Comparative Analyses Of Exchange Rate Regimes And Nigeria's Economic Growth (1970 – 2016): A Structural Break Analysis

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Abstract: This paper centered on the comparative analyses of exchange rate regimes and the impact on the Nigerian economy for the period 1970 to 2016. Two exchange rate regimes have been adopted by the CBN from 1970 till date namely: Fixed and Flexible exchange rate regimes. Real GDP growth rate, Exchange rate and Inflation rate are the variables used to formulate the model. The Chow test analyses sought to determine if the switch to flexible exchange rate in 1986 adopted by the CBN caused a significant structural break in the economy; the result shows otherwise leading to the conclusion that the flexible exchange rate regime did not exert a significant structural break in the Nigerian economy. The parameter estimates show that exchange rate has a significantly positive impact on Nigeria's economic growth for the period 1970 to 2016. Also, comparative analyses of the Pre SAP and Post SAP exchange rate regimes (Fixed and Flexible) showed that exchange rate has positive long run relationship with Real GDP for both periods but did not have a significant impact on economic growth during the Fixed exchange rate regime. However, inflation rate which was used as a control variable shows negative relationship on Real GDP during the two exchange rate regimes. The implication of these findings is that the flexible exchange rate regime has been more favourable to Nigeria's economic growth especially with the current CBN's floating exchange rate policy adopted since 2016. It is recommended that the CBN provide enough and adequate foreign exchange for international trade transactions as well as empowering and encouraging indigenous production of commodities to substitute imported goods in order to boost the economy and ensure self sufficiency.

Keywords: Chow Test, Comparative Analysis, Exchange Rate, Fixed Exchange Rate, Flexible Exchange rate

I. INTRODUCTION/BACKGROUND OF THE STUDY

The Central Bank of Nigeria had, during one of its Monetary Policy Committee (MPC) meeting in May of 2016 announced the departure fm the fixed exchange rate regime to a floating exchange rate. Prior to this, Nigeria had adopted a fixed exchange rate regime after independence in 1960 up to 1985 when the regulatory authority jettisoned it for the flexible exchange rate regime.

Exchange rate has changed within the time frame 1970 to 2016 from regulated to deregulated regimes. Ewa (2011) agreed that the exchange rate of the naira was relatively stable between 1973 and 1979 between ₦0.60K - ₦0.66K per Dollar during the oil boom era and when agricultural products accounted for more than 70% of the nation's gross domestic products (GDP). In 1986 when Federal government adopted Structural Adjustment Policy (SAP), the country moved from a fixed regime to a flexible exchange rate regime where exchange rate is left completely to be determined by market forces. The Naira increased to ₦ 2 per Dollar in 1986 and further rose to ₦ 8 per Dollar in 1990. The flexible exchange rate regime further witnessed a steady dip in the value of the Naira against the USD until the CBN reviewed the regime and rather introduced the prevailing system which is the managed float whereby monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives (Mordi, 2006).

There has been a controversy as regards output of goods and services under the flexible exchange rate system and under the fixed exchange rate system. While Emeh and Johnson (2012) insist that flexibility in exchange rates does not have any relationship either directly or indirectly on the growth of output in Nigeria, Edwards and Levy-Yeyati (2003) contend that countries with more flexible exchange rate systems grow faster than countries with fixed exchange rate regimes.

This inconsistency in policies and lack of continuity in exchange rate policies aggregated unstable nature of the Naira rate (Gbosi, 2005). Benson and Victor, (2012) and Aliyu, (2011) noted that despite various efforts by the government to maintain a stable exchange rate, the Naira has depreciated throughout the 80's to date. Against this background, this research study is carried out as a comparative study in order to investigate the impact of the two exchange rate regimes on economic growth in Nigeria over a period of 47 years (1970 – 2016) and as well to know if the shift to flexible exchange rate regime caused a significant structural break in the Nigerian economy.

This paper is organized into *Eight* sections, including this introductory section. The second section is a review of exchange rate policies in Nigeria. The third and fourth sections review the relevant theoretical and empirical literatures. The fifth section is the model specification followed by the sixth section which provides the analysis and interpretation of the empirical results. The seventh section summarizes the findings made in the analyses while the last section being the eighth section is the conclusion and policy recommendations.

II. LITERATURE REVIEW

Exchange rate is the price of one country's currency in relation to another country. It is the required amount of units of a currency that can buy another amount of units of another currency (Adeniran, Yusuf and Adeyemi, 2014). Eze and Okpala (2014) assert that Exchange rate arrangements are broadly classified into three namely, fixed or pegged arrangements, flexible arrangements, and in-between category of arrangements with "limited flexibility"; Each variety or alternative have different implications which determines the extent to which countries participate in foreign exchange markets. When a monetary authority decides to fix exchange rates against other currencies, they make a commitment to intervene in the market, buying and selling their currency whenever necessary to keep the exchange rate from changing. When, on the other hand, the monetary authority abstains completely from intervening in the market for exchange rates, they are choosing to let their exchange rates float freely.

III. FIXED EXCHANGE RATE POLICY (1960 – 1985)

Exchange rate policy in Nigeria has undergone a good number of changes. It has developed from a fixed parity in1960 when it was solely tied with the British Pound Sterling. By 1967, following the devaluation of the Pound Sterling the US dollar was included in the parity exchange. In 1972, the parity exchange with the British Pound was suspended as a result of the emergence of a stronger US dollar. In 1973, Nigeria reverted to a fixed parity with the British Pound following the devaluation of the US dollar. In

1974, in order to minimize the effect of devaluation of a single individual currency, Nigerian currency was tired to both to the pound and dollar. Almost throughout the 1970s there was persistent appreciation of the nominal exchange rate of the Naira occasioned by increases in the price of oil in the international market. These appreciations in the nominal exchange rates gave rise to over-reliance on imports with its accompanying capital flight, discouraging non-oil exports which ultimately led to Balance of Payments problems and depletion of external reserves. The increase in the marginal propensity to import, according to Osaka, Mashe, and Adamgbe (2003), the agricultural sector in Nigeria collapsed. In 1978, the naira was pegged to a basket of 12 currencies comprising Nigeria's major trading partners. However, the 1978 policy was jettisoned in 1985 in favour of quoting the naira against the dollar.

IV. FLEXIBLE EXCHANGE RATE POLICY (1986 – DATE)

Before 1986, the prevailing exchange rate policies encouraged over-valuation of the naira. To solve the problems associated with the over-valuation the naira was deregulated in September 1986 under the Structural Adjustment Programme (SAP) Package. To enhance the implementation of the Structural Adjustment Programme was the introduction of the Second-tier Foreign Exchange Market (SFEM). SFEM was expected to usher in a mechanism for exchange rates determination and allocation in order to ensure short term stability and long term Balance of Payments equilibrium. As stated by Mordi (2006) the essential objectives of SFEM include to achieve a realistic naira exchange rate through the market forces of demand and supply, more efficient allocation of resources, stimulation of non-oil efforts, encourage foreign exchange in flow and discourage outflow, eliminate currency trafficking by wiping out unofficial parallel foreign exchange market, and lead to improvements in the Balance of Payments.

Several modifications were made to the flexible exchange rate system in order to achieve the objectives of SFEM, from Foreign Exchange Market (FEM) to Autonomous Foreign Exchange Market (AFEM), to Dutch Action System and, to the wholesale Dutch Auction System. The FEM was introduced as a result of the problem arising from the first and second tier market rates in July 1987. Bureau de change was introduced in 1989 with a view to enlarging the scope of FEM. In 1994, the fixed exchange rate system was reintroduced. In 1995 there was a policy reversal of guided deregulation referred to as the Autonomous Foreign Exchange Market (AFEM). In 1999 was the reintroduction of the interbank foreign exchange market (IFEM). This brought about the merger of the dual exchange rate, following the abolition of the official exchange rate from January 1, 1999. In 2002 was the re-introduction of the Dutch Auction System (DAS) 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 reserves. Finally, was the introduction of wholesale DAS in 2006, which further liberalized the market in an attempt to evolve a realistic exchange rate of the Naira.

In June 2016, the Central Bank of Nigeria (CBN) introduced a flexible inter-bank exchange rate market, effectively floating the Naira in a departure from recent policies. This move, according to the CBN is justified based on the fact that in contemporary global economies, governments rarely operate a clearly defined exchange rate regime. Exchange rates globally hover between the polar opposites (fixed or floating) depending on the level of government intervention.

Up till now, exchange rate regime in Nigeria is characterized as oscillating between fully managed and freely floating regimes.

V. THEORETICAL FRAMEWORK

The Balance of Payments Theory: As demonstrated by Jhingan (2011), under a free exchange rate regime, a country's exchange rate depends upon its Balance of Payments. A favorable Balance of Payments raises the exchange rates, while an unfavorable balance of payments reduces the exchange rate. By implication, exchange rate is determined by the demand and supply of foreign exchange. According to this theory, adjustments in the balance of payments can be made through devaluations and revaluations of some currencies in the case of deficits and surpluses, respectively, in the balance of payments.

The Purchasing Power Parity (PPP) Theory: According to Jhingan (2011), this theory states that equilibrium exchange rate between two inconvertible paper currencies is determined by the equality of the relative change in the price levels in the two countries. International competitiveness is measured by comparing the relative prices of the good from different countries when these are measured in a common currency. The Purchasing Power Parity Path for the nominal exchange rate is the path that would keep competitiveness constant overtime. According to this theory, countries with higher domestic inflation than their competitors would face a depreciating nominal exchange rate, while countries with lower domestic inflation than their competitors would face appreciating exchange rates.

VI. EMPIRICAL REVIEW

Arinze, Osang, and Slottje (2000) found a significant negative relationship between increases in exchange rate volatility and exports in developing countries using the GARCH approach. Eme and Johnson (2012) investigated the effect of exchange rate movements on real output growth in Nigeria for the period 1986 – 2010. The result revealed that there is no evidence of a strong direct relationship between changes in exchange rate and output growth. Rather, Nigeria economic growth has been directly affected by monetary variables.

Edwards and Levy Yeyati (2003) found evidence that countries with more flexible exchange rate grow faster. Faster economic growth is significantly associated with real exchange rate depreciation.

Tamunonimim, Ngerebo-a & Reginald (2013) investigated the causal relationship between exchange rate, balance of payment, external debt, external reserves, gross domestic product growth rate and inflation rate in Nigeria post Structural Adjustment Programme (SAP). The Johansen cointegration result shows that there exists a long-run equilibrium relationship among the indicators. The Granger causality test between the dependent and independent variables shows a unidirectional causality from exchange rate to BOP, external reserves and gross domestic product growth rate. The independent variables indicate a unidirectional causality from gross domestic product growth rate to external reserve.

Similarly, Adeniran, Yusuf and Adeyemi (2014) The Impact of Exchange Rate Fluctuation on the Nigerian Economic Growth: An Empirical Investigation, International Journal of Academic Research in Business and Social Sciences August 2014, Vol. 4, No. 8

Eze and Okpala (2014) used a test of stability of parameter estimates approach to tested the impact of the two basic exchange rate policies, namely, the fixed and flexible regimes, using the Chow test procedure to determine the structural stability of the relationship between exchange rate and output of goods and services during the two regimes. The estimated long run equation revealed that, apart from government expenditure (GEX), both exchange rate (EXR) and money supply (M2) are highly significant in the determination of Nigeria's economic growth performance. The conducted Chow test showed that the relationship between exchange rate and economic growth performance in Nigeria have not undergone any significant structural changes. They further assert that the implication is that no matter the exchange rate regime, whether fixed or flexible, what matters is the effectiveness of the management.

Magda (2004) examined the effect of exchange rate fluctuations to real output growth and price inflation in a sample of 22 developing countries. By introducing a theoretical rational expectation model he decomposed movements in exchange rate into anticipated and unanticipated components. The model demonstrated the effects of demand and supply channels on the output and price responses to changes in exchange rate. In general, he concluded that exchange rate depreciation; both anticipated and unanticipated decreases real output growth and increase price inflation. The result confirms concerns about the negative effects of currency depreciation on economic performance in developing countries.

VII. METHODOLOGY

Our model shall take into consideration the exchange rate regimes in Nigeria termed the pre-SAP and post-SAP exchange rate regimes. Mordi (2006) observed that exchange rate policy in Nigeria has gone through many changes from the fixed regime to the flexible exchange rate regime. The

fixed exchange rate system was adopted between 1960 and 1986, while the flexible system has remained in use from 1986 till date with series of little modifications by the CBN. Applying the Chow-Test procedure, we determine if the two exchange rate regimes caused a significant structural break in Nigeria's economic growth. Borrowing from the model specified by Eze and Okpala (2014), we reduce their linear model to include only inflation rate as a key proximate determinant of exchange rate affects on economic growth. Estimating the model thus:

Fixed Exchange Rate regime: 1970-1985: $RGDP_t = \beta_0 + \beta_1 EXCHR_{1t} + \beta_2 INFLR_{2t} + \varepsilon_{t1}$

Flexible Exchange Rate regime: 1986-2016: $RGDP_t = \beta_3 + \beta_{4t} EXCHR_{4t} + \beta_5 INFLR_{5t} + \varepsilon_{t2}$

Entire Period: 1970-2016
$RGDP_t = \beta_6 + \beta_7 EXCHR_{7t} + \beta_8 INFLR_{8t} + \varepsilon_{t3}$

$n1 = 16, n2 = 31, n3 = 47$

Where:

RGDP	= Real Gross Domestic Product
EXCHR	= Exchange Rate
INFLR	= Inflation Rate
$\beta_0 - \beta_8$	= parameters to be estimated
t	= time period
ε_t	= Stochastic Error term

VIII. RESULTS AND ANALYSES

The unit root test is carried to determine the stationarity and order of integration of the variables used in the model. This is very necessary in order to avoid a spurious regression and ensure that the data have time series properties. The test of stationarity is summarized below:

Variable		ADF test statistic @ level	ADF test statistic @Ist Difference	Order of Integration
RGDP		-5.279960*	-11.77976*	I(0)
EXCHR		-1.466592	-6.521369*	I(1)
INFLR		-3.341995	-6.687324*	I(1)
Critical values	1%	-4.170583	-4.175640	
	5%	-3.510740	-3.513075	
	10%	-3.185512	-3.186854	

*Source: Extracted from Eviews Output, * means significant at 5% level*
Table 1: Unit Root Test Result

As shown in the table 1 above, Real GDP is stationary at level meaning that its order of integration is I(0). Exchange rate and Inflation rate are both stationary at first difference giving their order of stationarity to be I(1). The stationarity test above confirms that the statistical properties of the data used in the model are constant and do not change over time hence we can use the data to estimate our regression without encountering a spurious result. The Johansen cointegration test will be adopted to check whether a long run relationship exist among the variables. The cointegration test is presented in the table 2 below:

The Chow Test: The Chow test is a test for the presence of structural break in the parameters of the model. We determine if the shift from fixed to flexible exchange rate regime caused a significant break point in the trend of economic growth in Nigeria. We obtained the Chow test from the Eviews output as follows:

Chow Breakpoint Test: 1986
Null Hypothesis: No breaks at specified breakpoints
Varying regressors: All equation variables
Equation Sample: 1970 2016

F-statistic	0.107641	Prob. F(3,41)	0.9552
Log likelihood ratio	0.368728	Prob. Chi-Square(3)	0.9466
Wald Statistic	0.322922	Prob. Chi-Square(3)	0.9557

Source: Extract from Eviews output
F-statistic = 0.107641
F-tables = F0.05, 2, 45 = 3.23
Table 2: Chow Test Estimate

The theoretical value of 3.23 for 5% level of significance at 2 and 45 degrees of freedom for the numerator and the denominator, respectively, is greater than the computed F* value of 0.1076, (i.e. 3.23 > 0.10764). This result supports the hypothesis that the relationship between exchange rate and economic growth has not undergone any structural break over the period under study 1970 to 2016. This means the change in exchange rate regimes did not cause a significant break-point in economic growth hence we estimate the long run effect of exchange rate on Real GDP below.

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.331652	30.94698	29.79707	0.0367
At most 1	0.231833	12.81437	15.49471	0.1218
At most 2	0.020797	0.945728	3.841466	0.3308

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
Table 3: Johansen Co-integration Test result

Table 2 above shows that there is 1 co-integrating equation at 5% significance level and we conclude that there exists long run equilibrium relationship between real gross domestic product (RGDP), exchange rate (EXCHR) and Inflation rate (INFLR).

By establishing the existence of co-integrating long run relationship among the variables, we confirm that Exchange rate and Inflation rate influences Nigeria's Real Gross Domestic Product in the long run. Since the Chow test shows no structural break in the economy given the exchange rate regimes adopted by the CBN, we estimate the Ordinary Least Square Regression of the three periods in order to compare the nature of relationship that exist between Real GDP and exchange/inflation rates for the fixed and flexible exchange rate periods. The estimated regression equations are:

a. FIXED EXCHANGE RATE REGIME: 1970-1985

Substituted Coefficients:
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RGDP = 2.7597 + 3.6157*EXCHR - 0.0937*INFLR
t =   (0.1659)   (-0.5527)

b. FLEXIBLE EXCHANGE RATE REGIME: 1986-2016:

Substituted Coefficients:
=========================
RGDP = 4.1537 + 0.0193*EXCHR - 0.0289*INFLR
t =   (3.3499)   (-2.6406)

c. ENTIRE PERIOD: 1970-2016

Substituted Coefficients:
=========================
RGDP = 4.3291 + 0.0189*EXCHR - 0.0383*INFLR
t =   (4.581068)   (-0.855210)

A cursory examination of the regression estimates above shows that during the fixed exchange rate regime, exchange rate exhibited a positive relationship with Real GDP increasing by 3.6157 units while inflation rate had an inverse relationship decreasing Real GDP by 0.0937 units. During this fixed exchange rate regime, the economy grew by 2.7597 units. Both exchange rate and inflation rate have insignificant impact on economic growth during the period. The R-squared showed a high explanatory power during this period at 63%.

However, as the Central Bank introduced the Flexible exchange rate policy, GDP further increased to 4.1537 units with exchange rate also increasing Real GDP by 0.0193 units while inflation rate still had a negative relationship with Real GDP decreasing by 0.0289 units. In terms of individual significance, both variables were individually significant at 5% level meaning that they both have significant impact on economic growth during the flexible exchange rate regime with 60% explanatory level.

For the entire period under study (1970-2016), Exchange rate and Inflation rate exhibited the same coefficient sign with real GDP with Exchange rate increasing Real GDP by 0.0188 units while Inflation rate decreased real GDP by 0.0383 units. Exchange rate is significant with a model R-squared value of 72% which is a very good fit. The variables also showed joint significance in explaining the variations in Real GDP.

IX. SUMMARY OF FINDINGS

The findings made in this research work are very significant in the study of CBN's exchange rate policies. The findings are summarized thus:

✓ The period of fixed exchange rate regime in Nigeria (prior to 1985) witnessed an insignificant impact of exchange rate on Nigeria's economic growth despite the positive relationship with Real GDP.
✓ Real GDP grew by 3.6157 units with exchange rate accounting for 63% increase in Real GDP for the period prior to 1986.

✓ Inflation rate shows an expected negative relationship with economic growth for the two periods (Fixed and Flexible exchange rate regimes).
✓ One very interesting finding is that during the flexible exchange rate regime, exchange rate grew Nigeria's economy by 0.0193 units as against 3.616 units during the fixed exchange rate regime. In spite of the higher unit of growth of the latter, it still wasn't significant enough in growing the economy; the former however, was significant even with lower coefficient.
✓ Considering the whole period under study i.e. from 1970 to 2016, Exchange rate shows a steady contribution to economic growth growing Real GDP by 0.0189 units annually while inflation rate shows an expected negative relative with Real GDP. Both variables jointly accounted for 72% of the variables in Real GDP for the entire period.

X. CONCLUSION/RECOMMENDATIONS

The history of the Naira as it has alternated between fixed and floating exchange rate regimes has always affected the Nigerian economy both significantly and insignificantly. The Central Bank of Nigeria in May 2016 introduced a modified flexible exchange rate regime that allows the exchange rate to float freely and find its equilibrium in order to reduce pressure and introduce greater transparency in the foreign exchange market. The departure from fixed exchange rate in 1986 saw a significant impact of the exchange rate on the Nigerian economy with about 60% of Real GDP accounted for by exchange rate. Therefore, given the two exchange rate regimes adopted in Nigeria since the post-independence era, we can conclude that the flexible exchange rate regime has been more favourable to Nigeria's economy and it can contribute significantly to trade and foreign exchange in the long run with the sustenance of the current trend.

Sequel to the analyses of both exchange rate regimes in Nigeria, it is recommended that:

✓ The immediate effect of the flexible (floating) exchange rate regimes as being witnessed in Nigeria today is the general increase in the prices of commodities/products which are exchange rate sensitive, the Central Bank of Nigeria can make such increase in prices to be modest rather than sharp and severe by providing adequate foreign exchange to businesses who are in most need of it like in the oil sector so as to lighten the burden on the final consumers who are made to suffer the consequences.
✓ In addition to the above stated recommendation, government should empower local producers to massively produce commodities which are hitherto imported. They can do this by creating a favorable environment for production such as constant electricity, good roads, tax relief etc.
✓ Encouraging foreign investments into the Nigerian economy is another sure way to go in order to ensure the success of the flexible exchange rate regime. Government should also reduce and control rent-seeking and price arbitrage by some major players in the official foreign

exchange market (who create artificial inflation) by imposing severe sanctions on defaulters.

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