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Impact of Exchange Rate Management on the Nigerian Economic Growth: Empirical Validation

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Abstract
This paper examined the impact of Exchange Rate Management on economic growth in Nigeria between 1980 and 2015. The study was set to gauge how the management of exchange rate in Nigeria has impacted the economy. The study employed the Ordinary Least Square (OLS) method in its analysis. Co-integration and Error Correction Techniques were used to establish the Short-run and Long-run relationships between economic growth and other relevant economic indicators. The result revealed that exchange rate management proxy by various exchange rates regimes in Nigeria was not germane to economic growth. Rather, government expenditure, inflation rate, money supply and foreign direct investment significantly impact on economic growth in Nigeria. It is against this backdrop that the Nigerian economy must diversify her export base to create room for more inflow of foreign exchange.

Keywords: Exchange Rate, Management, Nigerian Economic Growth.

1. Introduction

The management of exchange rate has been a serious monetary issue for both developed and emerging economies, especially after the demise of the gold standard in 1946. This is mostly adduced to the fact that its supply is conditioned by a county's exports strength and competitiveness. The management of a nation's foreign exchange sometimes warrants intermittent government interventions, especially under a floating exchange rate regime. In Nigeria, the supply of foreign exchange is predominantly obtained from crude oil exports. It is equally obtained from capital receipts including drawdown on loans as well as remittances from Nigerians residing abroad (Obadan, 2002). Other invisible receipts by the private sector also constitute the supply of foreign exchange. Foreign exchange has been an area of interest to policy makers, economists as well as decision makers. It enables nations to sell their domestically produced goods and services across to other countries of the world (Adewuyi, 2002). Since no country can grow without trade or exchange, foreign exchange has played a vital role in restructuring the economic and social attributes of countries around the world, especially the less developed countries.

According to Abebiyi (2007), foreign exchange intervention occurs when a country's monetary authority or monetary power house sells foreign currency in the foreign exchange market with a view of influencing the exchange rate in a downward direction. The Central Bank of Nigeria (CBN) has severally and intermittently intervened in the foreign exchange market since 1986 when it was first deregulated as part of the package of the ill-fated Structural Adjustment Programme (SAP). The CBN has equally intervened in the areas of foreign exchange acquisitions with a view to accumulate foreign reserves for the government. According to Stimatele (2003), whether this occasional intervention by the monetary authority is positively impactful or otherwise is highly subjective and it has remains debatable in many economic literatures.

Several attempts have been made to manage and control the Nigerian exchange rate. In 1982 a comprehensive exchange controls were applied. This was occasioned by foreign exchange crisis that occurred that year. This led to the emergence of a Parallel Market premium because of disequilibrium in the official foreign exchange market. Second tier foreign Exchange Market (SFEM) was introduced in September 1986. Under SFEM, market forces determined the Naira exchange rate and allocation of foreign exchange. In February 1993 the Central Bank introduced pro-rata system of foreign exchange allocation. This was to ensure availability of allocations by all participating banks. The rate of foreign exchange in other segments was unstable but the official exchange rate of Naira was administratively stabilized. Differently put, there were some elements of foreign exchange fluctuations in some segment**s.** Section two of this paper will contain the relevant literature review, theoretical underpinnings of the subject matter will be undertaken in section three, empirical studies and concluding remarks will be done in section four and five.

2. Review of Conceptual, Theoretical and Empirical Literature

According to Nwankwo (1980), the fixed exchange rate regime was adopted in Nigeria shortly after independence in 1960 with the enactment of the Exchange control Act in 1962 where the CBN was vested with the authority to earn and disburse foreign exchange in the country. Between 1977 and 1981, a strict exchange control regime was administered to reduce the pressure on the external sector, but this failed to achieve the policy objective, hence, it was replaced with a managed exchange rate regime. Following the economic stabilization Act of 1982, the exchange rate was realigned and made more flexible, in order to stem frivolous demand for foreign exchange. These measures were sustained until 1986 when the Structural Adjustment Programme (SAP) was introduced. The reforms under the SAP brought about market driven exchange rate regime with the introduction of the Second- Tier Foreign Exchange Market (SFEM). What followed SFEM was a regime of failed experiments of administrative management of the exchange rate of the naira (Oloyede, 2002). Amongst the various regimes of exchange rate management are the Dutch Auction system (DAS), April 1987; the Autonomous Foreign Exchange Market (AFEM), 1988; the inter-bank Foreign Exchange Market (IFEM), 1989; DAS, 1990 and "guided deregulation" based on a dual exchange rates regime. Following the failure of IFEM, the DAS was reintroduced for the third time on 22nd July, 2002. The re- introduction of the Dutch Auction System (DAS) was as a result of the failure of the IFEM to meet policy expectations. IFEM was characterized by multiple malpractices. The DAS was then introduced in order to enhance transparency in the management of foreign exchange and to achieve a realistic exchange rate for the naira and discouraged speculative demand for foreign exchange.

Odusola and Akinlo (2001), found a mixed result on the impacts of the exchange rate depreciation on the output in Nigeria. In the medium and long term exchange rate depreciation exerted an expansionary impact on output but in the short run exchange rate depreciation does not expand output. This result partially corroborates what Rano-Aliyu (2016) found using Vector Error Correction Model (VECM) technique while Odusola and Akinlo (2001) used VAR and VECM. So, the difference in their results can be attributed to the difference in their methodologies.

Harris (2002) using the Generalized Least Square technique found that real exchange rate, when well managed affect productivity growth in both the short and long run, the result is consistent with the competitiveness hypothesis, which suggests that exchange rate depreciates boost productivity growth in the short run. Aghin et al (2006) in his study also found that the effect of exchange rate volatility, which is the consequence of how well the economy is managed on real activity is relatively small and insignificant. This is in consonance with the findings of Dubas and Lee (2005), who both found a robust relationship between exchange rate stability and growth. Furthermore, the result suggest that membership of the (South) Eastern and Central European countries in the European Monetary Union would have a positive impact on these countries' growth rates. In the case of Nigeria, Unugbro (2007) observed that exchange rate appreciation stimulates foreign direct investment while Salami (2006) found that exchange rate is the most important variable that affects private foreign investment in Nigeria of all the other macroeconomic variables.

2.1 Theoretical Underpinnings

In theory, there is a clear cut distinction between sterilized and non-sterilized exchange rate intervention policy. Foreign exchange market intervention is said to be sterile when monetary authority offsets its interventions (Rogoff, 1984). According to Adebiyi (2007), non-sterilized interventions induce changes in the monetary base and this result in monetary transmission mechanism. The changes metamorphosed into changes in money supply, interest rates, expectations capital flows and ultimately exchange rate. Since emphasis is placed on sterilized intervention mechanism, we shall therefore consider its variants.

2.2 Portfolio Balance Channel (PBC)

This is a case were investors even their portfolios between domestic and foreign assets on the basis of associated returns and risks of investment. This thereafter shifts exchange rate which ultimately influenced the domestic value of foreign assets and expected returns on investment. The fundamental assumption of this approach is risks differentials associated with domestic and foreign assets. Rogoff (1984), Lewis (1988) and Gosh (1992) have attempted to empirically test the validity of the PBC using two fundamental approaches; viz: the reduced form and the indirect approach. The result derived has not been plausible due to various empirical measurement problems when estimating the model.

The traditional approach was extended by incorporating Mean Variance Optimization (MVO) method. This approach as pioneered by Frankel (1992), builds a relationship between expected returns on investment and bonds supplies by requiring that the coefficients of an inverted assert demand function be closely related to the variance-covariance matrix. However, studies conducted by Dominguez & Frankel (1993), indicates that foreign exchange intervention is germane to portfolio balance.

2.3 Signaling Channel (SC)

In this regard, rational expectation via domestic and foreign asset acquisition creates room for exchange rate interventions. Mussa (1981) opined that SC occurs when domestic and foreign assets can easily and perfectly be substituted, necessitating the intervention of monetary authority to impact on exchange rate through expectations. To this end, agents perceived exchange rate intervention as an index of future monetary policy. With this interventions speculators their exchange rate expectations due the expected change in monetary policy that will eventually drive economic growth.

Two main positions can be appraised using the signaling channel hypothesis. Firstly, there is a nexus between exchange rate intervention and expectations from the standpoint of portfolio balance model. Secondly, how exchange rate interventions impact on and signals monetary policy (Sarno & Taylor, 2001). Testing the portfolio balance and the signaling channel models independently, Dominquez & Frankel (1993) observed that both channels were statistically significant. However, Humpage (1989) and Dominquez (1990) have earlier had a mix result. On whether monetary authorities' interventions provide germane information with respect of future monetary policy, Kaminsky & Lewis (1996) result was in the affirmative. Other studies that supported this position were Bonser-Neal & Tanner (1996) and Dominquez (1998).

3. Methodology

Unit Root Test; Augmented Dickey Fuller (ADF) was conducted on the series in order to detect the presence of unit root, the presence of which could make the regression result spurious (Granger & Newbold, 1974). The unit root test also helps ascertain the order of integration of the series, which is necessary to explore the long run relationship amongst the variables via the co-integration test. A necessary condition for co-integration is that they are integrated of the same order, which would have been ascertained via unit root test result. The Johansen Co-integration test is employed in this study, to test for the presence of a long run relationship between the dependent variable (exchange rate) and the independent variables. In this test type, the number of co-integrating relations is tested on the basis of trace statistics and maximum Eigen statistics. Once the long run relationship has been established, we estimate an Error Correction Model (ECM) that captures both the long and short run dynamics.

3.1 Model Specification

The empirical model of this study is based on the conclusion of our theoretical framework, in an effort to establish a link between exchange rate management and growth. Special reference is made to the work done by Sarkar & Amor (2009), which is modified for the purpose of the study:

$$GR_t = f(EXRT_t, INFR_t, Ms_t, GEXP_t, CAPU_t, FDI_t, U_t) \text{------(3.1)}$$

Where; GR is Growth rate (capturing the Nigerian economy), EXRT is exchange rate, INFR is inflation rate, MS is money supply, CAPU is capacity utilization, FDI is foreign direct investment and U is the error term (all at time t). In a more empirical manner, equation 3.1 can be stated as as:

$$GR_t = \int_o + \int_1 \ln EXRT_t + \int_2 \ln INFR_t + \int_3 \ln Ms_t + \int_4 \ln CAPU_t + \int_5 \ln GEXP_t + \int_6 \ln FDI_t + U_t \text{--(3.2)}$$

4. Analysis and Interpretation of Results

4.1 Test of Stationary

Augmented Dickey Fuller Unit root test was used to test for the stationary of each variable. A stochastic process is said to stationary if its mean and variance are constant overtime and the value are auto-covariance between the two period depends only on the distance or lay between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2003). In other word, a stationary stochastic process is one with constant mean, variance and covariance. Hence, stationary test is carried out to verify whether a time series is stationary or time-

invariant so as to avoid a spurious regression. Under the null hypothesis that $\alpha = 1$ for stationary, we use the ADF test statistics to verify the presence of unit root in the series.

The results above show tests for stationary and autocorrelation after transformation of the time series data. This is in effort to make sure that the outcome of the overall result will not be spurious, unreliable and misleading. The results show that the computed ADF test-statistics for all the variables (GR, EXRT, EXP, INF, MS, CAPU and FDI) are smaller than the critical values at 1%, 5% and 10% significant levels and the Durbin-Watson statistics are very significant and approximately 2, which means there is no autocorrelation problems in the time series data and prove that the result is reliable.

Table 4.8: Regression Result

Dependent Variable: D(LOGGR(-1)
Method: Least Squares
Date: 15/04/17 Time: 13:55
Sample: 1970-2015
Included Observations: 46

	Coefficient	Std. Error	t-Statistic	Prob
C	-0.083467	0.087489	-0.954025	0.3527
DLOG(EXRT(-1)	0.068595	0.039857	1.721009	0.0024
DLOG(GEXP(-1)	0.025450	0.006052	4.205461	0.0002
DLOG(INF(-1)	0.000190	5.00E-05	-3.811704	0.0006
DLOG(MS(-1)	5.67E-05	1.51E-05	3.757570	0.0007
DLOG(CPU(-1)	-0.006919	0.003754	-1.842949	0.0749
DLOG(FDI(-1)	0.012686	0.004581	2.769490	0.0094

R-squared	0.579323	Mean dependent var	3.791134
Adjusted R-squared	0.511003	S.D. dependent var	1.252650
S.E. of regression	0.529971	Akaike info criterion	1.676179
Sum squared resid	6.460000	Schwarz criterion	1.821344
Log likelihood	-0.49033	Hannan-Quinn criter.	1.717981
F-statistic	58.33370	Durbin-Watson stat	1.601374
Prob(F-statistic)	0.000400		

Authors' computation (2019)

As shown in the table 4.8 the impact of exchange rate, net export, money supply and foreign direct investment were positive and significantly related to growth in the Nigerian economy. Only inflation rate and capacity utilization had negative nexus with economic growth, however, the variables were significant. This was also confirmed by the probability values. The coefficient of determination as revealed by R-square (R^2) indicates that 58% of the systematic variations in the dependent variable were explained by variations in the independent variables. The probability of F-statistic (0.000400) reveals that the overall regression is significant and passes the goodness of fit test.

4.2 Test of Co-integration

We can infer that there exist a long run relationship between the dependent variable and the independent variables. In order to verify this hypothesis, we use the Augmented Engle-Granger (AEG) co-integration test. This test makes use of the residuals generated from the co-integrating regression and subjects it to unit root test using the Augmented Dickey-Fuller (ADF) test.

The AEG test is specified as: $\Delta\mu_t = \delta\mu_{t\,-1} + \sum \alpha i \Delta\mu_{t-1} + \ell_t$

Where; μ is the generated residual series and ℓt is pure white noise error. The hypothesis to be tested is: Ho: $\delta = 0$ (non-co-integration), H_1: $\delta \neq 0$ (co-integration), the result is presented below:

Table 4.9: Result of Co-integration Test

Variable	ADF statistic		Critical values	
		1%	5%	10%

Residual (μ_t)	-4.145516	-3.6228	-2.9446	-2.6105

Authors Computation (2019)

From the result obtained, we therefore reject Ho and conclude that there exist co-integration among the variables, that is, there is a long-run relationship among the variables of the model at the chosen critical level.

4.3The Error Correction Model (ECM)

The existence of co-integration among the variable of the model which we verified above necessitates the need for the postulation of the error correction model (ECM). This model aims to link the short run dynamics with the long-run equilibrium the result of the ECM is presented below.

Table 4.10: Result of the Error correction model

Dependent variable: DLOG (GR).

Variable	Coefficient	Std. Error	t-statistic	Probability
C	0.031238	0.015978	1.955105	0.0599
D(EXRT)	0.013803	0.005890	2.343573	0.0259
D(EXP)	-9.41E-05	4.40E-05	-2.140235	0.0406
D(INF)	-1.08E-05	1.58E-05	-0.682625	0.5001
D(MS)	-0.003360	0.001588	-2.115853	0.0428
D(CAPU)	-0.002548	0.003612	0.705384	0.4860
D(FDI)	0.040715	0 .014603	2.788147	0.0086
ECM_{t-1}	-0.1785507	0.72896	-4.543232	0.0001

Authors' Computation (2019)

R^2 = 0.502682 F-statistic = 5.053938

Adjusted R^2=0.403219 D-W statistic=1.407372

4.4 The Error Correction Model

In the ECM, the coefficient of the differenced variables reflects the short run dynamics. In this model, all the variables conform to the priori expectation. Also all the variables are statistically significant except for the INF and CAPU. The Error Correction Mechanism (ECM_{t-1}) is also negative which conform to a priori expectation. The negative value of the ECM implies that economic growth is above equilibrium and will start falling in the next period to correct the equilibrium error. The coefficient of -0.785507 implies that about 79% of the equilibrium error will be corrected in the next period. That is, GR will adjust to equilibrium by about 79% in the next period. The speed of adjustment of the ECM is sufficiently high to correct the imbalance in the macroeconomic fluctuation.

4.5Policy Implications

Policy implications arising from this study are that all the variables namely exchange rate, export, inflation rate, money supply, capacity utilization and foreign direct investment affect the economic growth (GR) in the Nigeria macroeconomic environment. It demonstrates the need for a monetary policy framework that complements the already existing policy. The empirical results show that there is a direct and positive relationship between inflation, exchange rate, import and export as well as the gross domestic product in Nigeria.

During the oil boom of the 1970's, which led to greater output growth, huge income was generated. This realized income was not used to expand its industry-based capacity which led the country to spend heavily on mostly imported goods. Also the deregulation of the external sector during the IMF/World Bank orchestrated Structural Adjustment Programme (SAP) of 1986 is another point here. Hence, the international competitiveness of the economy continues to decrease, which further led to decline in economic growth.

Although the economic impact of EXRT on GR in Nigeria is very small, it is however statistically significant. This result indirectly shows the magnitude of the impact of the foreign exchange market to the growth of the economy.

However, the result shows that it has little impact on the Nigerian economy. This may be as a result of the fact that the exchange market in Nigerian is largely dominated by the parallel market which is regarded as part of underground economy and not accounted in the national income computation. Also, the sign of real exchange rate is positive. This may be as a result of inconsistency in government policies with regard to exchange rate.

5. Conclusion and Recommendation

There is urgent need for Nigeria to diversify her product and export opportunities so as to become price giver and not a price taker in the international market. This study also suggests that further studies investigate the relationship between export of goods/services, foreign direct investment, international investment in the Nigeria capital market and movements in exchange rate in Nigeria.

References

Adewuyi, (2002). Balance of Payments Constraints and Growth Rate Differences under Alternative Police Regimes. *Nigerian Institute of Social and Economic Research (NISER) Monograph Series No. 10,* Ibadan, Nigeria.

Adebiyi, M. A. (2007). An Evaluation of Foreign Exchange Intervention and Monetary Aggregates in Nigeria (1986-2003). *The University of Munich Finance Journal, 4 (2),1-19.*

Aghin, P.; Bacchetta, P.; Ranciere, R. & Rogoff, K. (2006). Exchange rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics,* 56 (4), 494–51.

Bonser-Neal, C. & Tanner, G. (1996). Central Bank Intervention and Volatility of Exchange Rates: Evidence from the Options Market. *Journal of International Money and Finance, 18 (2), 23-45.*

Dominguez, K. (1990). Market Responses to Coordinated Central Bank Intervention. *Carnegie Rochester Conference Series on Public Policy, 32*

Dominguez, K. (1998). Central Bank Intervention and Exchange Rate Volatility. *Journal of International and Finance, 15 (4).*

Dominguez, K & Frankel, J. A. (1993). Does Foreign Exchange Intervention matter? The Portfolio effect. *American Economic Review, 83 (5), 231-259*

Dubas, J.M., Lee, B.J., & Mark, N.C. (2005). Effective Exchange Rate Classifications and Growth. *NBER Working Paper No. 11272*

Frankel, J.A. ((1992). In search of the Exchange rate Premium: A Six-Currency Test assuming mean-variance optimization. *Journal of International Money and Finance,1(2),19-32*

Gosh, A. (1992). Is it Signinaling? Exchange Rate intervention and the Dollar Deutssche-Mark Rate. *Journal of International Economics, 32(4), 45-67*

Granger, C.W.J. & Newbold, P. 1974). Spurious regression in Econometrics, *Journal of Econometrics* 2 (4) 111-120.

Harris R.G. (2002). New Economy and the Exchange Rate Regime. *Centre for International Economics Studies, Discussion paper, No 111.*

Humpage, O. (1989). On the Effectiveness of Foreign Exchange Market Intervention. *Federal Reserve Bank of Cleveland.*

Kaminsky, G & Lewis, K (1996). Does Foreign Exchange Intervention signal future monetary policy? *Journal of Monetary Economics, 37(2), 66-89*

Nwankwo (G.O) (1980). Money and capital markets in Nigeria Today. *University of Lagos Press, Nigeria.*

Odusola A.F. and Akinlo, A.E. (2001). Output, Inflation, and Exchange Rate in Developing Countries: An Application to Nigeria. *Developing Economies,* 39(2).

Oloyede, J. A. (2002). Principles of International Finance. *Forthright Educational Publishers,* Lagos.

Rano-Aliyu S.U. (2009). Impact of Oil Price Shock and Exchange Rate Volatility on Economic Growth in Nigeria: An Empirical Investigation. *Research Journal of International Studies 10(4)* 23-45.

Rognoff, K. (1984). The effects of sterilized intervention: An analysis of weekly data. *Journal of Monetary Economics, 2 (2),* 14-34.

Sarno, L. & Taylor, M. P. (2001). Official intervention in the Foreign Exchange Market: Is it effective, and if so, how does it work? *Journal of Economic Literature, 3(1),* 39-56.

Simatele, M.C.H.(2003). Financial Sector Reforms and Monetary Policy in Zambia. Ph.D Dissertation, Economics Studies, Department of Economics, School of Economics and Commercial Law, Goteborg University.

Unugbro, A.O (2007). The Impact of Exchange Rate Fluctuation on Capital Inflow: The Nigerian Experience. *The Nigeria Academic Journal of Social Sciences, 6(4),*1-21

Appendix

Table 4.1
Null Hypothesis: D(LOGGR) has a unit root
Exogenous: Constant

		t-Statistic	Prob*
Augmented Dickey-Fuller test statistic		-1.417410	0.0009
Test critical values:	1% level	-3.459898	
	5% level	-2.874435	
	10% level	-2.573719	

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.994982

Table 4.2
Null Hypothesis: D(LOGEXRT) has a unit root
Exogenous: Constant

		t-Statistic	Prob*
Augmented Dickey-Fuller test statistic		-4.781273	0.0009
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

*McKinnon (1996) one-sided p-values
Durbin- Watson Statistics 1.994982

Table 4.3
Null Hypothesis: D(LOGGEXP) has a unit root
Exogenous: Constant

		t-Statistic	Prob*
Augmented Dickey-Fuller test statistic		-4.781273	0.0009
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.994982

Table 4.4
Null Hypothesis: D(LOGINFR) has a unit root
Exogenous: Constant

	t-Statistic	Prob*
Augmented Dickey-Fuller test statistic	-4.781273	0.0009

Test critical values:	1% level	-3.737853
	5% level	-2.991878
	10% level	-2.635542

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.994982

Table 4.5
Null Hypothesis: D(LOGMS) has a unit root
Exogenous: Constant

	t-Statistic	Prob*
Augmented Dickey-Fuller test statistic	-4.781273	0.0009

Test critical values:	1% level	-3.737853
	5% level	-2.991878
	10% level	-2.635542

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.994982

Table 4.6
Null Hypothesis: D(LOGCAPU) has a unit root
Exogenous: Constant

	t-Statistic	Prob*
Augmented Dickey-Fuller test statistic	-4.781273	0.0009

Test critical values:	1% level	-3.737853
	5% level	-2.991878
	10% level	-2.635542

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.994982

Table 4.7
Null Hypothesis: D(LOGFDI) has a unit root
Exogenous: Constant

	t-Statistic	Prob*
Augmented Dickey-Fuller test statistic	-5.612410	0.0001

Test critical values:	1% level	-3.737853
	5% level	-2.991878
	10% level	-2.635542

*McKinnon (1996) one-sided p-values
Durbin- Watson Stat 1.9487480