European Journal of Accounting, Auditing and Finance Research
Vol.4, No.4, pp.56-64, April 2016
Published by European Centre for Research Training and Development UK (www.eajournals.org)

THE EFFECT OF VARIATIONS IN FOREIGN EXCHANGE ON FINANCIAL DEPTH: EVIDENCE FROM NIGERIA

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ABSTRACT: *This study is an empirical analysis of the effect of variations in foreign exchange on the financial depth of Nigerian economy. Nigeria has seen about fifteen distinct foreign exchange variation incidences from 1962 to date with diverse effects on the economy of the nation in general and financial depth in particular. In line with the objectives of this study, secondary data were obtained from Central Bank of Nigeria Statistical Bulletin covering the period of 1985 to 2015. The ordinary least square multiple regression analytical method was used for the data analysis. Some statistical tools were employed to test the statistical significance of the variables. The analysis started with the test of stationarity of the Nigeria's time series data. The empirical study found that the data were not stationary and then employed the Dicky Fuller (ADF) test statistic to make it stationary. Hence the OLS regression was applied to the data to determine the overall effect of variations in foreign exchange on the financial depth of the economy. The multiple regression results revealed that the variations in foreign exchange in Nigeria have not had the anticipated positive effect on the depth of the Nigerian financial sector. This implies that the Nigerian economy has been remarkably unsuccessful in experiencing constant exchange rate which is capable of attracting foreign investment. Hence, our findings suggest a stable exchange rate regime and an enhanced loan policy to maximize good economic performance. To reap the benefits of stable exchange rate, this study recommends that the Nigerian government should be conscious of over-dependence on oil and promote increased production in the non-oil sector of the economy by creating a level-playing field for private sector led activity.*

KEYWORDS: Financial Depth, Foreign Exchange Variation, OLS, Stationarity, Dicky Fuller.

INTRODUCTION

Financial deepening generally means an increased ratio of money supply to GDP or some price index. It refers to the increased provision of financial services with a wider choice of services geared to all levels of the society. While foreign exchange is a means of settlement of international transactions. It is also a 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 stability of the exchange rate system has been recently one of the challenging bedrock of all economic activities. The key purpose most countries engaged in exchange rate reform is because of the economic costs that exchange rate volatility can bring to an economy.

The history of exchange rate systems in Nigeria was dated back then in early 1960. Foreign exchange was earned then by private sector and held in equilibriums by commercial banks in overseas that acted as agents for local exporters before the establishment of the Central Bank of Nigeria in 1958 and the enactment of the Exchange Control Act of 1962. The oil boom experienced in the 1970s made it necessary to manage foreign exchange rate in order

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

to avoid shortage. However, shortages in the late 1970s and the early 1980s compelled the government to introduce some ad hoc measures to control excessive demand for foreign exchange. However, it was not until 1982 that a comprehensive exchange controls were applied. Then a fixed exchange rate system was in practice. The increasing demand for foreign exchange and the inability of the exchange control system to develop an appropriate mechanism for foreign exchange allocation in consonance with the goal of internal balance made it to be discarded in 1986 while a new mechanism was evolved under the Structural Adjustment Programmes (SAP). The main objectives of exchange rate policy under the Structural Adjustment Programmes were to preserve the value of the domestic currency, maintain a favourable external balance and the overall goal of macroeconomic stability and to determine a realistic exchange rate for the Naira.

In an attempt to achieve this, a transitory dual exchange rate system (First and Second –Tier – SFEM) was adopted in 1986, but metamorphosed into the Foreign Exchange Market (FEM) in 1987. Bureau de change was introduced in 1989 with a view to enlarging the scope of FEM. In 1994, there was a policy reversal, occasioned by the non-relenting pressure on the foreign exchange market. Further reforms such as the formal pegging of the Naira exchange rate, the centralization of foreign exchange in the CBN, the restriction of Bureau de change to buy foreign exchange as an agent of CBN etc. were all introduced in the foreign Exchange Market in 1994 as a result of the volatility in exchange rate. Still, there was another policy reversal in 1995 to that of "guided deregulation". This necessitated the institution of the Autonomous Foreign Exchange Market (AFEM) which later metamorphosed into a daily; two ways quote Inter-Bank Foreign Exchange Market (IFEM) in 1999. The Dutch Auction System was reintroduced in 2002 as a result of the intensification of the demand pressure in the foreign exchange market and the persistence in the depletion of the country's external reverses. Finally, the wholesales Dutch Auction System (W-DAS) was introduced in 2006. The introduction of the WDAS was also to deepen the foreign exchange market in order to evolve a realistic exchange rate of the Naira.

In line with the above, Nigeria has seen about fifteen distinct foreign exchange reform episodes from 1962 to date with diverse effect on the economy of the nation in general and financial depth in particular. This was in consonance with one of the recent World Bank report that financial depth is poor in the emerging market economies. The report gave reasons for these poor performances which include the low level of foreign direct investments, shallow capital market, distortions in interest rate, and weak association between financial openness and financial deepening. It has been observed that empirical literatures that relate to the variations in foreign exchange rate were limited. This is the gap filled by this empirical study and thus justified it. This paper therefore examines the effect of variations in foreign exchange on financial depth: evidence from Nigeria.

CONCEPTUAL ISSUES AND REVIEW OF RELATED LITERATURE

The fact that a fast depreciating local currency can create instability within other macroeconomic variables has necessitated the efforts by the Central Bank, the pivot monetary authority in Nigeria to put in place different measures at stabilizing the local currency. The Central Bank of Nigeria has over the years done a lot in the area of exchange rate and foreign exchange market management with a view to achieving a realistic exchange

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

rate that will aid economic growth and achieve a relative stability in the value of the Naira against the dollar.

Hodrick (1990) shows that the effect of the volatility of foreign exchange on stock market might result from the fact that most quoted companies in developing countries are import dependent and this means a negative implication for the economy in general and the stock market in particular.

Agu (2002) shows that optimal exchange rate policies must be aimed at cooling real exchange rate (RER) that maintain internal and external balance in an economy. Internal balance here is defined in terms of the level of economic activities consistent with satisfactory control of inflation and full employment of resources. External balance on the other hand is defined in term of payment equilibrium, sustainable current account deficit finance in a lasting basis of expected capital flow. Any distribution in the real exchange rate will mostly probably lead to instability in both external and internal balance.

Okafor (2011) asserted that the determination of the monetary authorities to contain persistent depreciation and fluctuations of the naira informed the frequency with which the management techniques were introduced. Numerous variants of market determined exchange rates have been adopted since 1986 in a bid to stabilize the rates as well as ensure a single exchange rate for the naira.

Jayaraman (1996) in his cross-country study on the macroeconomic environment and private investment in six Pacific Island countries observed a statistically significant negative relationship between the variability in the real exchange rate and private investment. Duncan *et al*. (1999) commented that although variability in the real exchange rate is a reasonable proxy for instability in major economic variables as fluctuations in inflation and productivity and more generally in fiscal and monetary management are reflected in the real exchange rate, it is not a good measure of the uncertainty attached to policy or the insecurity of property rights and enforcement of contracts or the level of corruption. Observing that these non-economic factors appear to be very significant influences on investment in the Pacific Island countries, Duncan *et al.* 1999, however, concede that no quantitative or qualitative evidence is available of their size or their impact. In the absence of such evidence, any study on private investment is to be necessarily restricted to the conventional variables.

CBN (2013) noted that the changing pattern of international trade, institutional changes in the economy and structural shifts in production are the chiefly factors that have influenced the development of the Nigeria foreign exchange market.

Serven and Solimano (1992), also investigates economic adjustment and investment performance for 15 developing countries using the pooled cross-section time series data from 1975 to 1988. The investment equation estimated in the study used exchange rate and inflation as proxies for instability, and in each case, instability was measured by the coefficient of the variation of the relevant variables over three years. The two measures were found to be jointly significant in producing negative effect on investment. The same effect was confirmed by Aizenman (1992) study on Exchange Rate Flexibility, Volatility and Domestic and foreign Direct Investment. Unfortunately the literature is still unclear about the direction of effects of exchange rate variability on the pattern and flow of investment. In other words the question of what exchange management strategy a country wishing to

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

encourage flows of investment should adopt is still unclearly resolved in the literature. An important study in this direction is Kosteletou and Liargovas (2000).

Ettah et al (2011) focused on the effects of price and exchange rate fluctuations on Agricultural exports (cocoa) in Nigeria. Data were applied to an export supply function for cocoa specified and estimated using the Ordinary Least Squares Regression. Their results showed that exchange rate fluctuations and agricultural credits positively affect cocoa exports in Nigeria. The results also revealed that relative prices of cocoa are insignificantly related to quantity of export. Hence, their result therefore, implied a positive significant effect of exchange rate volatility on cocoa exports in Nigeria. They recommend that agricultural credit schemes should be restructured in a way that should meet the needs of farmers; and such credit facilities should be made available and accessible to cocoa farmers in order to boost their production capacity while there should be a free market determination of exchange rate for export of cocoa in Nigeria.

Accam (1997) reviews the effect of exchange rate instability on macroeconomic performance with specific reference to its effects on investment and trade. In the survey, he found that unstable macroeconomic environment constitutes one of the major impediments to investment in many LDCs. The authors estimate an OLS regression of the fixed country effects of total and private investment in 20 countries using the standard deviation of the exchange rate as a proxy for instability. The study finds a negative sign associated with the coefficient of exchange rate uncertainty.

Also Ani *et al*. (2013) evaluates the overall effect of foreign exchange reforms on the financial depth of the economy with the aim of determining whether foreign exchange reforms in Nigeria have had the desired positive effect on the depth of the Nigerian financial sector. In the study they found that foreign exchange reforms in Nigeria have not had the desired positive effect on the depth of the Nigerian financial sector. They recommend strong diversification of the Nigerian economy away from the mono-economy and its peculiarities into other non-oil sectors so as to enhance commodities export and reap the benefits of stable exchange rate.

Thomas, (1997) in his study of 86 developing countries examined data on terms of trade, real exchange rates, and property rights and concluded that while factors including credit, availability and the quality of physical and human infrastructure are important influences, uncertainty in the foreign exchange rate was negatively related to private investment in sub-Saharan countries. He employed the variability in real exchange rates as an explanatory variable in regression analysis.

METHODOLOGY

Research design is the structure and strategy for investigating the relationship between the variables of the study. The research was adopted to examine the effect of variations in foreign exchange on financial depth in Nigeria from 1985 to 2015. An ex post facto research design was used for the thirty years study period thus qualifying it as a times series study. According to Asika (2005) who highlighted the importance of an ex post facto research states that it

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

provides a systematic and empirical solution to research problems, by using data which are already in existence.

The variables used in the study and the model specification were based on established theoretical relationships, their use in previous studies and the availability of useable data. The multi-linear relationship specified in the symbolic form below was used to elucidate the effect of variations in foreign exchange on financial depth.

$FIDEPTH_t = f\ (FOREX, CAPMKT, INTRATE)_t$ …….…..…. (1)

Where;

FIDEPTH = Financial Depth
FOREX = Foreign Exchange Rate
CAPMKT = Market Capitalization
INTRATE = Real Interest Rate
f = Functional Relationship

The econometric form of the equation (1) is represented as:

$FIDEPTH_t = \beta_0 + \beta_1 FOREX_t + \beta_2 CAPMKT_t + \beta_3 INR_t + \mu it$……..…..... (2)

The study used annual time series data of 1985 to 2015 sourced from the Central Bank of Nigeria Statistical Bulletin. Data pertaining to the various proxies of financial deepening were equally sourced from Central Bank of Nigeria's statistical bulletin and the apex bank's Annual reports. A total of four variables which include; Financial Depth (FIDEPTH), Foreign Exchange Rate (FOREX), Market Capitalization (CAPMKT) and Real Interest Rate (INTRATE) were used. The dependent variable in this study is financial deepening. According to Mohan (2005), the financial depth of an economy is derived by relating the key macroeconomic indices of financial sector operations to the gross domestic product. The major banking sector aggregates which impact significantly on financial deepening are total banking sector assets (BA), total demand deposits (DD) and total loans and advances (LAD). According to Okafor (2011), the absolute levels of the three aggregates relative to the GDP present very concise measures of financial deepening. Accordingly, bank assets to GDP ratio (BA ratio), bank deposits to GDP ratio (BD ratio) and loans and advances to GDP ratio (BL ratio) were used to proxy financial deepening. While the first metric was used as the primary proxy the subsequent ones were used as robustness checks on the study.

The independent variable (the test variable) in this study is foreign exchange reforms. This was measured as the prevailing exchange rate at year end between the Naira and the US Dollar. The capital market and interest rates variables which are theoretically recognized determinants of financial deepening were also introduced as control variables.

Testing for stationary

A variable was considered non stationary if its calculated value was less than the critical value hence the justification for the existence of a unit root. On the other hand, a variable was considered stationary if its calculated value was higher than the critical value and this confirmed the absence of unit root. Hence, before running the regression analysis, the properties of the time series were checked for unit root problems using the Augmented Dicky Fuller (ADF) test statistic and the result of the test are presented in the table below:

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

Table 1: Analysis of Stationarity Test.

	Test Critical values					
Variable	**1%**	**5%**	**10%**	**ADF**	**Status**	**d(y) ADF**
BA_GDP	-2.332346	-2.444768	-2.687464	-2.134765	1(1)	-5.456378
BD_GDP	-2.453637	-2.498373	-2.543638	-2.023432	1(1)	-5.445535
BLA_GDP	-2.085344	-2.167263	-2.177859	-2.000332	1(1)	-5.202928
EXCHRATE	-2.234528	-2.332734	-2.349388	-1.837490	1(1)	-6.006474
RINTRATE	-2.546638	-2.544532	-2.601293	-2.337422	1(1)	-5.645739
MKTCAP_GDP	-2.620087	-2.622067	-2.700263	-2.300154	1(1)	-6.748390

Source: Author's Eviews output.

Where:

BA_GDP = Ratio of Bank Assets to GDP
BD_GDP = Ratio of Broad Money (M2) to GDP
BLA_GDP = Ratio of Bank Loans and Advances to GDP
EXCHRATE = Exchange Rate
RINTRATE = Real Interest Rate
MKTCAP_GDP = Ratio of Market Capitalization to GDP.

From the above diagnosis, the null hypothesis of a unit root is H0: a = 0 versus the alternative: H1: a < 0. The ADF unit root test result presented above shows that ratio of bank assets to GDP; ratio of bank deposit to GDP; ratio of bank loans and advances to GDP; exchange rate, real interest rate and ratio of market capitalization to GDP are having unit root problems which are not stationary at level. However, by differencing, the non-stationary time series became stationary at 1st difference as their ADF test statistic is greater than their critical values at different levels of significance.

RESULTS AND DISCUSSIONS

Table 2: Least Square Regression Results

Dependent Variable: DBA_GDP
Method: Least Squares
Date: 01/26/16 Time: 08:32
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DRINTRATE	0.180351	0.077016	2.341730	0.0275
DEXCHRATE	-0.030733	0.082470	-0.372653	0.7125
DMKTCAP_GDP	57.57661	157.5379	0.365478	0.7178
C	0.502025	1.364713	0.367861	0.7161

	0.421117	Mean dependent var	0.635885

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

R-squared			
Adjusted R-squared	0.394051	S.D. dependent var	7.680592
S.E. of regression	7.310493	Akaike info criterion	6.943941
Sum squared resid	1336.083	Schwarz criterion	7.132533
Log likelihood	-96.68714	Hannan-Quinn criter.	7.003005
F-statistic	5.968934	Durbin-Watson stat	1.265635
Prob(F-statistic)	0.044435		

Source: Authors' Eview output

Table 3: Least Square Regression Results

Dependent Variable: DBD_GDP
Method: Least Squares
Date: 01/26/16 Time: 08:55
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEXCHRATE	6.46E-05	0.000390	0.165695	0.8697
DRINTRATE	0.000890	0.000364	2.442726	0.0220
DMKTCAP_GDP	-0.181629	0.745066	-0.243776	0.8094
C	0.003640	0.006454	0.564019	0.5778

R-squared	0.387026	Mean dependent var	0.003821
Adjusted R-squared	0.320669	S.D. dependent var	0.036458
S.E. of regression	0.034575	Akaike info criterion	-3.763955
Sum squared resid	0.029885	Schwarz criterion	-3.575363
Log likelihood	58.57735	Hannan-Quinn criter.	-3.704891
F-statistic	2.044752	Durbin-Watson stat	0.946842
Prob(F-statistic)	0.033253		

Source: Authors' Eview output

Table 4: Least Square Regression Results

Dependent Variable: DBLA_GDP
Method: Least Squares
Date: 01/26/16 Time: 09:00
Sample (adjusted): 1987 2015
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEXCHRATE	-0.000364	0.000433	-0.839306	0.4093
DRINTRATE	0.001180	0.000405	2.917846	0.0073
DMKTCAP_GDP	0.155590	0.827420	0.188042	0.8524
C	0.002109	0.007168	0.294269	0.7710

ISSN 2054-6319 (Print), ISSN 2054-6327(online)

R-squared	0.465655	Mean dependent var	0.002884
Adjusted R-squared	0.407533	S.D. dependent var	0.042338
S.E. of regression	0.038396	Akaike info criterion	-3.554276
Sum squared resid	0.036857	Schwarz criterion	-3.365684
Log likelihood	55.53701	Hannan-Quinn criter.	-3.495211
F-statistic	3.014642	Durbin-Watson stat	1.449959
Prob(F-statistic)	0.048835		

Source: Authors' Eview output

The table 2 above indicates the adjusted coefficient of multiple determinations which shows that 39.40% of the variations in the dependent variable financial deepening were explained by our model. At F-statistic of 5.96% our model is significant as the probability of the F-statistic which is 0.044 < 0.05 significant value.

The table also reveals that the real interest rate and ratio of market capitalization of listed equities to GDP have positive relationship with financial depth while exchange rate has a negative relationship with financial depth both in table 2 and 4. The overall regression result suggests that the variations in foreign exchange in Nigeria have not have a positive effect on financial depth as measured by the ratio of bank assets to GDP, bank deposit to GDP and bank loan and advances to GDP respectively.

Discretely, the regression output from the date shows that only interest rate has a significant effect on financial depth in all the tables from table 2 to table 4. This is evidenced as all the values are less than 0.05 levels of significance in the respective tables.

CONCLUSIONS

This study investigated the effect of the variations in foreign exchange on financial depth in Nigerian. The regression results for the three models with three different dependent variables: ratio of bank asset to GDP, ratio of bank deposit to GDP and ration of bank loan and advances to GDP revealed that the variations in foreign exchange in Nigeria have not had the anticipated positive effect on the depth of the Nigerian financial sector. This implies that the Nigerian economy has been remarkably unsuccessful in experiencing constant exchange rate which is capable of attracting foreign investment.

It has been observed that floating exchange rate system was found to be an inhibitor to the financial sector. Hence, our findings suggest a stable exchange rate regime and an enhanced loan policy to maximize good economic performance. To reap the benefits of stable exchange rate, this study recommends that the Nigerian government should be conscious of over-dependence on oil and promote increased production in the non-oil sector of the economy by creating a level-playing field for private sector led activity.

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