©IDOSR PUBLICATIONS
International Digital Organization for Scientific Research ISSN:2579-0781
IDOSR JOURNAL OF EXPERIMENTAL SCIENCES 2(1):86-112, 2017.

The Response of the Nigerian Economy to Changes in Exchange Rate Policies (1981-2015)

Oleka Dorothy Chioma and Nwankwo Mary Ebere

Department of Banking and Finance, Enugu State University of Science and Technology

ABSTRACT

The study focused on the effect of changes in exchange rate regime systems on the Nigerian economy for the period 1981 to 2015 using the multiple linear OLS regression technique. Specifically, the study examined the effect of fluctuations in exchange rate on gross domestic product and the effect of exchange rate regime changes on gross domestic product in Nigeria. The study found that fluctuation in exchange rate has a significant positive effect on gross domestic product in Nigeria. The study also found that changes in exchange rate regime systems have a significant positive effect on gross domestic product in Nigeria with flexible regime system periods having more effect. Based on the findings, the study recommends that growth in gross domestic product, and increase in exportable should be ranked in the primary list of formulating an exchange rate policy.

Keywords: Economy, Exchange rate, GDP and Nigeria.

INTRODUCTION

Managers of monetary policy in Nigeria and the rest of the world in their pursuit of macroeconomic stability have often set targets on intermediate variables such as short term interest rate, growth of money supply and exchange rate. Among these variables the exchange rate is argued to have a greater influence on the economy through its effect on the value of domestic currency, domestic inflation, the external sector, macroeconomic credibility, capital flows and financial stability [1]. Therefore, the management of exchange rate is derives from the fact that for most countries, the prevailing objective of monetary policy is price stability.

According to Dada and Oyeranti, (2012) [2], an exchange rate is simply the price of one currency in terms of another. The process by which that price is determined depends on the particular exchange rate regime adopted. Nigeria like many other countries of the world

has adopted different exchange rate regimes namely fixed and flexible regimes. According to Adoye and Saibu (2014)[1], exchange rate regime varies with the level of financial development, but the choice of exchange rate regime across countries of the world stands as one of the most contentious aspect of macroeconomic policy. But the choice of exchange rate regime involves considerations that extend beyond the stability or otherwise of currency prices.

Exchange rate in Nigeria has gone through many changes but spanning between two major regimes. These are fixed and floating exchange rate systems. The transitions have been from a fixed regime in the 1960s to a pegged regime between the 1970s and the mid-1980s and finally, to the various variants of the floating regime from 1986 with the deregulation and adoption of the structural adjustment programme (SAP) [3]. However, the era of floating exchange rate system is not a new system, On September 26, 1986, the naira was first floated in the second-tier foreign exchange market (SFEM), and a dual exchange rate mechanism, a combination of the first and second-tiers exchange rate system, was introduced. While the first-tier exchange rate was administratively determined and used for official transactions including debt service payments, expenditures on Nigerian missions and public sector transactions, the floating exchange rate was used for determining the value of other transactions using major pricing methods such as averaged successful bids, marginal rate and Dutch Auction System (DAS). The dual exchange rate system resulted in multiplicity of rates which encouraged subsidy element with attendant fluctuations. The system was latter jettisoned and the two rates were merged into a single enlarged Foreign Exchange market (FEM) on July 2, 1987. With the failure of the Autonomous Foreign Exchange Market (AFEM), introduced in 1995, an Inter-Bank Foreign Exchange Market (IFEM) was introduced on October 25, 1999.

Recently, the Monetary Policy Committee of the Central bank of Nigeria on the 23rd of May 2016 rising from its 255th meeting in Abuja decided to retain its monetary policies but took a critical position of reversing its stance on floating exchange rate. Having adopted a

fixed foreign exchange rate policy for close to two years, the CBN saw it as been important to change direction as the external reserves of the country became leaner in a foreign exchange regime that saw a wide margin between official and parallel market rates (Idowu, 2016)[4]. According to the governor of the CBN, Godwin Emefiele, this becomes necessary because the foreign exchange reserves can no longer satisfy all the demands for FOREX. The external reserves had consistently been depleted in the past months shedding a total of $2.45 million or 8.46 per cent since the beginning of the year. As at January 4, 2016, the reserves was $28.957 billion but had consistently trended downwards to $26.51 billion as at Monday, May 23, 2016.

Experts say a floating foreign exchange policy is a self-adjusting mechanism or automatic stabilizers to restore balance of payment equilibrium allowing government to put more effort in tackling internal problems of inflation, unemployment and other such issues. Also because monetary policies affect inflation rates, a flexible foreign exchange policy call allow for the implementation of autonomous monetary policies that addresses the problem of inflation and output which will eventually lead to improvement in economic development [4].

This study is important at this time when the country is undergoing a tough time with Naira depreciating in value daily. Studying the responsiveness of economic development to floating exchange rate regime is important due to the fact that, it will help policy makers to know whether there is a stable long-run relationship between the system and economic development. Also, this study may help traders and investors to know when to adjust and respond accordingly depending on the prevailing exchange rate and monetary policy link.

STATEMENT OF PROBLEM

Empirical cross-country studies have yielded ambiguous results with respect to the impact of different exchange rate regimes on macroeconomic performance particularly output growth. In practice, a stable exchange rate has generally been a byproduct of other policy

choices, rather than of a particular form of exchange rate regime. According to Akinlo and Adejumo (2014) [5], if fixed exchange rate regimes benefit from short-term flexibility within margins, as well as scope for longer-term adjustment, the difference between fixed and floating exchange regimes may become largely a matter of announcement. He further opined that the announcement effect of a fixed rate regime has not been based solely on the adoption of the regime itself but has also depended on whether monetary and exchange rate decisions have been assigned separately to more than one official institution. It has therefore varied from country to country, depending on the institutional arrangements.

However, macroeconomic environment have no doubt changed dramatically since Nigeria government embarked on exchange rate reforms in the middle of 1980s. One of the most important ingredients of the reforms programmes which have generated a lot of inconclusive controversies is the movement from fixed exchange rate to flexible exchange rate system [6]. It has had obvious implications for specific macroeconomic variables, including trade, balance of payment position, private domestic investment, inflationary trend, export and import, purchasing power and economic growth to mention a few [2]. At firm level for instance, exchange rate movements and its volatility had led to poor performances of economic growth in Nigeria which has contributed to the declining economic growth in the country in recent times.

However, there is no fixed agreement on choosing the most suitable exchange rate to maintain macroeconomic stability. The choice of an appropriate exchange rate system must depend on the particular features of each country. Free floating exchange rate regimes adopted by developed countries might not suit developing countries whose insurance markets are not so well developed and whose economy is not stable enough to absorb the risks from exchange rate volatility. Therefore, in theory, if the right regime is adopted, it

could facilitate better business climate and potentially enhance economic growth in the long run.

Economic theory does not clearly articulate how exchange rate regimes can affect economic growth, and there are a limited number of studies which investigate this relationship. Most studies focus on how exchange rate impact international trade and investments and have brought out arguments that have not been resolved. For instance, the study of Levy-Yeyati and Sodersten (1998) [7], explored the implications for macroeconomic variables of choosing a particular exchange rate arrangement by assessing the impact of exchange rate regimes on inflation, money growth, real interest rates, and real output growth. They found that the correlation between exchange rate and output growth existed, even though the influence might not be very clear. Also, the study of conducted by Huang and Mundell (1968) [8], in 12 developing Asian countries and 18 advanced European countries over the period of 1976-2001 made interesting scholarly arguments. Firstly, they discovered that the choice of exchange rate regimes did not have significant impact on economic growth in European nations, although more flexible regimes were associated with higher growth. Secondly, developing countries in Asia which adopted managed float seemed to outperform other countries in the area which adopted different regimes. Therefore, their study argued that exchange rates do impact economic growth but may depend on how developed the economy is. All these assertions and arguments have not empirically settled in Nigeria which is the basis for this study.

OBJECTIVES OF THE STUDY

The main aim of the study is to examine the impact of floating exchange rate system on economic development in Nigeria. The specific objectives are:

i. To determine if Nigerian economy respond to fluctuations in exchange rate.

ii. To examine the extent of effects that changes in different exchange rate regime systems has on gross domestic product in Nigeria.

RESEARCH QUESTIONS

i. What is the magnitude of effect that fluctuations in exchange rate have on the Nigerian economy?

ii. What is the extent of effect that changes in exchange rate regime system has on gross domestic product in Nigeria?

HYPOTHESIS OF THE STUDY

H_0: Changes in exchange rate have no significant positive effect on gross domestic product in Nigeria.

H_0: Changes in exchange rate regime system has no significant positive effect on gross domestic product in Nigeria.

THE SCOPE OF THE STUDY

The scope of the study is from 1981 to 2015, this chosen period reflects the period the country adopted both fixed and floating exchange rate system in Nigeria.

SIGNIFICANCE OF THE STUDY

The study will be of great relevant for number of reasons: the changing character of monetary policy especially, the exchange rate and the declining economic growth in recent times.

GOVERNMENT AND POLICY MAKERS

The recent crude oil price fall has affected the foreign exchange of many oil producing countries and have caused policy makers around the world to be very cautious with macroeconomic instability. This study would add to knowledge of the effect of this oil market crisis on exchange rate of Nigeria by looking at appropriate policy interventions to boost the exchange rate and output growth.

RESEARCHERS AND STUDENTS

The study will help researchers and students to update their knowledge gap as it concerns the issue of exchange rate fluctuation and output growth.

GENERAL PUBLIC

The study will help the general public to invest more in export oriented products as to improve the exchange rate and economic growth and also advocate for an adequate exchange rate policy system.

LIMITATIONS OF PREVIOUS STUDIES

Although, there are many empirical studies on the determinants of exchange rate and its impact on economic growth, however the existing evidence suggests that research in this area is promising. The researcher noted the following: First, none of the studies among the one reviewed made any attempt to differentiate periods of fixed and floating regimes in their model and analysis. There is no data on fixed and floating exchange rate in Nigeria and there have been a mix of the two between periods since 1981 till date.

Second, past studies had short fall in methodology issue, they did not check for structural break between the periods of change in regimes

RESEARCH METHODOLOGY

RESEARCH DESIGN

The study will use the *Ex Post Facto* Research Design. This is necessary because the study will use existing data to predict future outcomes. *Ex-post facto* research design is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulated [8, 9, 10]. Inferences about relations among variables are made, without direct investigation of independent and dependent variables.

The study will make use of descriptive analysis and the econometrics research design for addressing the objectives of the study. The researcher will adopt the multiple regression analysis based on the classical linear regression model, otherwise known as Ordinary Least

Square (OLS) technique to analyze the objectives. For the econometrics model, the specification of the model is based on the empirical work of [14], who conducted a study with the objective of comparing the impact of the fixed and flexible exchange rate systems on the Nigerian economy from (1960-2007) with the use of ordinary least square.

NATURE OF THE DATA

The data is a time series secondary data showing aggregate data for the Nigerian economy.

MODEL THEORETICAL BACKUP

Basically, there are many theoretical schools of thought that attempt to explain the behavior of exchange rate policies as it relates to output. However, the notable guiding the methodology of this study is the IS-LM framework. The framework was developed based on the assumption of fixed money wages and prices which implies a perfectly elastic aggregate supply curve where output is determined by the position of the aggregate demand curve [11, 12, 13]. The main advantage of this model over some other models is that it includes consumption, investment, government spending, taxes, exports, imports, interest rate, exchange rate, current account, capital account and national output in a single framework. One other theoretical linkage between exchange rate and output in the literature is the IS-LM model. The model was developed based on the assumption of fixed money wages and prices which implies a perfectly elastic aggregate supply curve where output is determined by the position of the aggregate demand curve. The main advantage of this model over some other models is that it includes consumption, investment, government spending, taxes, exports, imports, interest rate, exchange rate, current account, capital account and national output in a single framework. In this model exchange rate does not affect output directly, it affect it indirectly through the import-export and the money supply channels [13].

DATA COLLECTION

In order to identify and determine the relationship between floating exchange rate and economic development in Nigeria, this study will use secondary data collected from central bank of Nigeria (2015 bulletin).

MODEL SPECIFICATION

The study will use the ordinary least square (OLS) regression technique in analyzing the study. Following the empirical work of [1], the functional form of the model for the study is;

LOG(GDP) = f (REGIMEP, EXCHR, INF)..... 3.1

Equation 3.1 is transformed to;

$LOG(RGDP)_t = \beta_0 + \beta_1(REGIMEP)_t + \beta_2(EXCHR)_t + \beta_3(INF)_t + \mu_t$ **..... (3.2)**

Where:

LOG(GDP) is log of gross domestic product.

REGIMEP is the years the country practiced the different exchange rate regimes-the country practiced fixed exchange rate from 1981-1985, 1988-1989 (The country practiced a system with the US dollar as the currency of intervention (1989). (CBN Briefs, 2009), 1994 (regulated economy).

The various periods of flexible exchange rate system are; (1986 – 1987, 1995 – 1999) Guided deregulation period (1995 – 1998). Full deregulation under the inter-bank foreign exchange market (1999 – 2003). The retail Dutch auction system (1987, 1990 and 2002). The wholesale Dutch auction system (2006 – 2015), (CBN briefs, 2015).

Since time series review of these periods is not consistent, it is not possible to estimate a particular exchange regime from certain periods of time. Thus, the researcher used qualitative data to estimate regime periods, with fixed regime taking 1 and floating regime taking 2.

EXCHR is floating exchange rate and the control variable INF is inflation.

EVALUATION OF ESTIMATES

Test of Goodness of fit (R^2) also known as the coefficient of multiple determinations will be performed after the determination of the regression line. The goodness of Fit, illustrated by R^2 shows to what extent the independent variables or regressors explain the dependent variable.

The F-Test is used in testing the overall statistical significance of the variables in the model. It could be inferred from the F probability wherein the model is significant at 5% when F probability is less than 0.05, or by comparing the F estimated with the F tabulated.

THE PROBABILITY RATIO

The t-test probability ration shows the significance of the coefficient of each independent variable. Decision rule: An independent variable (parameter) is said to be statistically significant (or a hypothesis is said to be rejected) at 5% when the probability value is less than 5% (0.05).

RESULT PRESENTATION AND ANALYSIS

This chapter presents regression result and the analysis. This is done using the multiple OLS (ordinary least square regression result) as shown in the table below.

DATA PRESENTATION

The data used in the regression estimation is presented below. RGDP is regressed in log form because of the size of the digits in billions. The data is sourced from the 2015 CBN statistical bulletin. It stops at 2015 because CBN has not released the 2016 data.

year	Exchr	Infl	Regimep	RGDP
1981	0.62	21.4	1	205222
1982	0.67	7.2	1	199685.3
1983	0.7244	23.2	1	185598.1
1984	0.767	40.7	1	183563
1985	0.89	4.7	1	201036.3
1986	1.75	5.4	2	205971.4
1987	4.016	10.2	2	204806.5
1988	4.53	56	1	219875.6
1989	7.36	50.5	1	236729.6
1990	8.04	7.5	2	267550
1991	9.9095	12.7	2	265379.1
1992	17.298	44.8	2	271365.5
1993	22.065	57.2	2	274833.3
1994	21.996	57	1	275450.6
1995	21.895	72.8	2	281407.4
1996	21.884	29.3	2	293745.4
1997	21.886	10.7	2	302022.5
1998	21.886	7.9	2	310890.1
1999	92.34	6.6	2	312183.5
2000	101.697	6.9	2	329178.7
2001	111.231	18.9	2	356994.3
2002	120.578	12.9	2	433203.5
2003	129.22	14	2	477533
2004	132.89	15	2	527576
2005	131.27	17.8	2	561931.4
2006	128.65	8.2	2	595821.6
2007	125.81	5.4	2	634251.1
2008	118.55	11.6	2	672202.6
2009	148.9	12.4	2	718977.3
2010	150.2	13.3	2	775525.7
2011	153.9	10.9	2	834161.8
2012	157.49	12.2	2	888892.9
2013	157.31	8.5	2	950114
2014	158.5526	8	2	1009239
2015	195.5158	9.5	2	1037361

Source: 2015 CBN statistical bulletin

PRESENTATION OF REGRESSION RESULT

	Dependent Variable: LOG(RGDP)			
Variables	Coefficient	Std. Error	T-statistics	Probability
Constant	12.07909	0.157981	76.45934	0.0000
EXCHR	0.007807	0.000579	13.47709	0.0000
INFL	0.001460	0.001861	0.784438	0.4387
REGIMP	1.099295	0.087603	12.54859	0.0000
R-squared	0.906993			
Adjusted R^2	0.897993			
Prob(F-statistics)	0.0000		Durbin-Watson Stat	1.57894

Source: Authors computation

TEST OF HYPOTHESES

H_0: Exchange rate fluctuation has no significant positive effect on gross domestic product in Nigeria.

H_0: Changes in exchange rate regime system has no significant positive effect on gross domestic product in Nigeria.

HYPOTHESIS ONE

H_0: Exchange rate fluctuation has no significant positive effect on gross domestic product in Nigeria.

The coefficient of exchange rate has a probability value of 0.0000 which is below the 5% probability level. Thus, the hypothesis that exchange rate fluctuation has no significant positive effect on gross domestic product in Nigeria is rejected. This implies that fluctuations in exchange rate have a positive effect on gross domestic product in Nigeria. A unit increase in exchange rte will increase GDP by 0.7 percent (since GDP is in log form).

This finding agrees with that of Yimka, Adekunle and Anthony, 2014)[14], who empirically examined the effect of foreign exchange regimes on industrial growth in Nigeria, using

secondary data covering the period of 1985 to 2005. And found that exchange rate has a significant effect on the Economics Growth. However, this finding does not correspond with that of Dada and Yaqub, (2010)[13], who analysed the impact of exchange rate on macroeconomic aggregates in Nigeria, based on the annual time series data for the period 1970 to 2009. They found that there is no evidence of a strong direct relationship between changes in the exchange rate and GDP growth.

HYPOTHESIS TWO

H_0: Changes in exchange rate system has no significant positive effect on gross domestic product in Nigeria.

The qualitative variable representing exchange rate regime periods was divided into 1 for periods of fixed exchange rate regime and 2 for period of flexible exchange rate regime. It is significant as its probability value is 0.0000 which means that the hypothesis that changes in exchange rate regime system has no significant effect on gross domestic product in Nigeria is rejected. Thus, changes in exchange regimes (fixed or flexible) affect the Nigerian economy.

To find the size of exchange rate during these two periods, we plot in the values into the equation. The equations for the two periods are stated thus;

$RGDP = \beta_0 + \beta_1 REGIMEP$

FIXED REGIME PERIOD

RGDP = 12.07909 + 1.099295(1)

RGDP = 13.178385

FLEXIBLE REGIME PERIOD

RGDP = 12.07909 + 1.099295(2)

RGDP = 12.07909 + 2.19859

RGDP =14.27768

The result shows that flexible exchange regime period have more positive effect on gross domestic product than fixed regime system.

The above findings in hypothesis two agrees with the findings of Yimka, Olusegun and Anthony (2014)[14] who examined the impact of floating Exchange rate regime on economic growth in Nigeria covering the period of between 1986 and 2015, using secondary sources of data. They found that exchange rate has positive impact on economic growth.

The same finding is upheld by Yimka, Olusegun and Anthony (2014)[14] who investigated the effect exchange rate regimes had on non-oil export revenue. They specifically ascertained the effects of some macroeconomic variables (inflation, price index, gross domestic product (GDP), exchange rate and degree of openness) had on non-oil export revenue in Nigeria as well as the performance of the non-oil export sector over the period 1986 to 2010. Using annual data from 1986 to 2010. They discovered that exchange rate, degree of economic openness, GDP inflation rate and price index collectively accounts for 97.7 per cent variations in non-oil export variations. Moreover, it also corresponds with Yimka, Olusegun and Anthony (2014)[14] who conducted an empirical study with the objective of comparing the impact of the fixed and flexible exchange rate systems on the Nigerian economy from (1960-2007). Results show that the fixed exchange rate system has had a significant positive impact on GDP. The flexible exchange rate system on the other hand, has had a significant positive impact on GDP and a insignificant negative impact on balance of payments.

CONCLUSION AND RECOMMENDATIONS

The study focused on the effect of changes in exchange rate regimes on economic growth in Nigeria for the period 1981 to 2015. The study made the following findings:

1. Fluctuations in exchange rate in Nigeria have a positive significant effect on the gross domestic product (used to proxy economic growth in Nigeria).

2. Fixed and flexible exchange regime systems have positive significant effect on economic growth in Nigeria but the magnitude of flexible regime system on economic growth is higher than that of fixed regime system.

CONCLUSION

From the findings above, floating exchange rate is a major factor affecting economic development in Nigeria as it impact o real gross domestic product. Nigeria is a developing country which is in dire need of foreign investment to stimulate domestic economy, seek new technology, modern managerial skills and employment generation for ever increasing population. A right exchange rate policy in this regard can play a decisive role not only to manage difficult economic conditions but it also promotes competition in the economy which brings efficiency leading to the beauty of capitalism; innovation.

RECOMMENDATIONS

Thus, base on the findings above, the policy recommendation of the study is as follows;

i. to minimize the exchange rate volatility and to keep exchange rates in a compatible mode. Any such movement in the exchange rates that leads to the loss of competitiveness should be avoided by proper planning and well regulated foreign exchange market. Economic reforms and policies with stable exchange rate should be promoted in order to bring fresh FDI by revising the exchange controls and developing modern financial markets.

ii. Also, growth in gross domestic product, and increase in exportable should be ranked in the primary list of formulating an exchange rate policy. Constant devaluation, without a vibrant and productive industrial sector, and efficient exporting industry will end up pushing the economy into a tight end.

REFERENCES

1. Adeoye, B. W. and Saibu, O. M (2014), Monetary Policy Shocks and Exchange Rate Volatility in Nigeria. *Asian Economic and Financial Review, 4, (4): 544-562.*

2. Dada, E. A and Oyeranti, O.A (2012), Exchange Rate and Macroeconomic Aggregates in Nigeria. *Journal of Economic and Sustainable Development,* 3,(2).

3. Hoffmann M. (2007). Fixed Versus Flexible Exchange rates: Evidence from developing Countries, Economica, New Series, 74, (295), 245-449

4. Idowu, B (2016) Flexible Exchange Rate For Economic Growth. Leadership Newspaper, May 30th, 2016.http://leadership.ng/blogposts/531731/flexible-exchange-rate-economic-growth.

5. Akinlo, A. E and Adejumo, V. A (2014), Exchange Rate Volatility and Non-oil Exports in Nigeria: 1986-2008. *International Business and Management, 9, (2). 70-79.*

6. Deverux M. and Engel C. (1988) 'Fixed floating exchange rates: how price setting affects the optimal choice of exchange-rate regime,' *National Bureau of Economic Research (NBER) working paper 6867,www.nber.org/papers/w6867.*

7. Sodersten, B. C. (1998), *International Economics* 2nd Edition (Macmillan).

8. Mundell, R., (1968). International Economics, Macmillan, New York.

9. Mckinnon, R.I., (1973). *Money and capital in economic development*, Washington, D.C., The Brookings Institution.

10. Lagat, C. C and Nyandema, D. M (2016) The Influence of Foreign Exchange Rate Fluctuations on the Financial Performance of Commercial Banks Listed at the Nairobi Securities Exchange. *British Journal of Marketing Studies, 4,(3),1-11.*

11. Ogundipe, A. A., Ojeaga, P and Ogundipe, O. M (2013), Estimating the Long Run Effects of Exchange Rate Devaluation on the Trade Balance of Nigeria. *European Scientific Journal September 2013 edition 9,(25), 233-249.*

12. Olufayo, M. B and Fagite, B. A (2014), Exchange Rate Volatility and Sectoral Export of Nigeria: Case of Oil and Non-Oil Sectors. *Journal of Economics and Sustainable Development (Online) 5, (10).*

13. Yaqub, J. O. (2010), Exchange rate changes and output performance in Nigeria. A Sectoral Analysis. *Pakistan Journal of Social Sciences. 7,(5), 380-387.*

14. Yimka, A. S. Adekunle, O. A, and Anthony, J.O (2014), Foreign Exchange Rate Regimes and Non-Oil Export Performance in Nigeria (1986 – 2010). *International Journal of Business and Behavioral Sciences 4,(1).*

Appendix

Null Hypothesis: EXCHR has a unit root				
Exogenous: None				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			1.937925	0.9855
Test critical values:	1% level		-2.634731	
	5% level		-1.951000	
	10% level		-1.610907	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXCHR)				
Method: Least Squares				
Date: 04/18/17 Time: 10:43				
Sample (adjusted): 1982 2015				
Included observations: 34 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCHR(-1)	0.052394	0.027036	1.937925	0.0612
R-squared	-0.047900	Mean dependent var		5.732229
Adjusted R-squared	-0.047900	S.D. dependent var		14.23132
S.E. of regression	14.56818	Akaike info criterion		8.224527
Sum squared resid	7003.649	Schwarz criterion		8.269420
Log likelihood	-138.8170	Hannan-Quinn criter.		8.239836
Durbin-Watson stat	1.856256			

Null Hypothesis: D(EXCHR) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.160587	0.0002
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXCHR,2)				
Method: Least Squares				
Date: 04/18/17 Time: 10:43				
Sample (adjusted): 1983 2015				
Included observations: 33 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCHR(-1))	-1.003033	0.194364	-5.160587	0.0000
C	5.918935	2.714026	2.180869	0.0369
R-squared	0.462101	Mean dependent var		1.118580
Adjusted R-squared	0.447750	S.D. dependent var		19.65585
S.E. of regression	14.64658	Akaike info criterion		8.264982
Sum squared resid	6650.191	Schwarz criterion		8.355680
Log likelihood	-134.3722	Hannan-Quinn criter.		8.295499
F-statistic	26.63166	Durbin-Watson stat		1.860229
Prob(F-statistic)	0.000014			

Null Hypothesis: LOG(RGDP) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.276086	0.4345
Test critical values:	1% level		-4.262735	
	5% level		-3.552973	
	10% level		-3.209642	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(RGDP))				
Method: Least Squares				
Date: 04/18/17 Time: 10:54				
Sample (adjusted): 1983 2015				
Included observations: 33 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(RGDP(-1))	-0.137798	0.060542	-2.276086	0.0304
D(LOG(RGDP(-1)))	0.355621	0.161808	2.197790	0.0361
C	1.647930	0.717974	2.295249	0.0291
@TREND("1981")	0.008494	0.003389	2.506260	0.0181
R-squared	0.373807	Mean dependent var		0.049930
Adjusted R-squared	0.309029	S.D. dependent var		0.047306
S.E. of regression	0.039323	Akaike info criterion		-3.520792
Sum squared resid	0.044843	Schwarz criterion		-3.339398
Log likelihood	62.09307	Hannan-Quinn criter.		-3.459759
F-statistic	5.77054	Durbin-Watson		1.9104

	5	stat	53
Prob(F-statistic)	0.003196		

Null Hypothesis: D(LOG(RGDP)) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.539208	0.0130
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LOG(RGDP),2)				
Method: Least Squares				
Date: 04/18/17 Time: 10:50				
Sample (adjusted): 1983 2015				
Included observations: 33 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(RGDP(-1)))	-0.538219	0.152073	-3.539208	0.0013
C	0.027641	0.010384	2.661758	0.0122
R-squared	0.287782	Mean dependent var		0.001662
Adjusted R-squared	0.264807	S.D. dependent var		0.049212
S.E. of regression	0.042196	Akaike info criterion		-3.434303
Sum squared resid	0.055195	Schwarz criterion		-3.343606
Log likelihood	58.6660	Hannan-Quinn		-

	1	criter.	3.403787
F-statistic	12.52599	Durbin-Watson stat	2.020597
Prob(F-statistic)	0.001290		

Null Hypothesis: INFL has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-2.965521	0.0485
Test critical values:	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INFL)				
Method: Least Squares				
Date: 04/18/17 Time: 10:44				
Sample (adjusted): 1982 2015				
Included observations: 34 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFL(-1)	-0.436302	0.147125	-2.965521	0.0057
C	8.655781	4.064173	2.129777	0.0410
R-squared	0.215577	Mean dependent var		-0.350000
Adjusted R-squared	0.191064	S.D. dependent var		17.51056
S.E. of regression	15.74915	Akaike info criterion		8.408472
Sum squared resid	7937.141	Schwarz criterion		8.498258

Log likelihood	-140.9440	Hannan-Quinn criter.	8.439092
F-statistic	8.794314	Durbin-Watson stat	1.651340
Prob(F-statistic)	0.005671		

Null Hypothesis: REGIMEP has a unit root			
Exogenous: Constant			
Lag Length: 5 (Automatic - based on SIC, maxlag=8)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.782385	0.0078
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	
*MacKinnon (1996) one-sided p-values.			

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(REGIMEP)				
Method: Least Squares				
Date: 04/18/17 Time: 10:44				
Sample (adjusted): 1987 2015				
Included observations: 29 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
REGIMEP(-1)	-0.788094	0.208359	-3.782385	0.0010
D(REGIMEP(-1))	-0.320340	0.162100	-1.976183	0.0608
D(REGIMEP(-2))	-0.721641	0.151851	-4.752299	0.0001
D(REGIMEP(-3))	-0.720349	0.169247	-4.256201	0.0003
D(REGIMEP(-4))	-0.67003	0.147386	-4.546098	0.0002

	0			
D(REGIMEP(-5))	-0.382874	0.143664	-2.665064	0.0141
C	1.591737	0.396418	4.015298	0.0006
R-squared	0.739234	Mean dependent var		0.000000
Adjusted R-squared	0.668116	S.D. dependent var		0.377964
S.E. of regression	0.217743	Akaike info criterion		-0.004497
Sum squared resid	1.043065	Schwarz criterion		0.325540
Log likelihood	7.065201	Hannan-Quinn criter.		0.098867
F-statistic	10.39446	Durbin-Watson stat		2.332432
Prob(F-statistic)	0.000017			

Dependent Variable: LOG(RGDP)				
Method: Least Squares				
Date: 04/18/17 Time: 10:50				
Sample: 1981 2015				
Included observations: 35				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.07909	0.157981	76.45934	0.0000
EXCHR	0.007807	0.000579	13.47709	0.0000
INFL	0.001460	0.001861	0.784438	0.4387
REGIMEP	1.099295	0.087603	12.54859	0.0000
R-squared	0.906993	Mean dependent var		12.84282
Adjusted R-squared	0.897993	S.D. dependent var		0.558001
S.E. of regression	0.178217	Akaike info criterion		-0.504414

Sum squared resid	0.984606	Schwarz criterion	-0.326659
Log likelihood	12.82724	Hannan-Quinn criter.	-0.443053
F-statistic	100.7698	Durbin-Watson stat	1.578947
Prob(F-statistic)	0.000000		

Data used for regression

year	Exchr	Infl	Regimep	RGDP
1981	0.62	21.4	1	205222
1982	0.67	7.2	1	199685.3
1983	0.7244	23.2	1	185598.1
1984	0.767	40.7	1	183563
1985	0.89	4.7	1	201036.3
1986	1.75	5.4	2	205971.4
1987	4.016	10.2	2	204806.5
1988	4.53	56	1	219875.6
1989	7.36	50.5	1	236729.6
1990	8.04	7.5	2	267550
1991	9.9095	12.7	2	265379.1
1992	17.298	44.8	2	271365.5
1993	22.065	57.2	2	274833.3
1994	21.996	57	1	275450.6
1995	21.895	72.8	2	281407.4
1996	21.884	29.3	2	293745.4
1997	21.886	10.7	2	302022.5
1998	21.886	7.9	2	310890.1
1999	92.34	6.6	2	312183.5
2000	101.697	6.9	2	329178.7
2001	111.231	18.9	2	356994.3
2002	120.578	12.9	2	433203.5
2003	129.22	14	2	477533
2004	132.89	15	2	527576
2005	131.27	17.8	2	561931.4
2006	128.65	8.2	2	595821.6

2007	125.81	5.4	2	634251.1
2008	118.55	11.6	2	672202.6
2009	148.9	12.4	2	718977.3
2010	150.2	13.3	2	775525.7
2011	153.9	10.9	2	834161.8
2012	157.49	12.2	2	888892.9
2013	157.31	8.5	2	950114
2014	158.5526	8	2	1009239
2015	195.5158	9.5	2	1037361

Source: 2015 CBN statistical bulletin