Empirical Assessment of Foreign Exchange Market Effect on the Nigerian Emerging Economy

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ABSTRACT

This study examined Foreign Exchange Market effect on the Nigerian emerging economy. Specifically, the study considers the significant effect of foreign exchange rate, Balance of payment, Inflation rate and Interest rate on the Nigerian economy using time series data for period 1988 to 2014. The study employs the Augmented Dickey Fuller test to carry out the stationarity test of the variable. The Johnson co-integration and error correction mechanism (ECM) statistical techniques where used to ascertain the short run and long run dynamic relationships between the dependent and independent variables. The findings show among others that five period lag of EXR brings a decrease on the economy of Nigeria; an indication that the foreign exchange market had negatively impacted the Nigerian economy within the period of study. Premised on this, the paper recommends that discipline has to be maintained in the foreign exchange market and the parallel foreign exchange market in order to achieve the objective of having a realistic exchange rate.

KEYWORDS: *foreign exchange rate, balance of payment, inflation rate, interest rate.*

JEL CLASSIFICATION: *M10.*

1. INTRODUCTION

No nation of the world lives in isolation. There are usually forces of market demand and supply of goods and services between it and the rest countries of the world. The exchange of goods and services takes place on the platform of foreign exchange market. Through the foreign exchange market, a country is able to sell domestically manufactured goods and services to other countries of the world. In the same manner it buys goods and services via the foreign exchange market; and by so doing enhances trade liberalizations, the growth rate of output, the amount of per capital income and engenders economic growth and development. Adekanye (1986) notes that the foreign exchange market is a medium of interaction between the sellers and buyers of foreign exchange in order to establish a mutually acceptable price for the settlement of international transactions through the intermediation of banks and Bureau De Change. In the foreign exchange market, the authorized participants include commercial banks which are the main dealers and the banks abroad which serve as correspondents as well as the Central Bank of Nigeria which act on behalf of the federal government of Nigeria as a regulatory agency. The supply of foreign exchange in the foreign exchange market is derived from exports, foreign loans, expenditure by foreign tourists in a country, capital repatriation amongst others. The transactions in the foreign exchange market in the form of demand which include imports, external debt payments, remittances to other countries (Ngerebo, 2012). The aim is to improve the performance of the economy.

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The only major channel through which goods and services are traded in the foreign exchange market is by means of foreign exchange currencies. Foreign exchange currency is the means of effecting payments for international transactions and it is made up of convertible currencies that are generally accepted for settlement of international trade and other obligations (Arome, 1994). Almost all the transactions in the foreign exchange are important aspect of financial sector activities. Arguably it is the largest and most extensive financial market in the world. Apart from the fact the foreign exchange market being a channel for settlement of international transactions, it functions as the medium of interaction between sellers and buyers of foreign exchange. International transactions and activities in the foreign exchange markets have been distorted over the years due to varying foreign exchange policies and regimes, especially ranging from fixed foreign exchange rate regime to the present day flexible exchange regime. Just as most countries of the world have continued to enjoy the benefits of international trade through the foreign exchange market, there is no doubt they have had a fair share from the attendant adverse effects. Foreign exchange market is expected to engender the acceleration of a country's economy. This presupposes that trades in the foreign exchange market, all things being equal correlate with economic growth. Economic growth means either the growth in a nation's real GDP or the physical expansion of the nation's economy. Growing economies provide the means for people to enjoy better living standards. Economic growth is the most watched economic indicator as it tells how much more the economy is producing than it did before. If the economy is producing more, businesses are more profitable, and stock prices rise, this gives companies capital to invest and hire more employees. As more jobs are created, incomes rise; this gives consumers more money to buy more products and services, driving more economic growth. For these reasons, all countries want positive economic growth. In this regard, prior researches have attempted to draw the nexus between foreign exchange market and economic growth. While some have linked strong positive relationship between foreign exchange market and economic growth (Obansa, Okoroafor, Aluko & Milliceut, 2013).Others such as Adeniran, Yusuf and Adeyemi (2014) find no significant positive effect of foreign exchange market on economic growth. Thus, it appears that the effect of the foreign exchange market on the Nigeria economy is inconclusive and pose a gap for further empirical investigation. Against this backdrop, this study examines the foreign exchange market and the Nigerian economy. The rest of this paper is structured into section two, the review of related literature, section three, methodology; section four, empirical analysis; and section five, the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Empirical Review
On the empirical fronts several studies have ascertained relationship between foreign exchange market and economic growth both in developed and developing countries. A country with more flexible and faster economic growth is significantly associated with real exchange rate depreciation (Hausman, Prichett & Rodrik, 2005). Adeniran, Yusuf and Adeyemi (2014) find no significant positive relationship between economic growth performance in Nigeria and foreign exchange market. Bailliu, Lafrance and Perrault (2002) find that exchange rate regimes whether they are pegged, intermediate, or flexible, exert a positive influence on economic growth while Kyereme (2004) find a significant long-run relationship between real output growth and the exchange rate regardless of the kind of regime. Rano-Aliyu (2009) in a study carried out in Nigeria, finds that the appreciation of exchange rate exerts positive impact on real economic growth in Nigeria; although such appreciation results in loss of competitiveness. Dubas and Lee (2005) find a robust relationship between exchange rate stability and growth while Salami (2006) concludes that

exchange rate is the most important variable that affects private foreign investment in Nigeria of all the other macroeconomic variables. A study by Oladapo and Oloyede (2014) shows that there is a significant relationship between exchange rate, export, import, inflation and the Nigerian economic growth using Johansen co- integration and error correction model. Asher (2012) examined the impact of exchange rate fluctuation on the Nigeria economic growth period of 1980 – 2010. The result showed that real exchange rate has a positive effect on the economic growth. In a similar study, Akpan (2008) investigates foreign exchange market and economic growth in an emerging petroleum based economy from 1970-2003 in Nigeria. He finds that positive relationship exists between exchange rate and economic growth. Obansa, Okoroafor, Aluko and Millicent (2013) also examined the relationship between exchange rate and economic growth in Nigeria between 1970 and 2010. The result indicates that exchange rate has a strong impact on economic growth. However, other works like Hausman, Pritchett and Rodrik (2005) on the impact of exchange rate on economic growth. In the light of these contradictions in empirical literature on the effect of exchange rate on economic growth, this study attempts an empirical examination of the impact of foreign exchange market on the Nigerian economy in order to extend the scope and depth of the debate.

3. METHODOLOGY

The objective is to examine the foreign exchange market and the Nigerian economy. An ex-post facto research design is used for Twenty seven (27) year study period. Times series data extracted from secondary sources basically from the Central Bank of Nigeria statistical bulletin were used in the study under the period 1988 to 2014. The choice of this period is premised on the fact that the foreign exchange rate reform favouring the flexible exchange rate regime came to stay from the period 1986 in the Nigerian foreign exchange market. It is therefore important to empirically ascertain how this period alongside with the transactions in the foreign exchange market have significantly impacted on the Nigeria economy.

3.1 The model of the study
The model specification used in this study is underpinned to the works of Oladapo and Oloyede (2014); Okosodo and Imosili (2014) respectively with a modification so as to empirically determine the impact of the foreign exchange market on the Nigeria economy.

The model is stated in its functional form as:
GDPGR=F(EXR,BOP,INFR,INTR)…………………………………………………………..(1)

This is further stated in a stochastic form below:
$GDPGRt = \beta O + \beta 1 linEXR + \beta 2 lnBOPt + \beta 3 INFRt + \beta 4 INTRt + \mu_t$ ...…………….....(2)

Where, GDPGR = Gross Domestic Product Growth Rate in natural logarithm
EXR = Exchange rate, measured using nominal exchange rate.
BOP = Balance of Payments measured using the natural logarithm of balance of payment)
INFR = Inflation rate, measured using core inflation rate.
INTR = Interest rate, Measured using prime interest rate.
t = Time period
μ = Error Term
β_0 = constant term.
β_1- β_4 coefficients of the independent variables

The *a-prior* expectation is of the form:
β_1-β_3,>0. Here the explanatory variables are expected to positively influence the gross domestic product growth rate in the period examined. However, $\beta_{4<0}$ Here interest rate is expected to exert negative influence on the economy. The ordinary least square estimation techniques embodying the Error Correction model (ECM) framework is used in this study. The goal of the ECM is to help explain the short - run and long – run relationships between the dependent variable and independent variables as well as to determine the dynamics of having long - run equilibrium as far as exchange rate and GDP growth rate are concerned. Similarly, the Johnson – co- integration test is used in this study to test for the presence of long – run relationship between the dependent variable and the exogenous variables. This is done using the trace statistics and maximum Eigen statistics. It is only on the basis of the fact that the long – run relationship has been established that ECM estimation can be deemed to capture both the long and short – run dynamics. To meaningfully achieve this, unit root test using the Augmented Dickey Fuller (ADF) is conducted on the time series in order to avoid having a spurious regression result.

4. DATA ANALYSIS AND RESULTS

This section begins with the application of unit test through the use of augmented dickey fuller test to determine the stationarity of the variables. Usually, the ADF results are compared with Mckinnon critical values at 5% beginning at levels to first difference and then to second difference as the case may be. The aim is to avoid spurious repression. Thereafter, application of an appropriate estimation technique is made.

Table 1. Summary of the ADF unit root test at 5% level of significance

Variables	ADF Statistics	T- critical values	Observation
GDPGR	-4.983740	-3.004861	Stationary at second difference
LBOP	-7.293405	-2.981038	Stationary at first difference
LEXR	-6.712541	-1.981038	Stationary at first difference
LINFR	-4.415300	-2.981038	Stationary at first difference
LINTR	-4.781234	-2.976263	Stationary at level

Source: Author's Computation from E-view 8.0

The table above presents the Augmented Dickey Fuller unit root test results for the time series. The result shows that the log of interest rate is stationary at level. The log of BOP, EXR, FER and INFR are stationary at first difference while only GDPGR is observed to be stationary at second difference. Therefore, having established the stationary of the series the next step is to carry out a co-integration test which is a necessary condition for achieving a long run relationship among the variables in the unspecified model. The Johansen co-integration result is presented below.

From table 2, it can be observed that the model predicted about 97% systematic variation in the dependent variable, GDPGR using the adjusted coefficient of determination, leaving about 3% unaccounted for to stochastic error term. It suggests that foreign exchange markets in the long-run influences the growth of the Nigerian economy. The F – Statistic value of 217.77 reveals that all the explanation put together are statistically significant at 99% level. It indicates the goodness of fit of the model. The individual coefficient indicates that a percentage change in exchange rate and balance of payment increase the growth of the Nigerian economy were not statistically significant at 95% level. A percentage changes in inflation rate and interest rate result to decrease in the growth of the Nigerian economy on the

long – run bases. Also, the Durbin – Watson statistic value of1.708 shows the absence of serial Autocorrelation in the time series data.

Table 2. Ordinary Least Squares Multivariate Regression Result –
Dependent variable: GDPGR

Variables	Coefficient	Prob.value
C	-8591C*****	
	[1.166]	0.256
LEXR	7220.28*****	
	[-0.026]	0.979
LBOP	0.499*****	
	[-0.777]	0.445
LINFR	-598.89*****	
	[-0.266]	0.792
LINTR	-54258.15*****	
	[-0.754)	0.459
R-square =0.981		
Adjusted R-square = 0.976		
F-statistic = 217.77		
Prob.(F-statistic) = 0.000		
Durbin-Watson stat = 1.708		

******Coefficient values
[ ] * T- statistic value in parenthesis

Source: author in E-views 8.0

Table 3. Co-integration Analysis – unrestricted co-integration rank Test

Hypothesis	Trace statistics	Critical value at 5%	Maximum Eigenvalue	Critical values at 5%
R = 0	123.008	95.753	40.936	40.077
R ≤ 1	82.071	69.818	29.014	33.876
R ≤ 2	53.056	47.856	22.916	27.584
R ≤ 3	30.140	29.797	18.228	21.131
R ≤ 4	11.911	15.494	10.245	14.264
R ≤ 5	1.666	3.841	1.666	3.841

Source: computed from E-views 8.0

The trace test of the Johansen co-integration above indicates 4 co- integrating equations at the 5% significant level. However, the Maximum-Eigen value test indicates 1co- integrating equations at the 5% significant level. This suggests that there exist a long-run stable relationship between the dependent and independent variables. That is Nigerian economy and the independent variable foreign exchange market. The result reveals that any short-run deviation in their relationship would definitely return to equilibrium in the long run. This then affords us to apply the error correction mechanism (ECM).

It can be observed that the adjusted coefficient of determination puts the systematic variation at 63% leaving the remaining 37% unexplained primarily due to the presence of the stochastic error term. The F-Statistics value of 2.55 is statistically significant at 5% level, given the probability value of 0.01, i.e. (P = 0.01). It suggests a systematic relationship between the dependent variable and independent variables, and further depicts the overall goodness of fit of the model. Examination of the individual exogenous variable indicates that a five period lag of exchange rate DLEXR (-5) brings about 4% decrease on the Nigerian economy; and is statistically not significant at 5% level. A ten period lag of BOP brings about less than 1% increases on the Nigerian economy and is statistically not significant under the period observed. A two period lag of INFR brings about 4% increases on the Nigerian economy and

is not statistically significant at 5% level. Similarly, a four period lag of nominal interest rate DLINTR (-4) can be observed to increase the growth of the Nigerian economy with 5% and statistically not significant at 5% level. The ECM coefficient is negative (-0.096742) and is statistically significant at 5% level (P= 0.01 21). It shows that at any temporary deviation from the short-run equilibrium between DGDPGR and the regressors can be restored at the rate of 10%. The Durbin – Watson statistics of 1.88 which is approximately 2 indicates the absence of serial auto correlation dependence.

**Table 4. Parsimonious Error Correction Mechanism (ECM) Result –
Dependent variable: DLGDPGR**

Variables	Coefficient	Prob.value
C	0.167*****	
	[6.566]	0.000
DLLEXR(-5)	-0.041*****	
	[-1.695]	0.118
DLLBOP(-10)	0.430*****	
	[2.076]	0.545
DLLINFR(-2)	0.4.657*****	
	[1.231]	0.222
DLLINTR	0.654*****	
	[0.593)	0564
ECM(-1)	-0.096	
	[-3.000]	0.012
R-square =0.736		
Adjusted R-square = 0.625		
F-statistic = 2.547		
Prob.(F-statistic) = 0.051		
Durbin-Watson stat = 1.885		

Source: author in E-views 8.0

The importance of foreign exchange market serving as a platform to effectuate international trade and other payments cannot be overemphasized. A lot of factors over the years have distorted the efficiency of the foreign exchange market, ranging from policies to regimes and other factors. This study shed lights in this direction by examining the link between foreign exchange market and the growth of the Nigerian Economy. Numerous studies have produced positive relationship between foreign exchange market and the Nigerian economy but this study however makes a dissimilar finding. A five period lag of exchange rate is negative on the Nigerian economy and is not statistically significant in the period observed. It suggests that the flexible exchange rate in addition to the interplay of several factors have not influenced the exchange rate to positively impact on the Nigerian Economy. This attests to the fact that the unstable and/or constant over valuation and the devaluation of the naira to the foreign currency have contributed largely to the negative impact on the economy in this study. The finding is consistent with Adeniren, Yusuf and Adeyeni (2014) where they ascertained no significant positive effect of foreign exchange market on economic growth. Albeit, the finding is quite at variant with that of Obansa, Okrafor,,Aluko and Millicent (2013); and Akpan (2008). Two period lag of inflation rate and ten period of balance of payment were ascertained to positively enhance the growth of the Nigerian economy, though not statistically significant in the period considered. The finding is somewhat in tandem with Oladapo and Oloyede (2014); Malick and Marquese (2013): The implication of this is that the efficient working of the foreign exchange market without distortions by the activities of the black or parallel market, given a decrease in inflation rate is supposed to improve the economy. This is because it promotes liberalization and consequently foreign directed investments which combine to determine the growth of an economy. A four period lag of interest rate is positive

on the growth of the Nigerian economy, though it is not statistically significant in the short run. This is obviously a positive indication in the right direction and is contrary to the a-priori expectation of this study. A high interest rate is known to discourage borrowing, investment and consequently trading on the platform of the foreign exchange market. Interest rate in this study has positive effect at promoting trading activities in the foreign exchange market and on the overall economy of Nigeria.

5. CONCLUSIONS AND RECOMMENDATIONS

This study has empirically examined the nexus between foreign exchange market and the Nigerian economy. Given that the foreign exchange markets have been distorted over the years due to varying exchange rate policies, the foreign exchange market had a negative impact on the Nigerian economy in the long- run. In particular, the five period lag of exchange rate is negatively but not significantly related to economic growth, implying that the foreign exchange market in Nigeria in the short run is not translating to the growth of the economy. Based on the findings obtained, urgent steps and efficient working policies need to be radically embarked on by the current government to resuscitate the market with a view to enhancing the Nigerian Economy. It is further recommended that discipline has to be maintained in the foreign exchange market and the parallel foreign exchange market in order to achieve the objective of having a realistic exchange rate. It is important that the exchange rate is not over- valued, because this will result in unsustainable balance of payments and escalating external debt stock. In contrast, the exchange rate should find its equilibrium level to make the balance of payments position viable.

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