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A Logarithmic Analysis of Nigeria's Monetary Policy Thrust and GDP: 1980-2015

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***Abstract*:** This study aims to determine the thrusts of variations in the Central Bank of Nigeria (CBN) monetary policies from 1980-2015 and its effects on Nigeria's GDP. Results show that the CBN had an unclear and non-directional monetary policy thrust in the pre-SAP, SAP and post-SAP eras, and a clear directional monetary thrust policy in subsequent periods: easy and tight policy thrusts in the consolidation and post-global economic crisis eras respectively. OLS analysis of logarithmic values of data on GDP, CRR, MPR, LR and LDR for the study period shows that a positive relationship exists between GDP and CRR; and negative relationships exist between GDP and MPR, LR and LDR. These findings make evident the need for Nigeria's monetary regulators to harmonize the direction of variations in monetary policy instruments; increase CRR and reduce MPR, LR and LDR to improve economic growth in the country and eliminate unethical banking practices with negative consequences on the financial sector, the economy and the entire country.

***Keywords*:** Gross Domestic Product, cash reserve ratio, liquidity ratio, loan to deposit ratio, monetary policy rate, monetary policy thrust, cash crunch

Introduction

Variation of monetary policies by central banks aims to achieve short, medium and long-term goals of employment generation, increase in economic activities, reduction in inflation, increase in production capacity utilization and gross domestic product (GDP). Arguments abound in literature of the practical functions of these banks. Kandil (2014) noted that beliefs in economies hold that central

banks in developing economies are created with the main objective of financing government deficits. Studies on monetary policies (Sala, 2008; Kilponen and Leitemo, 2008; Chapman, 2008; Jones, 2008; Sahuc and Smets, 2008; Kumah, 2007; and Kamar and Naceur, 2007) differentiated between monetary policies of studied economies: the stabilizing and the accommodative policies. They observed that an accommodative policy provides regular supply of credit for a growing economy, while the policy aimed at stabilizing is used to offset undesired changes affecting the economy. The stabilization function of central banks, according to Kandil (2014) is targeted at growth by increasing liquidity to expand credit in periods of economic downturns. This growth expansion he argued is through fluctuations in monetary policies via growth in aggregate demand; which itself depends on the liquidity effects caused by change in money supply and the sensitivity of aggregate demand to the change in liquidity. The change in demand is allocated between output growth and price inflation and this seems dependent on the constraints on the supply side of the economy.

Though varied arguments exists about the effect of monetary policy on economic performance, Kandil (2014) asserts that this performance depends on monetary variability; contending that cross-country evidences shows that trend output increases with increased response of real economic growth to monetary shocks. Output variability on the other hand, he added, decreases with the higher the response of real growth to monetary policy shocks. Consensus exists among monetary theorists that a reduction in monetary policy rate reduces interest rate and induces capital outflow and reduces inflows. Foreign exchange reserves may be depleted in such circumstances to meet foreign exchange requirements for outflows, decreasing an economy's monetary base. Increase in cash reserve ratio and ratio of loans to deposits increases cash crunch, reduce spending and consumption with negative spiral effects on output.

From the money supply side, the effectiveness of monetary policy on an economy decreases with the increase in the response of money demand to income. Thus, with an increase in money supply in response with variation in monetary policy, higher level of money demand due to increase in income closes disequilibrium gap and decrease the necessary reduction in interest rate (Kandil, 2014). Conversely, the effectiveness of monetary policy will increase a less responsive money demand to change in interest rate, making a high level of reduction in monetary policy rate (and thus interest rate) with an increase in money supply. The economy will thus gain when there exists a high level of positive sensitivity of aggregate demand to changes in interest rate. Findings by Kandil (2014) from a cross-country study of sampled developing countries showed that real effects of monetary shock are seen to vary with price flexibility, demand elasticity and policy variation.

The argument of loose monetary policy in economic crisis to support domestic activities is supported by the Keynesian model. The Keynesians argue that a loose monetary policy can help close the negative gaps in output and restore an economy to full employment. Coulibaly (2012) noted that the consequent increase in domestic liquidity alters the effects of reduction in external credit

which commonly occurs in periods of economic crisis. The real effects of monetary shocks he added, increases as the elasticity of aggregate demand increases; but capacity constraints hamper output adjustment to the shocks. Using cross-country evidences, Kandil (2014) argued that trend output growth increases with the response of output to monetary shocks.

Study by Coulibaly (2012) to ascertain the determinants of cross-country variations in monetary policies in different eras of global financial crises by emerging market economies (EMEs), showed that macroeconomic fundamentals, openness to trade, and lower vulnerabilities, international capital flows, financial reforms and the adoption of programs at limiting inflation growth were strong determinants with significant linkages existing between some economic characteristics of different countries and their ability to conduct countercyclical monetary policy. The arguments of countercyclicality and procyclicality of monetary policies of developed and emerging economies respectively by Coulibaly (2012) and kaminsky, Reinhart and Vegh (2004), according to Aguitar and Gopinath (2007), results in high volatility of output in these economies. On variations in output, Georgiadis (2015) observed that output variations can be traced to cross-border spillovers from economic policies of other countries, which in the case of the United States is more higher than effects on outputs in the US; adding that the magnitude of the spillover depends on the trade and financial integration of the receiving country, exchange regime, de jure financial openness, financial market development, labour market rigidities, participation in global value chain and industry structure. Georgiadis (2015) suggested that countries should reduce their vulnerability to spillovers of US monetary policies to clearly direct their monetary policies to achieve desired results. This argument supports conclusions of earlier studies (Milesi-Ferretti and Tille, 2011; Cavallo and Frankel, 2008; Calvo, Izuierdo and Mejia, 2008; Edwards, 2007a,b, 2004; Rey and Martin, 2006; and Broda, 2001). Though policy objectives from variations in monetary policy instruments vary, the ultimate aim is GDP growth. How has variations in Nigeria's monetary policy from 1980 to 2015 affected the nation's GDP during this period?

Objectives of the study

This study aims to identify the policy thrusts of the Central Bank of Nigeria (CBN) monetary initiatives within the study period segmented into pre-SAP era, 1980-1986; SAP era, 1986-1993; post-SAP era, 1994-2004; post-consolidation era, 2005-2012; and post global economic crises era, 2013-2015; and determine the effects of variations in these policy instruments on Nigeria's gross domestic product (GDP) within the period.

Research hypothesis

The following hypothesis is tested in this study on the identified relationship between stated variables:

H_o: Variations in Nigeria's monetary policies does not positively affect the nation's GDP

Scope of the study

This study covers Nigeria's monetary policy instruments: cash reserve ratio, liquidity ratios, monetary policy rate (formerly called minimum rediscount rate) and loan-to-deposits ratio, and monetary policy thrusts, and GDP from 1980-2015.

Theoretical framework

The apex bank in Nigeria, the Central Bank of Nigeria, varies its monetary policies and values of the instruments: monetary policy rate (formerly called minimum rediscount ratio), cash reserve ratio, liquidity ratios, and open market operations from time to time. Upward movements in the values of these variables signals monetary policy tightening to reduce cash availability in the financial system, reduce inflationary pressures, spending with negative effects on investments and GDP. On the contrary, downward movements in these values indicates a cash easing thrust policy of the CBN to reflate the economy, increase spending, investments and GDP. The monetary policy thrust of the CBN in any year, half year or quarter is identified by the direction of movement of the values of the variables which in turn redirects financial and economic activities to achieve the economic expectations of the government. This study is hinged on this theoretical thought that variations in monetary policy instruments have varied effects on monetary policy variables set GDP targets.

Review of Literature

Nigeria's monetary policy thrust: 1980-2015

Nigeria's financial regulator, the Central Bank of Nigeria, adjusts its financial sector/economic controlling instruments: monetary policy rate, cash reserve ratio, liquidity ratio, loan-to-deposits ratio and open market operation activities to direct and redirect financial and economic activities in the country to meet desired objectives and policy targets of the Federal Government. Increase in these rates and ratios indicate stringent policy direction and thrust to reduce cash available in the economy, curtail spending to reduce inflationary pressures. Decrease in these rates and ratios signals the intention of the financial regulator to reflate the economy by increasing cash availability, investment, spending, consumption, production, employment and gross domestic product (GDP). These variations in rates and ratios in monetary policy instruments signal the thrust and economic direction of the government. These variations are expected to positively impact the economy in both the short and long runs, with increases in the country's GDP. The pre-SAP era, 1980-1986, witnessed declines in cash reserve requirements, minimum rediscount rates, liquidity ratio and loans to deposits ratio indicating government policy thrust at improving spending and reflate the economy. The SAP era, 1987-1993, witnessed increases in these rates and ratios an indication of tight monetary policy to curtail spending and reduce inflationary pressures. The post-SAP era, 1994-2004, witnessed volatility in these rates with a reduction at the end of the period; a reflection of frequency in variation of the monetary policy thrusts of the Central Bank of Nigeria. The post-consolidation era, 2005-2012, witnessed declines in these rates with the aim of reflating the economy to increase consumption, spending, production, employment and GDP. The post-global economic crises era, 2013-2015, witnessed marginal increases in these rates.

The cash reserve ratio (CRR) is a monetary policy tool employed by the Central Bank of Nigeria (CBN), to set the minimum deposits commercial banks are to hold as reserves. It is used to influence lending and interest rates by changing the amount of money at banks' disposal for granting credit facilities.

Volatility of the monetary policy thrusts of the Central Bank of Nigeria (CBN) is as a result in volatility in this ratio. Prudential discipline in monetary policy necessitates the frequent alteration of the reserve ratio. Excess liquidity in the Nigerian financial system due to bank consolidation was reduced with prudent monetary policies of tightening credit through increase in cash reserve ratios from 1% in 2004 to 2% in 2005, and sustained in 2006-2008. The monetary easing policy which was introduced by the CBN in 2009 was aimed at improving banking system liquidity, ensuring stability in the country's financial system, and constancy of credit flow to the productive sectors of the economy. This monetary management technique reflected the existing local and global economic environments with existing tight liquidity. Introduced monetary policies were aimed at easing credit in the economy. This easing of credit made necessary the need to achieve the multiple objectives of optimum liquidity in the domestic and foreign exchange markets, price and exchange rate stability and steady flow of credit to the real economy in a sound and stable financial system (CBN, 2009). In mid-2015, the cash reserve ratio (CRR) for public and private sector deposits was CBN harmonized by the CBN at 31%. The ratio initially was 20% for private sector deposits and 75% on public sector deposits. The change was initiated due to the negative effects of discriminatory CRRs which constrained monetary policy objectives and encouraged abuses by private market participants. Other reason for the change was the need to reduce tight monetary policy in the economy and to avoid economic stress, curb abuse of the discriminatory CRR, improve efficacy of the CRR as a potent monetary policy instrument and maintain current banking system stability.

During the period, MPR increased steadily from 6% in 1980 to 17% in 1992, stabilizing at 13.5% to 1998 and fluctuating between 6% and 15% through to 2015 indicating tight, stable and intermittent easy and tight monetary policies respectively. LR and LDR increased uniformly from 47.6% and 66.7% in 1980, increasing significantly to 65.1% and 81.9% in 1984 respectively, an indication of a tight money policy. The rates fluctuated between 36.4% and 83.2% in 1986, through 46.8% and 74.4% in 1998, to 39.75 % and 68.55% in 2015 indicating the CBN's alteration between easy and tight money policies. Specifically, monetary policy rate and liquidity ratio were retained at 13% and 30% respectively with a symmetric corridor of plus/minus 200 percent around their mid-points with an increase of the band around the mid-point by 200 basis points from +/- 3 percent to +/- 5 percent in November 2014 from 12% in 2012 through 2013; and increased on average to 34.88% in 2015.

Determinants of monetary policy thrusts

With country and cross-country variations monetary policies and resultant low effects on economic growth, the CBN (2016) concluded and traced the sluggish output to weak fundamentals in both emerging market developing economies (EMDEs) and advanced economies. These fundamentals it added, include sustained softness in commodity prices, increased volatility in global financial markets, sluggish global trade with much negative effects on EMDEs; concluding that variations in monetary policies did not have the desired effects as low

capital inflows, rising cost of external funds, inadequate maritime security and continuing geopolitical instability (all non-controllable by local monetary policies) steadily affects growth. The CBN (2016) noted that severe energy shortages (remotely affected by monetary policies, scarcity of foreign exchange caused by dwindling oil sales and depressed consumer demands constrained new investments and raw materials inputs. Introduced monetary policies to reduce inflationary pressures and improve growth seems not yielding the desired results as evidenced by the poor performance of credit growth to the private sector. The CBN (2016) attributed this to deposit money banks' (DMBs) continued granting of credit facilities mainly to low employment elastic sectors of the economy; an action that has significantly contributed to the poor performance of the economy. Similar effects were felt on credit and economic growth. This was attributed to increased cash reserve requirements for banks as lending was curtailed to meet the regulatory cash requirements with existing high cost of lending with the likely cash crunch. Keister and McAndrews (2009) criticized the argument of high reserves as inflationary and suggested that the size of bank reserves be determined by the size of the Federal Reserve's policy initiatives without a reflection of the requirement on bank lending. Keister and McAndrews (2009) stated that large increase in bank reserves need not be inflationary since the payment of interest on reserves allows the Federal Reserve to adjust short-term interest rates independently of the level of reserves. They noted that elimination of the positive multiplier effect of could-have-been invested credit (if not the reserves), may deprive the economy of growth.

Deregulation of the downstream petroleum sector (a non-monetary policy initiative) in addition, positively affected demand in the interbank market, exerting more pressures on the naira. To reduce this pressure, the monetary policies in the last two quarters of 2015 and first two quarters of 2016 were largely aimed at increasing the foreign exchange reserves, but actual activities in the economy has made that seem impossible. Variations in the monetary policies to improve local production seems countered by the high cost of funds which has mitigated continuation of production and new investments with attendant increase in unemployment, and reduction in disposable income, spending, consumption and growth. Research results by Barajas et al (2005) in Latin America, Konishi and Yasuda (2004) and Woo (1999) in Japan, Pazarbasioglu (1997) in Finland, Berger and Udell (1994) and Peek and Rosengren (1995) in the United States showed that monetary authority's regulations affecting banks' liquidity also affect credit availability and volatility. Naceur and Kandil (2013) noted that the extent of the effect of these regulations on credit availability and its volatility depends on the channel of transmission of the monetary policy and the strength of existing financial system. This strength they added depends on demand-driven variables' movements which are caused by the country's monetary policies. They contended that regulations reducing bank cash availability reduces bank credit and constrain real investment opportunities, and slow down real growth; which will necessitate the introduction of monetary

policies aimed at managing a country's liquidity to positively influence economic situations to stimulate credit growth, which reinforces the achieved contribution of financial intermediation to economic growth.

Using data from 188 advanced and emerging economies covering 1970-2009 to undertake a trend analysis of cross-country variations in monetary policies, Coulibaly (2012) concluded that during the 2008-2009 global financial crisis, emerging market economies (EMEs) relaxed monetary policy drastically to cushion the effect of the shock. This is in contrast with previous crises when EMEs tightened monetary policies to protect the value of their currencies to prevent capital flight to bolster policy credibility. Further studies by Coulibaly (2012) showed that financial reforms, adoption of inflation targeting and openness to trade were strong determinants of government monetary policy. Using the short-term interest rate as monetary policy tool, Kaminsky et al (2004) estimated the Taylor rule policy function for each country studied and concluded that monetary policies of advanced countries are countercyclical but procyclical in emerging economies. Findings by Coulibaly (2012) that macroeconomic policies-both fiscal and monetary-tends to be countercyclical in developed economies, but seems procyclical or acyclical in emerging economies supports the argument of Kaminsky et al (2004). Furthering, Yakhin (2008) opined that under financial integration, the optimal monetary polic is countercyclical and procyclical in autarky. Calderon, Roberto and Klaus (2003) argued that the ability of emerging economies to conduct countercyclical monetary policy is determined by the credibility of such policy. Commenting on cross-country adjustments to external shocks, Dabrowski (2012) noted that larger currency areas with stable and credible currencies and less exposure to external shocks have greater opportunities to change their monetary policies than small open economies.

Methodology

Sources, validity and reliability of data

Data for this study are secondary data obtained from the Statistical Bulletin, 2015, CBN Annual Report and Statement of Accounts, 2009, CBN Annual Report 2011, CBN Economic Report for Fourth Quarter 2015, and CBN 2014 Half Year Report . These are the official Federal Government economic data bulletins published by the National Bureau of Statistics and CBN. Thus data therein are valid and reliable.

Data analysis technique, model description and justification

This study is hinged on the assured relationship that there exist variations is Central Bank of Nigeria monetary which in both the long and short-runs affects the country's GDP. To determine the existence of variations in the data set of regressors (cash reserve ratio, monetary policy rate, liquidity ratio and loan-to-deposit ratio), we conduct the ADF with results in table 2 showing the existence of variations in monetary policies from 1980-2015.

To analyse the data obtained for this study, we use the ordinary least squares (OLS) on the log values of the data from 1980-2015. Similar studies by Milesi-Ferreti and Tille (2011); Cavallo and Frankel (2008), Calvo et al (2001) and Broda (2001) used the non-logarithmic linear estimation model, making the

linear estimation model ideal for this study. The relationship between the study variables is:

$RGDP = f(CRR, MPR, LR, LDR)$

The above relationship can be re-written in logarithmic form as:

$lnRGDP_t = \alpha_0 + \alpha_1 ln(CRR)_t + \alpha_2 ln(MPR)_t + \alpha_3 ln(LR)_t + \alpha_4 ln(LDR)_t + + \alpha_5 lnECM_{t-1} + \mu_t$

$\alpha_1, >0, \alpha_2, >0, \alpha_3, >0, \alpha_4, >0, \alpha_5, >0$

where α_0 is the constant , $\alpha_1 - \alpha_4$ are the parameters to be estimated and α_5 the error correction model. μ_t = disturbance term which is presumed to satisfy the least square assumptions of homoscedasticity, serial independence and normal distribution.

Cointegration analysis

The Vector Auto regression model is used to test the existence and the number of cointegrating vectors. Variables are cointegrated if they are affected by the same long-run influences. This is followed by the residual test. If the result of this test is integrated of the order I(0), then the variables in the model are cointegrated; requiring the use of the error correction model (ECM) which makes possible the capturing of both the short and long run dynamics of the model variables. The cointegration model is:

$$Rt = X_0 + X_1 \Delta R_{t-1} + X_2 \Delta R_{t-2} + ...X_{p-1} \Delta R_{t-p} + \Pi R_{t-p} + \mathcal{E}_i$$

The existence of r cointegrating vectors between the elements of R implies that Π is of the rank r(0<r <4) where Π can be decomposed as:

$$\Pi = \alpha \beta^1$$

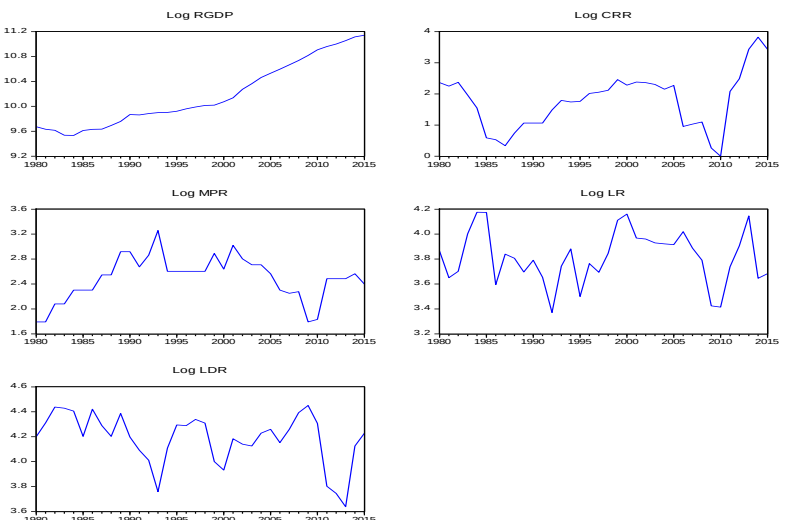
Thus the original Johansen equation can be re-written as:

$$Rt = X_0 + X_1 \Delta R_{t-1} + X_2 \Delta R_{t-2} + ...+ X_{p-1} \Delta R_{t-p} + \alpha(\beta^1 R_{t-p}) + \mathcal{E}_i$$

Variable and data description

The regresand for this study is the real gross domestic product (RGDP). The regressors for the study are the monetary policy instruments: cash reserve ratio (CRR), monetary policy rate (MPR), liquidity ratio (LR) and loan-to-deposits ratio (LDR). The logarithmic values of RGDP, CRR, MPR, LR and LDR were 9.67, 2.36, 1.7, 3.86 and 4.20 in 1980 and 11.14, 3.43, 2.40, 3.68 and 4.23 in 2015 (tables 1-5).

Fig1-5: Log values of time series data of variables



Research Results

In this study the researcher employs ARDL approach to cointegration to examine whether there is existence of level relationship between monetary policy indicators and economic growth. The test procedure follows the usual format- unit root test, test of ergodicity, LM test, Wald test, long run multiplier test and test of short run dynamism.

Unit Root Test on the Series of GDP, CRR, LR, LDR and MPR

Prior to the test of unit root, we determine the optimum lag length for the series. Table4. 1 presents the optimum lag selection results.

Table1: Optimum Lag Selection Results

Lag	Logl	LR	FPE	AIC	SC	HQ
0	-833.2439	NA	1.79e+15	49.30846	49.53293	49.38501
1	-677.2528	256.9264	8.20e+11	41.60311	42.94989*	42.06240*
2	-646.7738	41.23626*	6.58e+11*	41.28081*	43.74993	42.12285

Source: E-view Print Out

As shown in table1, the lowest value of final prediction error (FPE) and Akeike information criterion (AIC) can be traced to lag 2; while the lowest value of Schwarz and Hannan-Quine Information Criteria corresponds to lag 1. Thus, Scharz and Hannan-Quine select lag 1 while Akeike and final prediction error select lag 2. The researchers are contented to follow the decision of Hannan-Quine in this study. In view of this the results of the unit test in table 2 is conducted using the maximum lag time (1) under the assumption of constant.

Table 2: Unit Test results on the Series of GDP, CRR, LR, LDR and MPR

Series	ADF	5% Critical Value	KPSS	5% Critical Value
GDP(0)	1.244539	-2.951125	0.636946	0.463000
GDP(1)	-3.360280	-3.548490	0.088081	0.146000
CRR(0)	-3.169035	-2.951125	0.347241	0.463000
LR(0)	-3.511210	-3.544284	0.079646	0.146000
LR(1)	-5.251192	-3.552973		
LDR(0)	-3.825946	-3.548490	0.067266	0.146000
LDR(1)	-2.898052	-3.544284		
MPR(0)	-2.968307	-2.948404	0.163174	0.146000
MPR(1)	-5.950910	-3.552973		

Source: E-view Print Out

The unit test is conducted using both the ADF and KPSS. The former is based on the null hypothesis that the series is not stationary while the later hinged on the null hypothesis that the series is stationary. The KPSS test is sometime investable because it is used in corroborating the ADF test. As indicated in table 2, the ADF test shows that the series of GDP is not stationary both at raw and first difference; but the KPSS reveals that the series of GDP is not stationary at raw but stationary at first difference. The results of ADF and KPSS show that the series of cash reserve ratio is stationary at raw. The test of ADF shows that liquidity ratio, loan to deposit ratio and monetary policy ratio are stationary at first difference while KPSS indicates that the three series are stationary at raw. In summary, the two tests suggest that the series are I(0) and I(1) respectively. Therefore, there is overwhelming

evidence of mixed integration which undoubtedly informs applying bond test approach to cointegration in this study.

LM Test for the Unrestricted ARDL Residuals

One of the assumptions underlying bond test or ARDL approach to cointegration is that the residuals of the unrestricted ARDL must be free serial correlation. This assumption is confirmed in table3.

Table3: Test results of LM Serial Correlation Test

Lag	LM-Stat	P-Value
1	0.004973	0.9438
2	1.648279	0.1992
3	0.169527	0.6805
4	0.035016	0.8516
5	2.647192	0.1037

Source: E-view Print Out

Table3 shows that the LM statistics from lag 1 to 5 are very small and corresponded to large probability values. In each case, the probability value is larger than the alpha value at 5 percent implying that the null hypothesis that there is no serial correlation cannot be rejected. Hence, the assumption of no serial correlation is satisfied. The nest assumption is test of ergodicity which is reported in table 4.

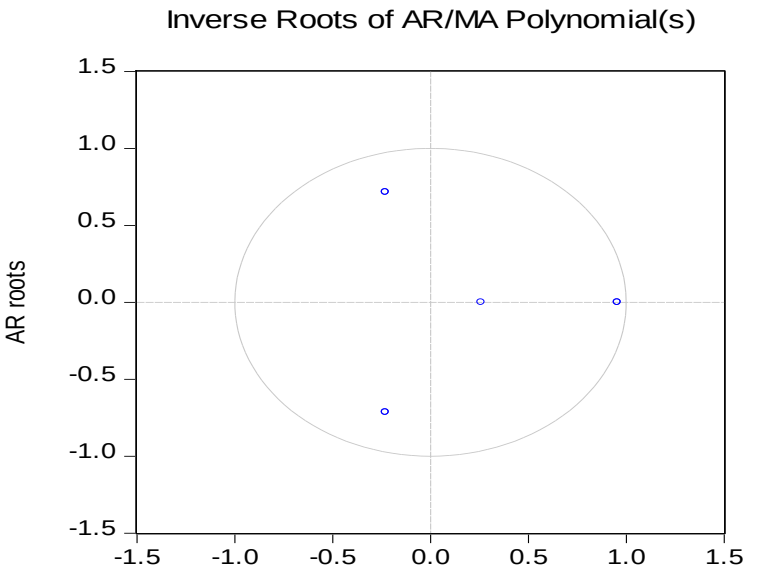
Table 4: Results of the Test of Ergodicity or Stability

AR-Root	Modulus	Cycle
0.957549	0.957549	
-0.228425 ± 0.714433i	0.750062	3.341670
0.260535	0.260535	

Source: E-view Print Out

Looking at the values of the modulus in table 4, it is very overt that they are all respectively less than one (1). This suggests that the ARDL system is stable. This result is re-enforced in figure 6.

Fig 6: Unit Cycle showing the Autoregressive Roots



The AR roots are colored blue and they all lie within the unit interval or cycle as shown in figure4.1. This further confirms the ergodicity of the ARDL model quoted in this study. Thus, all the preconditions to ARDL approach to cointegration have been met; I can now proceed to the bond test.

Bond Test

This test is analogously referred to ARDL approach to cointegration which can be conducted using Wald coefficient significant test. The test results are reported in table 5.

Table5: Wald Test result

Test Type	Value	DF	P-Value
F-statistic	3.269985	(5, 21)	0.0244
Chi-square	16.34992	5	0.0059

Source: E-view Print Out

The lower bound [I (0)] and upper bound [I (1)] values at 10% under the assumption of restricted constant and no trend are 2.08 and 3.00 respectively (see Pesaran, Shin & Smith, 2001) . The Wald test result shows that the F statistic is about 3.27 while the X^2 statistic is approximately 16.35. The F statistic 3.27 rests above the upper bound 3.00 indicating that there is level relationship. Also, the X^2 statistic 16.35 lies above the upper bound 3.00 implying the presence of level relationship. Therefore both the F and chi-square version tests attest that there is a long run relationship between monetary policy indicators andeconomic growth in Nigeria. In view of this evidence of long run relationship, we examine the long run multiplier effects among the variables. The results are shown in table 6.

Table 6: Long Run Multiplier Effects Results

Variable	Coefficient	Long Run Multiplier Effects
GDP(-1)	0.087585	
CRR(-1)	-103.562	1182.416
LDR(-1)	23.53083	-268.663
LR(-1)	71.42419	-815.484
MPR(-1)	108.0562	-1233.73

Source: E-view Print Out

The result in table 6 shows that 1 unit increase in cash reserve ratio will lead to 1182.416 units increase in growth but 1 unit increase in loan to deposit ratio, liquidity ratio and monetary policy will lead to 268.663, 815.484 and 1233.73 respectively decrease in growth in the long run. Finally, the short run dynamic results and the ECM parameter are presented in table 7.

Table7: Short Run Dynamic Results

Variables	Coefficient	Std-Error	T-Value	P-Value
C	163.9340	257.9714	0.635474	0.5311
D(GDP(-1))	1.105481	0.315112	3.508212	0.0018
D(GDP(-2))	-0.094388	0.261582	-0.360837	0.7214
D(CRR(-1))	-47.55471	35.73881	-1.330618	0.1958
D(LDR(-1))	59.88540	20.51688	2.918836	0.0075
D(LR(-1))	46.20068	19.86990	2.325159	0.0288
D(MPR(-1))	97.86589	49.81064	1.964759	0.0611
ECM(-1)	-0.728373	0.402396	-1.810090	0.0828

Source: E-view Print Out

In table 7, the ECM parameter has a coefficient of -0.73 and corresponding to p-value of 0.08. Thus, the ECM has the right sign and is significant at 10 percent. This implies that nearly 73 percent disequilibrium between economic growth, cash reserve ratio, loan to deposit ratio, liquidity ratio and monetary policy rate is corrected within one year. The short run dynamic coefficient and corresponding p-values show that monetary policy rate, liquidity ratio loan to deposit ratio maintain a significant association-ship with economic growth while cash reserve ratio display an insignificant coefficient.

Regression result

The resultant logarithmic equation from the OLS analysis is:

$RGDP = 100896.5 + 884.29ln(CRR)_t - 1521.49ln(MPR)_t - 422.95ln(LR)_t - 585.96ln(LDR)_t + \mu_t$ *(table 1)*

Table8: Regression results
Dependent Variable: RGDP
Method: Least Squares

Sample: 1980 2015
Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	100896.5	24632.34	4.096097	0.0003
CRR	884.2910	250.5944	3.528773	0.0013
MPR	-1521.490	564.8539	-2.693600	0.0113
LR	-422.9549	231.4934	-1.827071	0.0773
LDR	-585.9625	216.4205	-2.707518	0.0109

R-squared	0.617971	Mean dependent var	30311.90
Adjusted R-squared	0.555773	S.D. dependent var	17237.41
S.E. of regression	12716.33	Akaike info criterion	21.86741
Sum squared resid	5.01E+09	Schwarz criterion	22.08734
Log likelihood	-388.6133	Hannan-Quinn criter.	21.94417
F-statistic	8.327863	Durbin-Watson stat	2.328922
Prob(F-statistic)	0.000110		

The results for the intercept, CRR, MPR, and LDR are significant at 5% and the result for LR at 10%, with R^2 value at 0.56.

Research results and policy implications of findings

During the pre-SAP era, there were counter movements in monetary policies with the CRR declining steadily, and the MPR (then called the minimum rediscount rate), LR and LDR increasing. The resultant effect of these counter variations was a marginal decrease in GDP (fig 1-5). The SAP era witnessed increases in CRR and fluctuations in LR and LDR. In the post-SAP, CRR and MRR were fairly stable with fluctuations in LR and LDR. The counter movements of monetary policy instruments (an unclear non-directional monetary policy thrust) did not improve GDP. The bank consolidation era witnessed a consolidation of policy direction with CRR, MPR, LR and LDR declining sharply (an easy money policy thrust), an indication of the government's desire to reflate the economy, increase spending and GDP. The effect was evident in the sharp increase in GDP. The post-global economic crisis era similarly witnessed a consolidation of direction in the monetary policy instruments (a tight money policy) with sharp increase in values of all monetary policy variables to curtail spending and inflation which further increased GDP.

OLS result of analysed logarithmic values of variables show that there exists a positive and significant relationship between RGDP and CRR with a coefficient of 884.29 (table 1) indicating that upward review of CRR by monetary authorities increases cash held by DMBs, increasing financial system stability, depositors' confidence, customer deposits with more funds available in the financial sector for lending for production expansion and growth. Furthermore, with reduced

funds for credit advancement, the level of prudence of DMBs in Nigeria improves with credits advanced to clearly identifiable businesses with low levels of defaults; overall increasing production capacity, production and operating profits manufacturing and financial sectors, and the economy.

The negative relationship existing RGDP and MPR indicates that upward movement in MPR increases cost of borrowing in the country, apathy to borrowing by businesses leading to reduction in investments and production capacity expansion; with spiral negative effects on the country's GDP.

The negative relationship existing between RGDP and LR also indicates that upward review of the ratio increases investments in low earning short-term liquid assets. Thus upward reviews in the value of this ratio hinders DMBs from investing in high earning long-term investments (financing of production capacity expanding machineries and infrastructures) and provide credit to economic agents, reducing GDP.

From table 1, a negative relationship is seen to exist between RGDP and LDR (with a coefficient of -585.96) indicating that restricting the amount of credit advanceable by DMBs to a percentage of deposits held by them limits their credit advancing ability, with spiral negative effects on productive investments, spending, consumption and economic growth. Increasing deposits to increase credits may result in the introduction of unethical practices by DMBs with detrimental effects on financial stability and overall economic growth.

Recommendations

Findings from this study make upward review of CRR necessary to instill investment and financial discipline in the banking sector to ensure thorough scrutinization of credit requests and ensure that only viable investments are financed by DMBs. In addition, monetary authorities should consider an upward review of the value of MPR monetary policy instrument only as a last resort and in periods of hyperinflation, as its immediate and contagion effects may outweigh its benefits as indicated by the high level of the coefficient (table 1). Monetary authorities should also reduce the value of the LR ratio to increase investments in long-term assets to increase GDP; and lower the LDR rate to reduce unethical banking practices which may have negative contagion effects on Nigeria's economic growth.

References

Aguitar, M. and Gopinath, G. (2007). "Emerging market business cycles: The cycle is the trendm" *Journal of Political Economy*, 115(11): 69-102.

Barajas, A; Chami, R. and Cosimano, T. (2005). "Did the Basel Accord cause a credit slowdown in Latin America?" IMF Working Paper No. WP/05/38. Retrieved from www.imf.org on 25/7/13.

Berger, A.N. and Udell, G.F. (1994). "Did risk-based capital allocate bank credit and cause a 'credit crunch' in the United States?" *Journal of Money, Credit and Banking*. 26: 585-628.

Broad, C. (2001). "Coping with terms-of-trade shocks: pegs versus

floats". *American Economic Review*, 91(2): 376-380.

Calderon, C; Roberto, D. and Klaus, S. (2003). "The role of credibility in the cyclical properties of macroeconomic policies in emerging economies". Central Bank of Chile Working Paper No. 237.

Calvo, G; Izuierdo, A. and Mejia, L. T. (2008). "Systemic sudden stops: The relevance of balance sheet effects and financial integration". NBER Working Paper No. 14026.

Carlino, G. and DeFina, R. (1998). "The differential regional effects of monetary policy". *Review of Economics and Statistics*, 80(4): 527-587.

Cavallo, E. and Frankel, J. (2008). "Does openness to trade make countries more vulnerable to sudden stops or less? Using gravity to establish causality". *Journal of International Money and Finance*, 27(8): 1430-1452.

Cecchetti, S. (1999). "Legal structure, financial structure and the monetary policy transmission mechanism". *Economic Policy Review* (July) 9-28.

Central Bank of Nigeria (2015). *Statistical Bulletin*. Abuja: CBN

Central Bank of Nigeria (2016). "Central Bank of Nigeria communiqué No 107 of the monetary policy committee meeting". Retrieved from www.cbn.gov.ng/publications on 19/8/16.

Central Bank of Nigeria (2016). *Economic Report, First Quarter 2016*. Abuja: CBN.

Central Bank of Nigeria (2015). *Economic Report, Fourth Quarter 2015*. Abuja: CBN.

Central Bank of Nigeria (2015). *Economic Report, Third Quarter 2015*. Abuja: CBN.

Central Bank of Nigeria (2014). *Economic Report, Fourth Quarter 2014*. Abuja: CBN.

Central Bank of Nigeria (2014). *Economic Report, For First Half Year 2014*. Abuja: CBN.

Central Bank of Nigeria (2012). *Economic Report, Third Quarter 2012*. Abuja: CBN.

Central Bank of Nigeria (2011). *Economic Report, Fourth Quarter 2011*. Abuja: CBN.

Central Bank of Nigeria (2009). *Economic Report, Third Quarter 2009*. Abuja: CBN.

Central Bank of Nigeria, CBN (2009). *Annual Report*. CBN. Abuja.

Chapman, J.T.E. (2008). "Policy coordination in an international payment system". Bank of Canada Working Paper No. 2008-17, 1-29.

Coulibaly, B. (2012). "Monetary policy in emerging economies: what lessons from global financial crisis?" Retrieved from www.federalreserve.gov/pub/ifdp on 23/8/16.

Dabrowski, M. (2012). "Fiscal and monetary policy determinants of Eurozone crisis and its resolution". Paper presented at the 9th Euroframe Conference on Economic Policy Issues in the European Union at Kiel on June 8, 2012. Retrieved from www.case-research.eu/no443 on 23/8/16.

Edwards, S. (2007a). "Capital controls, capital flow contractions and macroeconomic vulnerability". *Journal of International Money and Finance*, 26(5): 814-840.

Edwards, S. (2007b). "Capital controls, sudden stops, and current account

reversals" in Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences. *NBER Chapters*. National Bureau of Economic Research: 73-120.

Edwards, S. (2004). "Financial openness, sudden stops, and current-account reversals" *American Economic Review*, 94(2):59-64.

Erhmann, M. (2000). "Comparing monetary policy transmission across European Countries". *Review of World Economics*, 136(1): 58-83.

Georgiadis, G. (2015). "Determinants of global spillovers from US monetary policy". Working Paper Series No. 1854/September 2015. Retrieved from www.ecb on 23/8/16.

Georgiadis, G. (2014). "Towards an explanation of cross-country asymmetries in monetary transmission". *Journal of Macroeconomics*, 39(…): 66-84.

Jones, B. (2008). "Monetary policy and monetary asset substitution". *Economic Letters*, 99(1): 18-22.

Kamar, B. and Naceur, S. B. (2007). "GCC monetary union and the degree of macroeconomic policy coordination". IMF Working Paper, WP/07/249. Retrieved from www.imf.org/publications on 19/8/16.

Kaminsky, G; Reinhart, G. and Vegh, C. (2004). "When it rains, it pours: procyclical capital flows and macroeconomic policies". NBER Working Paper No. 10780.

Kandil, M. (2014). "On the effects of monetary policy shocks on developing countries". *Borsa Istanbul Review*, 14(2014): 104-118.

Keister, T. and McAndrews, J. (2009). "Why are banks holding so many excess reserves?" Retrieved from www.newyorkfed.org on 25/6/13.

Kilponen, J. and Leitemo, K. (2008). "Model uncertainty and delegation: A case for Friedman's K-percent money growth rule". *Journal of Money, Credit and Banking*, 40(2-3): 547-556.

Konishi, M. and Yasuda, Y. (2004). "Factors affecting risk rating: evidence from Japan". *Journal of Banking and Finance*. 28: 215-232

Kumar, F. (2007). "A markov-switching approach to measuring exchange rate pressure". IMF Working Paper, WP/07/242. Retrieved from www.imf.org/publication on 19/8/16.

Milesi-Ferretti, G. and Tille, M. (2011). "The great retrenchment: International capital flows during the great financial crisis". *Economic Policy*, 26(66): 1003-1035.

Naceur, S.B. and Kandil, M. (2013). "Basel capital requirements and credit crunch in the MENA region". WP/13/160. Retrieved from www.imf.org/publications on 25/9/13.

Pazarbasioglu, C. (1997). "A credit crunch? A case study of Finland in the aftermath of the banking crises". IMF Working Paper No. WP/96/135. Retrieved from www.imf.org on 25/7/13.

Peek, J. and Rosengren, E. (1995)."Bank regulation and credit crunch". *Journal of Banking and Finance*. 19: 679-692.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the

analysis of level relationships. *Journal of Applied Econometrics*, 16: 289–326

Rey, H. and Martin, P. (2006). "Globalization and emerging markets: with or without crash?" *American Economic Review*, 9(5):1631-1651.

Sahuc, J.G. and Smets, F. (2008). "Differences in interest rate policy at the ECB and the fed: An investigation with a medium-scale DGSE model". *Journal of Money, Credit and Banking*, 40(2-3): 505-521.

Sala, L. (2008). "Monetary policy under uncertainty in an estimated model with labour market frictions". Centre for economic Policy Research. Discussion Paper Series No. 6826.

Yakhin, Y. (2008). "Financial integration and cyclicality of monetary policy in small open economies". Monaster Centre for Economic Research Discussion paper No. 08-11.

Woo, D. (1999). "In search of a 'capital crunch': factors behind the credit slowdown in Japan". IMF Working Paper No. WP/99/3. Retrieved from www.imf.org 25/7/13.