Exchange Rate Management and Economic Growth: An FMOLS Approach

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Abstract

Exchange rate instability is menacing economic growth in Nigeria. Fluctuations, whether positive or negative, increases risk and discourages trade hence is not desirable for the economy. This study therefore examine exchange rate fluctuation during the different exchange rate regime, its impact on economic growth rate to determine which of the exchange rate regime significantly influence economic growth in Nigeria covering periods from 1981 to 2015. The method of data analysis employed Augmented Dickey Fuller (ADF) Unit Root Test, Co-integration test, Fully Modified Ordinary Least Square (FMOLS) estimation technique and diagnostic tests. The FMOLS result revealed that exchange rate, external reserve, money supply and capital input have significant impact on the economic growth of Nigeria; whereas labour shows no significant impact on economic growth in the long run. Also, the dummy variable indicates a negative insignificant coefficient which suggests that fixed exchange rate wouldn't enhance the economy of Nigeria in the long run. This study concludes that sustained utilization of manage floating exchange rate regime in the country would significantly improve the domestic production leading to increase in the stock of external reserve in Nigeria. Therefore, the high frequency of change in exchange rate regime by the Central Bank of Nigeria (CBN) should be discouraged because exchange rate regime signifies a shock for currency markets. Likewise, the Federal government strives to accumulate external reserves and discourage the incessant sharing of the foreign earnings from crude oil exports between the federal, state and local governments.

1. Introduction

Over the last decades, several developing nations employed stringent exchange rate controls to protect their local industries in order to sustain economic growth in the country. Today, many economists has attributed the economic slow-down in some of these nations to these same protectionist policies. In sharp contrast, several Asian countries adopted a more liberal exchange rate regimes which has made such regions investment hubs and developed their productive capacity. Although Nigeria's exchange rate leans more towards protectionist policies which is geared at increasing domestic production, augmenting non-oil export products to promote the level of export competitiveness aggressively decreasing the dependence on imports. Furthermore exchange rate policy influences key macroeconomic objectives such as favorable balance of payments, reducing in unemployment rate, price stability and a sustained economic growth rate, (Adeyemi & Olawoye, 2012).

Studies shows that exchange rate management in some developing nations like Central and Eastern Europe in recent years has not aided economic growth, (Mehdi, Arezoo, & Alireza, 2014; Vieira, et al., 2013; Iuhia & Bogdan, 2012). Consistent currency devaluation has plagued many developing countries, including Nigeria. In fact, increase in the Nigerian exchange rate will make domestic goods more expensive and encourage consumers to substitute less expensive imported goods for home goods, which depresses the industrial sector of the country.

According to Umeora (2014), reduction in the uncertainty of exchange rates lowers expected profit of investment which could subsequently influence output and thus retard growth in the economy. The need for foreign exchange policy involves determining the precise rate at which foreign exchange transaction will take place. In determining exchange rate policy, it is therefore crucial to consider the country's economic structure and international characteristics. The Nigerian economy remain overly reliant on single commodity-petroleum and this has

endangered the economy to uncertainties due to the policies in the international market for petroleum. Also, the high level of importation to meet domestic needs puts severe pressure on the foreign exchange market and may result in the depletion of the external reserve.

In this context, measures aimed at diversifying the production and export base through incentives to promote exports of semi manufactured and manufactured goods will help increase foreign exchange earnings by the private sector. This will help reduce the demand pressure and ensure exchange earnings by the private sector and also help reduce the demand pressure and ensure exchange rate stability[1]. However, the inconsistency in policies and unstable exchange rate policies contribute to the volatile nature of the naira rate, (Jerumeh, et al., 2016). In spite of numerous efforts by the government to sustain a stable exchange rate, the naira continues to depreciate (Jerumeh, et al., 2016; Benson & Victor, 2012; Aliyu, 2011). In light of this background, the study investigates the relationship between foreign exchange management and Nigeria's economic growth.

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[1] For related studies on currencies, exchange rates, debt, leverage and performance, exchange rate and current account fluctuations, interest rates modelling, see Ibhagui (2018), Ibhagui and Olokoyo (2018), Ibhagui (2019), Ibhagui (2010), Ibhagui (2017), Ibhagui (2017) finds the sources of current account fluctuations in developed countries, Ibhagui (2017) Kassim (2015) investigates trade liberalization and balance of payments using pooled mean group while Ibhagui (2015) attempts to explain the differences in income levels in Africa using development accounting. Ahelegbey et al. (2016) and Ahelegbey (2016) design a Bayesian VAR model for networks analysis. This model will constitute the empirical framework for our future modelling exercise.

2. Stylized Facts

Historical Analysis:

Trends of Exchange rate indicating different Exchange rate regimes

The fixed exchange rate period is indicated by A, during this period the economic objectives have been a major consideration in determining the exchange rate although, in the period of exchange control in Nigeria (1962 – 1986) when ad hoc administrative measures were also applied. The period of 1962 to 1973, the currency of Nigeria was pegged to pound Sterling on a ratio of 1:1 before it later devalued by ten percent.

The regime was changed to in September 1986 to flexible exchange rate mechanism indicated by B where the market forces mostly controlled the rate of exchange which was introduced with the floating of the Naira in the second-tier Foreign Exchange market (SFEM).

However, after 1994 to 2015, the Central Bank of Nigeria employed both fixed and flexible exchange rate regime without long term commitment to any regime. The monetary authority frequently shifts between the two regimes. This period is usually regarded as dual exchange in different literature. The intervention of the Central banks is to ensure movement towards equilibrium and stabilize the rate of exchange in the market. The Bank sells foreign exchange to end-users through designated banks.

Figure 1: Trend of Exchange rate
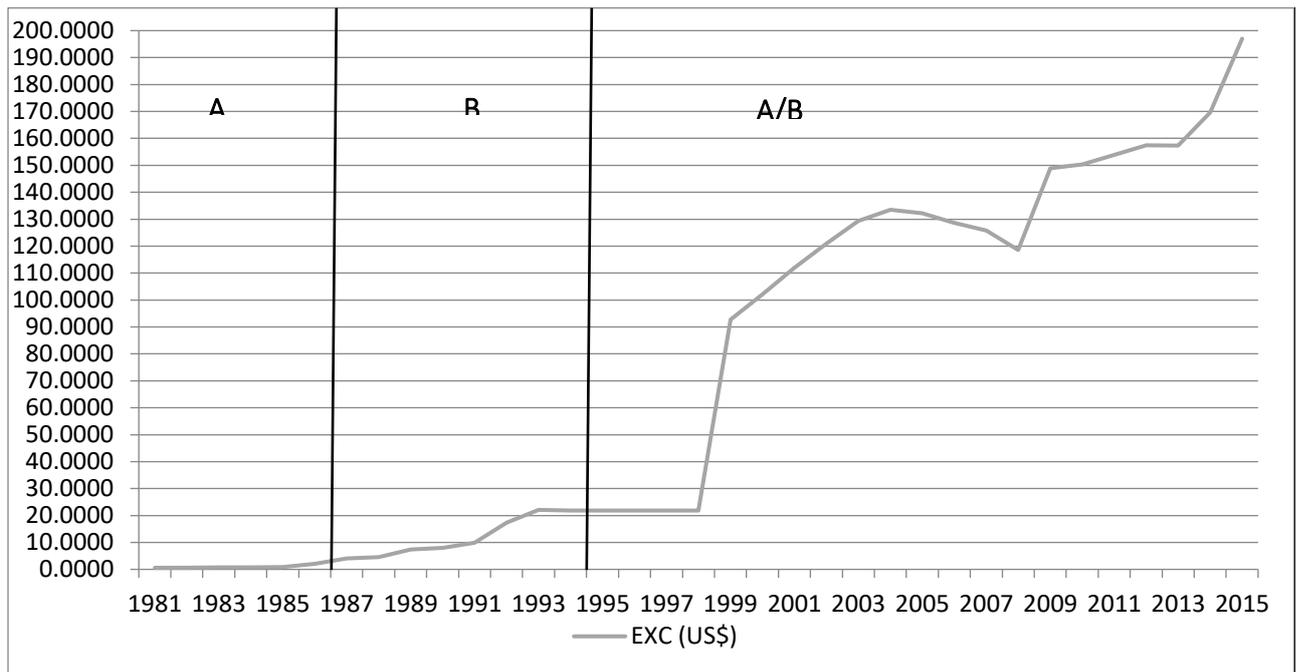
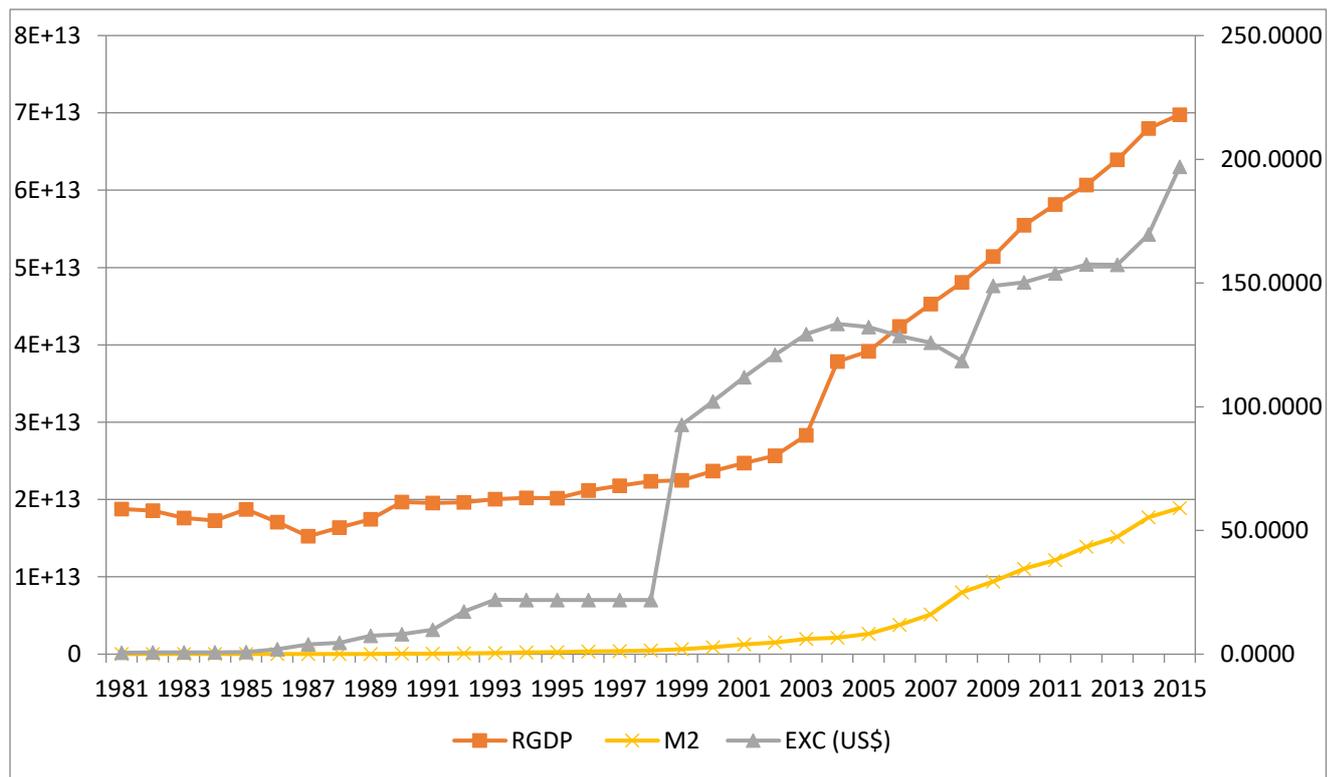Source: CBN Statistical Bulletin (2015)

Trend Analysis of Exchange rate, and Other Selected Variables

Trend analysis of exchange presented in Figure 1 reveal that the Nigeria exchange rate (EXR) was trending upwards most of the time. The exchange rate experience a sharp fall in two post-SAP periods in 1998 and 2008. During this period the exchange rate was market driven resulting the CBN intervention in 2008 in order to curtail the fall in exchange rate depreciation. While real economic growth was trending upward at a decreasing rate from 1981 to 1992 but grew at an increasing rate from year 1992 to 2013.

Also, even as the naira undergoes steady depreciation before the 21st century, the broad money supply (M2) was growing at increasing rate (see Figure 2). Nigeria recorded the highest broad money supply growth rate of 57.8 percent in 2008, noting that the country had since 2005 pursued expansionary monetary policy. The main components that contributed to this

expansion were credit to the private sector and net foreign assets. Recent improvements in fiscal policy enabled the government to avoid accommodation by the banking system with the resultant effect that the government's net position to the banking sector improved over the years. External Reserve was oscillating upward and downward even as the naira undergoes steady decline in value. External reserve of Nigeria oscillated below US$11 billion from 1981 to 2002 but rose sharply from about US$7.5 billion in 2003 to US$51.3 billion by the end of 2007 (see Figure 3). This rise could be explained by the three time increase in the spot price of crude oil (which is the main source of Nigerian external reserve) from about US$31 per barrel in 2003 to about US$95 per barrel by the end of 2007 (World Bank Data, 2014).

Figure 2: Trend of exchange rate, Money supply and Gross domestic product

Source: CBN Statistical Bulletin (2015)

Figure 3: Trend of exchange rate and External Reserve
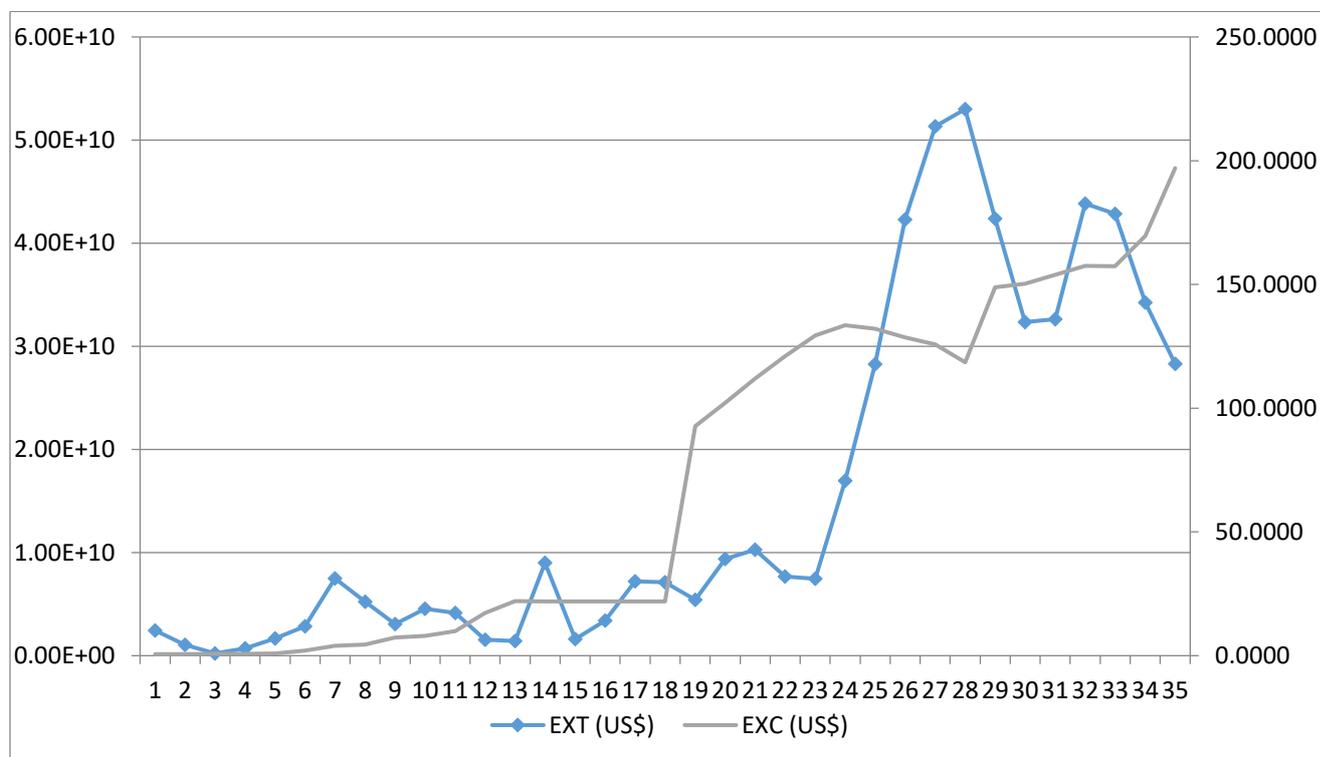
Source: CBN Statistical Bulletin (2015)

3. Interpretation and discussion of results

The method of data analysis employed is the Fully Modified Ordinary Least Square (FMOLS) estimation technique. FMOLS models are categories of multiple time series models that directly estimate the long run effect of the independent variables on the dependent variables after correcting for the endogeneity problem in the time series (Robin, 2008). FMOLS is also refers to as co-integrating equation model.

Summary of FMOLS results

Dependent Variable: LGDP

Variables	Coefficient	Standard error	t-statistic	P-value
LEXR	-0.074577	0.033289	-2.240305	0.0338**
LEXT	0.075917	0.020074	3.781798	0.0008**
LM2	0.142779	0.071544	1.995673	0.0565***
LCAP	0.242619	0.056883	4.265250	0.0002**
LLAB	0.423555	0.593716	0.713396	0.4820
DUM	-0.113835	0.055577	-2.048251	0.0508***
C	-5.403197	10.06439	-0.536863	0.5959

Source: Researcher's computation from E-view (8.0) note: (**), (***) significant at 5% & 10%

$R^2 = 0.98$, Adj. $R^2 = 0.975$

Fully Modified Ordinary Least Square (FMOLS)

The FMOLS was employed to evaluate the long-run impact of the independent variables on the dependent variable since Johansen co-integration test confirm the present of long run association of the variables employed. From the FMOLS results above, the adjusted R^2 of 0.975 indicates that the independent variables (i.e., exchange rate, external reserve, money supply, capital input and labour) in the model jointly explain 97.5 percent variations in the dependent variable (real gross domestic product) whereas other variables not captured in this model explained 5 percent changes in the dependent variable. The probability value of the individual explanatory variable reveals that all the explanatory variables are statistically significant at 5 percent significant level except labour and the dummy variable. Similarly, all the independent variables conformed to the expected effect except broad money supply. Specifically in the long

run, 1 percent increase exchange rate would induce 0.07 percent fall in economic growth while 1 percent increase in external reserve would induce 0.08 rises in economic growth. Also, 1 percent increase in capital would induce 0.24 percent rise in economic growth while the negative insignificant coefficient of the dummy variable suggests that fixed exchange rate is wouldn't enhance the economy of Nigeria in the long run.

In conclusion, result findings revealed that the Fully Modified OLS model of exchange rate management in Nigeria estimated in this study is free from plausible estimation error. Hence, this results can be used for policy implications.

Conclusion

The trend analysis of exchange rate suggests that the premium between the parallel and official rates has not been reduced, and that significant stability has not been achieved in the foreign exchange market. This could be that the Nigerian economy is highly opened and this openness has made it highly vulnerable to external shocks and exchange rate policy changes. In conclusion, sustained utilization of manage floating exchange rate regime in the country would significantly led to improvement in domestic production leading to increase in the stock of external reserve in Nigeria.

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