed of the adjustment to equilibrium. It was empirically shown that, there is significant relationship between government fiscal and monetary policies and exchange rate depreciation. The results further revealed high explanatory power of the coefficient of multiple determination (R^2) and the overall model was significant. Hence, government can curtail the naira depreciation by adopting a flexible exchange rate regime, reducing external trade imbalances and checking the performance of some macroeconomic variables.

1.1 Introduction
Exchange rate like other economic variables, for example, interest rate, inflation rate, unemployment rate, money supply, etc. is a strong economic indicator for assessing the overall performance of an economy. It is one of the macroeconomic variables that reflects the strength and weakness of an economy. As a potent monetary tool, exchange rate is used in achieving certain economic objectives, the common objective, according to Obadan (1992) is to equilibrate the balance of payments, but in Nigeria, the major objective of the exchange rate policy is how to

have a realistic exchange rate, put differently, an effective or equilibrium exchange rate (Obaseki, 1991).

Equilibrium exchange rate can be said to be the real rate, which promotes the achievement of external balance in a manner that is consistent with other targets of economic policy (Olisadebe, 1991). It is a rate, which would remove the existing distortions and disequilibrium in the external sector of the economy as well as ease the persistent balance of payments problem in Nigeria. Exchange rate instability can have a serious adverse effect on price, investment and international trade decisions. Similarly, a realistic exchange rate is one that reflects the strength of foreign exchange inflow and outflow, the stock of reserves as well as ensuring equilibrium in the balance of payments.

Exchange rate policy has been a significant instrument for macroeconomic management in Nigeria as it has been frequently applied in the past to preserve the value of the naira, maintain a comfortable external reserves position and ensure price stability. In the past different exchange rate policies have been used depending on the conditions of the economy at that period and sometimes in response to the changing exchange rate policies with the rest of the world. Often these policies are directed largely at efforts to restrict or ration the use of foreign exchange at officially determined rates, but recent policy shifts have reflected a move towards market- determined exchange rate (Ojo, 1998).

Exchange rate determination varies from country to country and from one period to another. Nigeria has witnessed frequent shifts in the exchange rate policies for the past three decades. In a market friendly economy, the exchange rate is market determined, that is, through response to the forces of demand and supply of foreign exchange (Ojo, 1997, Anifowose, (1997), sometimes in Nigeria exchange rate is determined through administrative fiat, that is, by fixing the rate to one or more convertible currencies without regard to the appropriate market value of the home currency. Between the two extreme cases of exchange rate determination, there is a dual exchange rate system, an admixture of both regimes of fixed and market determined exchange rates system where different rates are applied for different transactions. In a sense, exchange rate determination is influenced by the type of exchange rate regime being adopted (Asinya, 2004). For example, the Nigerian foreign exchange market in the 1990s was made up of three segments: the official foreign exchange market; the autonomous market (i.e. interbank and bureau de change), and the parallel market. The various segments of the market evolved overtime and emerged due to development in the economic and regime's priority.

1.2 Historical antecedence of exchange rate administration in Nigeria

Prior to 1971 Nigeria operated a fixed exchange rate system, following the Breton Wood Agreement Nigeria's exchange rate was kept constant at #1 = $0.40   irrespective of the development within the domestic or external sector of the economy. However, during the 1970s, unprecedented changes occurred in the international financial system, such that intransigent high rate of both inflation and unemployment compounded by low productivity and instability in the industrialized countries to change their exchange rate policies, thus, the early 1970s witnessed the advent of the floating rate system. In 1972-1974, the monetary authority, Central Bank of Nigeria (CBN), opted to peg the naira to U.S. Dollar even though most of Nigeria's trading partners allowed their currencies to float and stabilize at a realistic level. Shortly after the naira was pegged to the U.S. Dollar, the dollar was devalued by 10 per cent in order to

stimulate the U.S. exports. This action inadvertently caused a devaluation of the naira by the same percentage, hence the exchange rate of U.S. $1.52 to the naira emerged, and the floating system was discontinued giving way to a system of pegging the naira to a basket of currencies. The period coincided with the oil boom era and Nigeria therefore adopted a policy that led to progressive depreciation of the naira from #1.00 = $0.65 in 1974 to #1.00 = $1.85 in 1981, despite the growing deficits in the non-oil current account and the prevalent international inflation. This situation was exacerbated by the pursuit of policies designed to keep consumer prices low even in an era of rising world inflation. As a result of this policy, the naira became over valued in real terms and the policy of industrialization through import-substitution was translated to one of high proportion of imported input needed for such unit of output (Onwioduokit and Nwachukwu, 1998). The slum in the world oil market in 1991, coupled with the emergence of large deficit on current account made it unwise to continue the policy that led to the appreciation of the naira. Consequently, the monetary authorities began a policy that led to the depreciation of the naira while it systematized the policy of exchange control through the use of comprehensive import licensing scheme as well as outright prohibition of some goods. This depreciation led to distortions in the system and it is the fulcrum of this paper.

The depreciation of the naira has several implications for economic development in Nigeria. First, the argument that, the depreciation of the naira would stem imports since the increase costs arising there from would discourage importers is faulty because the economy is heavily import dependent, the propensity to import is very high in Nigeria today, thus the imports are price inelastic. Secondly, it was argued that, depreciation usually make export products cheap or at least competitive in the international market, thus enhancing demand. This argument did not take into account two important factors: the elasticity of demand for the export and the pricing pattern. The reality that emerged shows that Nigeria export products are essentially inelastic and the prices of the export products are fixed by the international market and are not positively correlated to changes in the naira exchange rate. Other adverse effects of depreciation include: unemployment, lack of direct foreign private investments, increased external debts, balance of payments disequilibrium and low per capita income. It also undermined the international competitiveness of non-oil export, making planning and projections difficult at both micro and macro levels. In addition business capacity utilization in Nigeria became low up to 40 per cent with accumulated inventories while a number of small and medium scale enterprises were strangulated as a result of the low dollar/naira exchange rate.

In a continuous search of a realistic exchange rate, the Second- Tier Foreign Exchange Market (SFEM), the Autonomous Foreign Exchange Market (AFEM), Inter-bank Foreign Market (IFEM), Dutch Auction System (DAS), and the Bureau de Change was established essentially to provide an institutional framework through which a realistic market determined exchange rate could evolved. In sum, SFEM was expected to make foreign exchange management in Nigeria more efficient and less costly to administer, but the operation of this market led to a huge devaluation of the naira such that from an exchange rate of #1.55355 to the dollar in 1986, the naira depreciated by 71 per cent to #5.3530 to $1.00 at the last bidding session in 1988. On the average, the naira was depreciated to #0.6702, #0.7486 and #0.8083 to the United State dollar in 1982, 1983, and 1985 respectively. As the situation became increasingly critical the pace of depreciation increased in 1986 when the currency average #3.9696 and #19.4966 per dollar in 1992. The most significant depreciation occurred in the last quarter of 1986 as a result of the adoption of SFEM. In 1993, the average official exchange rate stood at about #21.8861 to $1.000.

However, between the first forex action in 1986 and 1994, the exchange rate depreciated by about 93 per cent. The rates were however, fixed by administrative fiat at #21.8888 to a $1.00 from 1993 to 1999. Immediately after the pegging of the naira to the US dollar, the depreciation became uncontrollable. It depreciated to #103.1052, #120.9702, and #133.5004 in 2002, 2003 2004 respectively.

Inspire of the various reforms to the foreign exchange market, the unabated and unidirectional depreciation of the naira against other currency continue to give cause of concern to monetary authorities and end-users of foreign exchange. While some economists attributed the naira depreciation to wrong policies implementation occasioned by lack of harmony between monetary and fiscal policies, others are of the views that, movement in the external sector and the macroeconomic performance constitute the driving force behind the persistent depreciation.

This paper therefore examines the extent to which government policy affects exchange rate depreciation. The paper is structured as followed. After the introduction, section 2 presents the theoretical framework and literature review. Section 3 shows the working data, model specification and the methodology. Section 4 analyzes the empirical results. Finally, section 5 includes the conclusion and suggests solutions for policy makers.

2.1 The theoretical framework and literature review
Generally, there are three main theoretical foundations of exchange rate determination. These include: the traditional flow model; the port-folio balance model; and the monetary model as well as the purchasing power parity model, which is a sub-set of the monetary model (Obaseki and Bello, 1996).

2.1.1 The traditional flow model
The theory states that, exchange rate is determined simply by the forces of supply and demand of foreign exchange. The exchange rate is in equilibrium when supply equates demand. The current account imbalance is offset by the net flow of capital in the opposite direction. A current account surplus is financed by acquisition of financial assets abroad or outflow of capital. Similarly, a deficit is financed by an inflow of capital. The current account is assumes to be determined by changes in relative prices and real income. Increases in domestic prices relative to foreign prices leads to exchange rate depreciation. This is because increase in the domestic price level feed into costs thereby making exports costly and highly competitive. Consequently, the supply of foreign exchange is constrained. Imports on the other hand increase since the inflation- ridden economy is a more profitable place to export. If imports are very inelastic, import payments increase thereby increasing the demand for foreign exchange.

According to the model exchange rate is determined by three factors: the relative price, income and relative interest rate. This can be related as;

$$EXCHR = f\,(p/pf,\ y,\ r/rf) \qquad\qquad (1)$$
$$EXCHR = \lambda_0 + \lambda_1 p_1 + \lambda_2 y_2 + \lambda_3 r_3 + \mu_1 \qquad\qquad (2)$$
$$EXCHR = \lambda_0 + \lambda_1 p_1 + \lambda_2 y_2 + \lambda_3 r_3 \qquad\qquad (3)$$
$$<0 \quad\quad <0 \quad\quad >0$$

Where; p = domestic price, pf is foreign price, y = real income, r = domestic interest rate and rf = foreign interest rate.

The equation (3) posits that an increase in domestic interest rate relative to the foreign interest rate causes an appreciation of the exchange rate through induced capital inflow. Therefore, a country that intends to strengthen its exchange rate must raise interest rate, lower prices and reduce real growth. An increase in real income will lead to increase in the demand of imported commodity, which will lead to exchange rate depreciation. Equally, an increase in domestic price relative to foreign prices brings a negative effect on the exchange rate. The domestic goods will be more expensive relative to foreign goods; this will lead to an increase in import and finally lead to disequilibrium in exchange rate. The problem of this model is that it ignores the relevance of the asset market and it does not take into consideration the total money supply or the demand and supply of money.

2.1.2 The monetary model

The monetary model tries to explain changes in exchange rate in terms of changes in the demand for and supply of money between two countries. The factors that determine exchange rate, according to the model include money supply, real income, and interest rate.
Thus:

$$EXCHR = f\,(Ms,\, y,\, r) \qquad\qquad (4)$$
$$EXCHR = \beta_0 + \beta_1 p_1 + \beta_2 y_2 + \beta_3 r_3 + \mu_1 \qquad\qquad (5)$$
$$EXCHR = \beta_0 + \beta_1 p_1 + \beta_2 y_2 + \beta_3 r_3 \qquad\qquad (6)$$
$$<0 \quad >0 \quad <0$$

Where: EXCHR = Exchange rate, Ms = Money supply, y = real income, r = interest rate.

According to the model (6) increase in money supply causes the exchange rate to depreciate as a result of inflationary pressure it generates. An increase in the real income with fixed nominal money supply causes prices to change leading to an appreciation of the exchange rate. While an increase in domestic interest rate lowers money demand raises prices (with a given stock of money) the increase in prices leads to the depreciation of the exchange rate.

From what we have discussed so far, it can be deduced that, the traditional flow model and the monetary model specify the same factors affecting the exchange rate; the results are in the opposite directions. The traditional flow model predicts that increase in interest rate leads to exchange rate appreciation but it causes the exchange rate to depreciate in the monetary model. Similarly, increase in real income causes depreciation of the exchange rate in the traditional flow model but the exchange rate appreciates when real income is increased in the monetary model.
One of the criticisms of the monetary model is the assumption that domestic and foreign bonds are perfect substitutes. If two assets are not perfect substitutes, then account must be taken of the differences in their prices and yields. Another criticism is that it does not seem to make distinction with the different assets (domestic and foreign currencies).

2.1.3 The port-folio balance model

The port-folio balance model assumes that residents distribute their wealth among three forms of assets namely: monetary base, domestic bonds and foreign bonds. The exchange rate is in equilibrium when the holdings of these assets are in their desired proportion.
Thus:

$$W = f\,(MB,\, DB,\, FB) \qquad\qquad (7)$$
$$W = \alpha_0 + \alpha_1 MB_1 + \alpha_2 DB_2 + \alpha_3 FB_3 + \mu_1 \qquad\qquad (8)$$
$$W = \alpha_0 + \alpha_1 MB_1 + \alpha_2 DB_2 + \alpha_3 FB_3 \qquad\qquad (9)$$
$$<0 \quad\quad >0 \quad\quad >0$$

Where: W= wealth, MB = Money base, DB = Domestic bonds, FB = Foreign bonds.

The model (9) states that, an increase in domestic wealth may arise either from increase in monetary base, holdings from government bonds or from the current account surplus. An increase in wealth increases the demand for foreign bonds or assets leading to a depreciation of the exchange rate as a result of capital outflow so generated. However, an increase in private sector holding of government bonds drive bond prices down and raises interest rate. This causes an appreciation of the exchange rate. Thus, an increase in domestic government bonds has an uncertain effect on the exchange rate. The exchange rate may appreciate or depreciate, depending on the relative strength of the substitution and income effects. The exchange rate will appreciate if the substitution effect is stronger. On the other hand, it will depreciate if it is weaker than the income effect. An increase in the foreign bonds will lead to capital flight, thereby increasing the demand for foreign exchange. Consequently, it will lead to depreciation in the exchange rate. A major criticism of the asset-disturbance model is that it ignores the fundamental determinants of trade, the role of expectations as well as the role of purchasing power parity (PPP).

The concept of purchasing power parity (PPP) is straightforward. It is an important assumption in some version of the monetary and port-folio balance models but not in the Keynesian/Dombusch models. The theory was propounded by a Swedish economist, named Gustar Cassel in 1920. The theory essentially represents a synthesis of the work of the nineteenth century economists like Ricardo, Wheatley and Thornton, etc. The theory suggests that we should be able to buy the same bundle of goods in any country for the same amount of currency (or, put slightly differently, people value currencies for what they buy). It states that the equilibrium exchange rate between two inconvertible paper currencies is determined by the equality of their purchasing powers. The fundamental notion of the PPP theory is that, the exchange rate depends upon the relative prices levels and not the other way round. The implication is that with every change in the price level, the exchange rate also changes.

The theory attempts to explain the equilibrium value of the exchange rate in terms of differences in inflation rate between two countries. It assumes that exchange rate of currencies of two countries move in a manner that seeks to offset the inflation differential between the economies thereby maintaining, the real purchasing power of either currency in the other economy

2.2 Literature review

The fiscal action of government and the concomitant actions of the monetary authority through its monetary policy (tight and expansionary) and the reactions from the economic agents have profound effects on the stability of the exchange rate. According to Nnanna (2000), exchange rate performance can be attributed to the repercussion of various shocks, consequent on changes in external reserves for the purpose of fiscal adjustment, domestic shocks, such as liquidity, domestic prices and other financial shocks associated with monetary instruments. Anyanwu (1997) observed that gradual and timely devaluation with adequate fiscal management could have been the key ingredient of macro-stability, but over-emphasis on exchange rate auctions and the inter-bank market as a means of ensuring continued flexibility has resulted to exchange rate depreciation. He argued that U.S. dollar, which is the most widely traded currency, is subjected to gyrations commonly unrelated to fundamentals. How, therefore, can the naira that uses the dollar as a base, resist similar instability?

Owolabi (1992) and Obaseki and Bello (1996) advised that, to reduce or eliminate the over-valuation of the naira, the inflation rate should be brought down through fiscal and monetary restraint and the application of appropriate supply increasing measures. Owolabi (1992) went further to state that, although the market driven exchange rate has succeeded in removing the problems of over-valuation, he argued that, problem of over-valuation is as a result of over-liquidity in the system resulting from expansionary fiscal and monetary developments, and the indiscipline of some speculative market operators.

Finally, to achieve a sustainable stability in the exchange rate, Olisadebe (1991) asserted that stability does not imply fixing the exchange rate but the rate should be allowed to vary in a manner that should further the achievement of other macro economic objectives. Anyanwu (1992), supports that, an emphasis on sustainability implies a preference for a variance of limits which the exchange rate should move. Owolabi (1992) and Obaseki and Bello(1996) advised that, to reduce or eliminate the over-valuation of the naira, the inflation rate should be brought down through fiscal and monetary restrain and the application of appropriate supply increasing measures.

Please (1992) argued that an exchange rate policy for achieving structural transformation and longtime development is very unlikely to find a simple market determined rate adequate, particularly for a country like Nigeria, which is an enclave sector receiving large windfalls in Forex receipts from oil. Anyanwu et al, 1997, Ojinnaka, 2000:51; Obadam, 1993, Mulfwang, 1999, Onwoduokit and Nwachukwu, 1998 confirmed that the availability of foreign exchange earnings from oil sector provided a "false sense" of economic well-being as well as an artificial blur of the underlying structural distortions. This shows that, the continuous reliance on oil revenue for determination or stability in the naira exchange rate is grossly unfounded because the oil prices are subject to external shocks, and are determine by OPEC

3.1 Model specification

In specifying our model, we are guided by the theoretical consideration as well as empirical evidence in the Nigerian economy. Thus, the model states that, exchange rate depreciation is a function of fiscal deficit, lagged fiscal deficit for one year, interest rate, money supply and lagged money supply for one year. This can be reduced to:

$$EXCHR = f (FDI, FDI (-1), INTR, Ms. Ms (-1). \qquad . \qquad\qquad (10)$$

$$EXCHR = \delta_0 + \delta_1 LFD_1 + \delta_2 LFD (-1)_2 + \delta_3 INTR_3 + \delta_4 LMs_4 + \delta_5 Ms (-1)_5 + \mu_1. \qquad (11)$$

$$EXCHR = \delta_0 + \delta_1 LFD_1 + \delta_2 LFD (-1)_2 + \delta_3 INTR_3 + \delta_4 LMs_4 + \delta_5 Ms (-1)_5. + ECM (-1) (12)$$

$$\quad <0 \qquad <0 \qquad <0 \qquad <0 \qquad <0$$

Where: EXCHR = Exchange rate, LFD = Log of fiscal deficit, LFD (-1) = Log of lagged fiscal deficit, INTR = Interest rate, LMs = Money supply and LMs (-1) = Log of lagged money supply. ECM (-1) = Error Correction Model. δ_0 = constant term, $\delta_{1 - \delta 5}$ = parameter to be estimated, μ_1 = stochastic error term.

The analysis of exchange rate depreciation and government policy in Nigeria is based on thirty two year data series (1980 - 2011) compiled from Annul reports; Central Bank of Nigeria (CBN) various issues; National Bureau of Statistics; and Statistical Bulletin.

This study adopted the Ordinary Least Squares (OLS) econometric technique. Before estimation the stationarity of the variables were examined. Hence, a co-integration technique, and the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) tests were used to test for the order of integration. We assumed a linear relationship between the dependent variable and the independent variables in the specified equation. This was done to avoid the generation of spurious results.

4.1 Analysis of results

The results are displayed in appendix, in table 4.1 all the residuals are found to be stationary which confirms the existence of long run co-integrating relationship between the independent and the dependent variables.

In table 4.2 the result shows that, the constant term came out with a wrong sign, which does not conform to the required criteria. Hence, if all other factors are held constant, exchange rate will depreciate by 4.938480 per cent. All the independent variables do conform to the economic expectations except lagged money supply. The Error Correction Model (ECM) here has the correct sign and it is statistically significant at 5 per cent level. The co-efficient of the ECM is -0.634974 confirming stability in the adjusting process. The speed of adjustment is very high indicating that a deviation in exchange rate from the equilibrium rate is corrected by 63 per cent the following year. The coefficient of multiple determinations (R^2) of 0.90 per cent variation in the observed behaviour of the dependent variable is jointly explained by the independent variables. The remaining insignificant per cent of 0.09 is captured by the stochastic error term. The high R^2 indicates that there is a good fit in the model. The F-statistic of 55.47863 is significant at 5 per cent level; this goes to strengthen the authenticity and significance of the high R^2. The t-statistic shows that, fiscal deficit, money supply and lagged money supply are statistically significant at 5 per cent level while other variables are not statistically stabled. The Durbin-Watson statistic indicates that, the value of 2.228681 falls within the region of no autocorrelation. Hence, the result of this estimation could be used for predictive purposes. The result further shows that; fiscal deficit and lagged fiscal deficit for one year have a strong influence on exchange rate depreciation. Over the years, government fiscal deficit has increase tremendously; this is due to extra budgeting allocation and frivolous spending by politicians. Fiscal deficit is an offshoot of government excessive spending. When this situation occurs there is a fall in the value of the country's currency (depreciation). The estimated co-efficient for these two variables were statically significant at 5 per cent level.

Equally, interest rate has negative impacts and the co-efficient is statically significant, this supports Keynes transmission mechanism that and increase in interest rate will lead to a fall in investment, consequently, the fall in investment could lead to structural imbalances which includes; exchange rate depreciation. The negative relationship between interest rate and exchange rate in the Nigerian case adhered to the monetary model. In the model, increase in interest rate lowers money demand, raises prices – the increase in prices lead to depreciation of the exchange rate, contrarily, the traditional flow model using the relative interest rate posits that "an increase in domestic interest rate relatives to foreign interest rate causes an appreciation of the exchange inflow",. However, this paper supported the monetary model of exchange rate. From the foregoing discussion and the empirical investigation carried out, it shows that, fiscal and monetary policies contribute significantly on exchange rate depreciation. Nnanna, (2002)

concluded that, movements in the exchange rate since inception of the market – determined exchange rate management system have been influenced by monetary and fiscal conditions.

5.1 Conclusion

Exchange rate depreciation is a complicated problem in the Nigerian economy. So far we have been able to narrow some of these problems of exchange rate depreciation to monetary and fiscal policies of the government, and the results have testified that money supply, fiscal deficit and interest rate are in fact the major determinants of exchange rate depreciation. To salvage the exchange rate through government policy, these factors mentioned above should be a focal point for consideration. Furthermore, to enable exchange rate to appreciate, interest rate should permanently be uncapped. This will help to mobilize savings, reduce speculative fever and narrow the interest rate differential between Nigerian and the rest of the world. One of the central issues or factors that have affected the rate of exchange is the fiscal indiscipline of the government, which adversely affects the fiscal deficits. We, therefore, recommend a tight fiscal policy, fiscal discipline and fiscal transparency. This ordinarily entails moderate interest rate, high taxes on some goods, lower government spending, etc. this must of course be complimented and sustained by tight monetary policy.

References

Anifowose, O. K. (1997). Management of foreign exchange: A peep into the next decade. *CBN Bullion,* 21 (4).

Anyanwu, J. C. (1997). The structure of Nigerian economy (1960 – 1997). Onistsha: Joanee Education Publishing Limited.

Asinya, F. A. (2004). Determinants of exchange rate depreciation and macroeconmic management in Nigeria. Unpublished M.sc project-University of Calabar.

Central Bank of Nigeria (1991). Nigeria's exchange rate policy. *CBN Research Department.*

Imimole, B. and Emma, A. (2011). Exchange rate depreciation and inflation in Nigeria (1986 - 2008). Business and Economic Journal.

Koutsoyiannis, A. (1985). Theory of Econometrics (2nd edition). London: Macmillan.

Mulfwang, P. M. (1999). The state, oil and socioeconomic transformation in Migeria. An Aritical appraisal. A Pengassan – NNPC publication, Lagos

Nnanna, O. J. (2002). Monetary policy and exchange rate stability in Nigeria. Proceedings of a one-day seminar by *Nigeria Economic Society*, Lagos.

Obadan, M. I (1992). Nigeria's exchange rate policy management.
    NCEMA paper, Series 5.

Obaseki, P. J. (1991). Foreign exchange management in Nigeria, past, present and the future. A paper presented at a seminar for staff of *CBN Research Department*, Lagos.

Ojinnaka, I. P. (2000). Development in the petroleum sub-sector and their impacts on the Nigerian economy. CBN Bullion. (24)3

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

Ojo, M. O. (1992). Exchange rates development in Nigeria. A historical perspective. Ijeba-Ode. Nigeria: *UNILAG consult.*

Onwioduokit, E. A. & Nwachukwu, N. E. (1998). Sectorial response to exchange rate policy in Nigeria: A case study of Agricultural management. *CBN Bullion* (2)2

Appendices
Table 4.1 Unit Root Test using ADF and PP

Variable	ADF Level	First Difference	PP Level	First Difference	Decision
ΔLFD	-1.406223	-9.121011*	-0.329011	-7.446812***	1(1)
ΔLFD(-1)	-1.261181	-3.531891***	-1.431461	-6.3842112**	1(1)
INTR	-0.8476694	-5.116842***	0.704224	-8.741823**	1(1)
ΔLMS2	-5.816684	-2.146112**	-4.821452	-2.586921*	1(0)
ΔLMS2)(-1)	-8.3214112	-1.542131**	-3.993211	-.2.734561**	1(0)

Note: * Significant at 1%, ** Significant at 5%, *** Significant at 10%

Table 4, 2 Error Correction Model for Exchange Rate Equation

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Dependent variable: EXCHR
Method: Least Square
Date: 03/11/13   Time: 16:15
Sample(adjusted): 1980 2011

Including observations: 32 after adjusting endpoints
Variable          Coefficient   Std. Error    t-Statistic    Prob.
C                 -4.938480     9.358036      -0.527726      0.6030
LOGFD             -7.70E-05     4.90E-05      1.570932       0.1305
LOGFD(-1)         -0.000208     5.21E-05      -3.986962      0.0006
INTR              -0.467310     0.614745      0.760168       0.4552
LOGMS2            -7.85E-05     1.60E-05      4.895181       0.0001
LOGMS2(-1)        0.000140      2.44E-05      5.729639       0.0000
EECM(-1)          -0.634974     0.265722      -0.754369      0.0001
R-squared         0.926518      Mean dependent var          50.36722
Adjusted R-squared 0.909818     S.D. dependent var          55.15957
S.E. of regression 16.56463     Akaike info criterion       8.639826
Sum squared resid 6036.516      Schwarz criterion           8.925299
Log likelihood    -114.9576     F-statistic                 55.47863
Durbin-Watson stat 2.228681     Prob(F-statistic)           0.000000
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