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Monetary Policy and Macroeconomic Stability in Nigeria: Evidence from Error Corection Model

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Abstract
Monetary and fiscal policies seek to achieve relative macroeconomic stability. Based on experiences on the role of monetary policy in controlling economics instability, this study examines the extent to which the above objective has been achieved in the Nigerian economy. Employing the error correction methodology and using data spanning over 1970 to 2010 and found that monetary policy has played positive and significant role in stabilizing the Nigerian economy by raising aggregate output. This finding was however contrasted as exchange rate policy has not been effective since it has impacted significantly negative on the economy. Moreover, money supply, exchange rate and minimum rediscount variables had positive and significant effects on consumer price index, implying that they have together fueled inflation in the economy. It is therefore suggested that government through the relevant agencies should fine tune the monetary policy as it affects supply of money to the economy, credit to banks and exchange rate regime (while keeping its eye on other complementary policies) so that they can have better stabilizing effects on the Nigerian economy.
Keywords: Monetary policy, Inflation, Output, Investment and Employment

1.0 Introduction

The Central bank is traditionally saddled with monetary policy management for an economy. Given that monetary policy is just one of many other government policies designed to help it actualize its responsibilities to the people, the manner in which monetary policy is administered in line with other macroeconomic policies has implication for the real sector of the economy. Though the mechanism for the transmission of monetary policy can be complex, the prevailing macroeconomic factors, financial system and regulatory framework must all interplay if it is to yield desired result.

The challenges of inflation and or the goal of stabilizing prices (aside from the issue of unemployment and wealth creation) is one which monetary policy has got to directly contend with using the instrumentality of interest rate channel. The management of interest rate must therefore be tactical as the magnitude of its change and when it is applied matters for monetary policy effectiveness.

In the past, specifically in the late 1980 to early 1990, interest rate was directly controlled by the central bank with the aim that it can be used to accelerate investment by allotting credit to priority sectors (Nnanna, 2002). This practice turned to be a disincentive for investment rather than what it was meant for, given high and volatile rate of inflation in the country then.

The policy framework which followed favoured deregulation though not a full scale one. In spite of this, the interest rate in the economy was high and unstable. It was as high as 26% and was perceived to be inimical to the economy as the cost of borrowing became exorbitant. This lead the central bank to fix monetary policy and Treasury bill rates at 13.5% and 12.5% respectively over the period 1980's and early 1990's. Consequently, other saving rates in the economy declined.

Thereafter, since the late 1990, interest rate determination in the country has been left to the forces of demand and supply and this seem to have paid off for the economy.

General opinion by experts including the World Bank is that efficient monetary policy has implication for financial sector and economic development as well as mobilization of resources for investment. The country stands to gain by way of employment and productivity growth that come with it. Schumpeter asserted that monetary policy activities have positive impact on economic growth as a result of its effects on productivity

growth and technological change. Where monetary policy is not efficient and effective, financial shallowness as indicated by high interest rate spread will be evident. In this regard, studies on the relationship between financial system intermediation and economic growth abound. In clear terms this study seeks to know whether variations in interest and exchange rates over the years have had any effect on the real variables in the Nigerian economy as expected. In addition, it seeks to link the short run and long run relationship between the monetary policy variables and economic growth in the Nigerian economy. Consequently, we are interested in finding out whether monetary policy has been able to keep inflation under check, promote growth and stabilized the economy given that inflation and unemployment rates have reached unacceptable heights in recent times though the economy has strangely been recording growth which has been termed "jobless".

2.0 Review of Literature

A number of case studies on Asia and African countries show the positive nexus between development of financial intermediation and economic growth. For instance, Obamuyi (2009) noted that the real sector of an economy benefits if financial intermediation is efficient since savers are guaranteed higher return while borrowers can access fund for investment at lower cost.

Valverde et al (2004) also stressed that where financial intermediation is ineffective due to monetary policy slack, only a little percentage of fund mobilized through savings eventually gets to be invested productively because intermediation cost is high.

Richard et al (2000) estimated a forward-looking monetary policy reaction function for the postwar United States economy, before and after Volcker's appointment as Fed Chairman in 1979. The results point to substantial differences in the estimated rule across periods. In particular, interest rate policy in the Volcker-Greenspan period appears to have been much more sensitive to changes in expected inflation than in the pre-Volcker period. They then compare some of the implications of the estimated rules for the equilibrium properties of inflation and output, using a simple macroeconomic model, and show that the Volcker-Greenspan rule is stabilizing.

Mcknight (2011) in a study on investment and interest rate policy in an open economy found that in the presence of investment activity monetary policy that targets domestic price inflation is more susceptible to self-fulfilling fluctuations than monetary policy rules that target consumer price inflation.

Chen (2008) examines the impact of macroeconomic policy shocks in a flexible-price dynamic stochastic general equilibrium (DSGE) model with money. He modeled monetary policy as a central bank using a simple interest rate rule (Taylor rule). Without assuming price stickiness or frictions in financial markets, the model was found to account for liquidity effects, generate higher persistence in output and inflation, and capture the positive unconditional cross-correlations relating inflation and output.

Bernanke and Gertler (1987a) develop a model of banking and macroeconomic behaviour which stresses the role of banks in facilitating credit flows. The analysis first demonstrates how the financial health of the banking sector itself may be important to the macro economy and secondly discusses how monetary policy can matter to real activity by affecting the flow of bank credit. The underlining argument is that banks net worth is positively correlated to deposit and consequently to the proportion of their portfolio given as credit. This then has implication for investment and output within an economy. It follows that monetary policy can matter by affecting the availability of bank credit, in contrast to the traditional Keynesian and Monetarist stand. This transmission mechanism arises to the extent that, first, the level of bank reserves constrains bank lending and that, second the central bank can control the real quantity of reserves for instance as a result of short run price rigidity (Blinder and Stiglitz 1983, Farmer 1986)

Farmer (1985,) found that interest rate movements have significant effects on employment demand and layoff probabilities, to the extent that firms need leverage to finance factor demands.

Williamson (1987), incorporated a model of intermediation and credit rationing into a simple business cycle framework to study the interaction between financial and real variables. He found that productivity disturbances - in the form of mean preserving spreads to project returns — change default probabilities, thereby affecting the degree of credit rationing and the levels of investment and output.

Udegbunam and Eriki (2001), in their study on the Nigerian Stock Market, examining the relation between stock prices and inflation found a strong evidence to support the proposition that inflation exerts a significant negative influence on the behaviour of stock prices. The study further revealed that stock prices are also strongly driven by the level of economic activity measured by Gross Domestic Product (GDP), interest rate, money stock and financial deregulation.

Mbutor (2007), studied the lending channel of Monetary Policy Transmission in Nigeria and found that an increase in the minimum rediscount rate by 0.25 percentage points will leave the quantity of loans made by the banks unaffected in the first period. The lagged fall in the quantity of loans is consistent with expectations that loan contracts take some time to be adjusted. This evidence confirms that an increase in the minimum rediscount rate (MRR) causes banks to reduce the quantity of loans which they extend to their customers, therefore the

hypothesis that the lending channel of monetary policy transmission mechanism exist in Nigeria is therefore accepted.

Exchange rate is another important source of monetary policy transmission mechanism identified in Nigeria by Uchendu (1996). In the wake of financial liberalization worldwide and increasing trade and capital movements, exchange rates have been identified as one of the major determinants of business profitability and equity prices (Kim 2003).

In a framework where the government sets a distortionary tax rate, it was shown that uncertainty about the "political" preference parameter of the central bank, i.e. the relative weight assigned to inflation and output gap targets, could reduce average inflation as well as inflation and output variability (Hughes Hallett and Viegi (2003), Ciccarone *et al*. (2007), Hefeker and Zimmer (2010)).

Folawewo, and Osinubi (2006), noted that the effort of monetary policy at influencing the finance of government fiscal deficit through the determination of the inflation-tax rate affects both the rate of inflation and the real exchange rate, thereby causing volatility in their rates.

Ismihan and Ozkan (2004) examine the link between central bank independence and productivity-enhancing public investment. They argue that while central bank independence delivers lower inflation in the short term, it has the potential to reduce the scope for productivity-enhancing public investment and so constrains future growth potential.

The foregoing reveals the role of monetary policy in driving the economy to achieve desired macroeconomic goals. The concern therefore among stake holders is directed at finding whether inefficient interest and exchange rates in the economy are borne on the wings of agents profit maximizing behavour, macroeconomic environment, regulatory or institutional framework in the financial system in Nigeria.

3.0 Model Specification and Framework

In the specification of the model a log linear relationship is assumed within an ordinary least square framework and we particularly employed the error correction methodology because of the resulting challenges from unit root test (in spite of its strength) as it relates to loss of valuable information with respect to the long run peculiarities of a variable. The empirical analysis employed annual data spanning over 1980 and 2010 obtained from the Central Bank of Nigeria (CBN) statistical bulletin 2011 edition. E-views version 3.0 was used to process the results. First, an investigation of the time series properties of the variables is carried out. Using the Augmented Dickey-Fuller (ADF) test, Table 1 shows the unit root test results which indicates that all of the variables in the empirical model are integrated at levels I(0).

The variables employed are consumer price index (Cpi) as a measure of inflation, minimum rediscount rate (Mrr) to capture monetary policy, exchange rate (*Exr*), real gross domestic product (*Rgdp*) and money supply (Ms).

Theory suggests that monetary policy affects real variables through the flow of bank credit which is determined by minimum rediscount rate. Thus, lower rediscount rate will raise banks liquidity, lower interest rate and increase demand for credit and hence growth of real variables. The reverse is also true. The exchange rate is also a part of monetary policy. It is expected to impact on the real variables positively or negatively depending on the nature or components of imports as well as the volume and quality of exports.

Thus, we specify a number of equations to reflect these theoretical framework in an attempt to view the performance of monetary policy with respect to macroeconomic stability over the period considered.

$Rgdp_t = b_0 + b_1 Mrr_t + b_2 \text{Exr} + b_3 \text{Ms} + U_t$ …….. (1)

$Cpi_t = a_0 + a_1 Exr_t + a_2 Ms + a_3 Mrr_t + U_t$ …….. (2)

We expect that: $b_2, a_1, a_2, a_3 \square 0$ & $b_1, b_3, \square 0$

Transforming the above structural econometric models to stationary models we have:

$\Delta LnRgdp_t = b_0 + b_1 \Delta LnMrr_t + b_2 \Delta Ln\text{Exr}_t + b_3 \Delta Ln\text{Ms}_t + U_t$ …….. (3)

$\Delta Ln\ Cpi_t = a_0 + a_1 \Delta LnExr_t + a_2 \Delta LnMt_s + a_3 \Delta LnMrr_t + U_t$ .....…….. (4)

Where: Δ is differencing operator, Ln is natural log to base 10, U_t is the random term, the b_i and a_i are the intercept and slope parameters while i = 0, 1, 2, 3 in each case.

We employed the Augmented Dickey – Fuller (ADF) (1981) procedure to test for unit root in the variable. The outcome of that test is presented in table (2) below.

The next thing to do, having tested for unit root, is to find out if the variable in our model are co integrated. This can be known from equations (3) and (4) by examining the residuals thereof if they are stationary at level, that is I(0), Mackinnon (1993). Co integration suggests that a long run, equilibrium relationship do exist between the variables.

Given that our variable in the structural model are co integrated, we can proceed to estimate the error correction representation. The error correction model (ECM) reconciles the long run behavior of a time series with its short run behavior. Thus we can use the error series in equations (3) and (4) to link the behaviour of the left hand side variables to the right hand side ones and correct for any disequilibrium in the short run between them.

Thus, the ECM for equations (3) and (4) can be stated as:

$\Delta LnRgdp_t = \lambda_1 + \lambda_2 (LnRgdp_{t-1} - b_0 - b_1 LnMrr_{t-1} - b_2 Ln\text{Exr}_{t-1} - b_3 Ln\text{Ms}_{t-1}) + V_t$ …….. (5)

$\Delta Ln\ Cpi_t = \alpha_1 + \alpha_2 (LnCpi_{t\ t-1} - a_0 - a_1 LnExr_{t-1} - a_2 LnMs_{t-1} - a_3 LnMrr_{t-1}) + V_t$ …….. (6)

Equations (5) and (6) simply suggest that changes in the dependent variables depend on disequilibrium in the co integrating relationship in the preceding period. The coefficients λ_2 and α_2 determine the speed of adjustment to the long run equilibrium and they are expected to be negative.

However, the ECM can also be estimated by using the lagged residuals from a co integrating relationship as the dependent variable on the terms in brackets in equations (5) and (6).

Thus,

$ECM = \text{LnRgdp}_{t-1} - b_0 - b_1 LnMrr_{t-1} - b_2 Ln\text{Exr}_{t-1} - b_3 Ln\text{Ms}_{t-1}$ …… (7)

$ECM = LnCpi_{t-1} - a_0 - a_1 LnExr_{t-1} - a_2 LnMs_{t-1} - a_3 LnMrr_{t-1}$ …… (8)

The specified error correction model becomes;

$\text{LnRgdp}_{t-1} = b_0 + b_1 \text{LnRgdp}_{t-2} + b_2 LnMrr_{t-1} + b_3 Ln\text{Exr}_{t-1} + b_4 Ln\text{Ms}_{t-1} + b_5 \text{ECM}_{t-1}$ ……. (9)

$LnCpi_{t-1} = a_0 + a_1 LnCpi_{t-2} + a_2 LnExr_{t-1} + a_3 LnMs_{t-1} + a_4 LnMrr_{t-1} + a_5 \text{ECMt}_{-1}$ ……..… (10)

Note that ECMs in (9) and (10) are the one period lags of residuals from co integrating equations (3) and (4) respectively.

4.0 Empirical Result

It is important that the variables in our model provide sufficient information on their separate effects on the models, though economic theory may indicate their importance in the relationship specified. Hence we test for multicollinearity between the variables. We employed the pairwise correlations method and a commonly used rule of thumb is that a correlation coefficient between two explanatory variables greater than 0.8 or 0.9 in absolute value indicates a strong linear association and indicates harmful collinearity.

Table 4.1: Correlation Matrix

	RGDP	CPI	MRR	EXR	MS
RGDP	1.000000	0.932636	0.419080	0.887519	0.832750
CPI	0.932636	1.000000	0.171635	0.935686	0.913491
MRR	0.419080	0.171635	1.000000	0.343535	-0.036129
EXR	0.887519	0.935686	0.343535	1.000000	0.731022
MS	0.832750	0.913491	-0.036129	0.731022	1.000000

The outcome of the multicolinearity test as given by the correlation matrix above suggests that the coast is clear except for money supply and exchange rate. However, we can ignore this counting on theoretical relationship existing between money supply and exchange rate. That is, given that higher money supply will fuel inflation making domestic goods relatively expensive compared to foreign goods such that foreign goods are in high demand forcing exchange rate to rise. Moreover, we estimated the relationship at first difference as given by equations (3) and (4) hence plummeting the effect of colinearity.

Table 4.2: ADF UNIT ROOT TEST

Variables	ADF Statistics	Order of integration	Mckinnon Critical value
Rgdp	-5.755	I(1)	-4.2117 @ 1%
Mrr	-8.4471	I(1)	-4.2109 @ 1%
Exr	-6.5076	I(1)	--4.2192 @ 1%
Cpi	-4.3346	I(1)	-4.2309 @ 1%
Ms	-3.7662	I(1)	-3.5279 @ 5%

The unit root test showed that all variables in our model are integrated of order one, that is, they are I(1). We then proceed to estimate equation (1) and (2) which are to show the long run relationship between the right hand side variables and the left hand side ones.

Table 4.3: Results of OLS Static Regression of Equation (1)

Dependent Variable is LnRgdp

Variable	Coefficient	Standard error	t-statistic	Probability
C	1.3740	0.7743	1.7744	0.0844
LnMrr	1.3549	0.1680	8.0628	0.0000

LnEXR	-0.5604	0.0903	-6.2068	0.0000
LnMs	0.7522	0.0714	10.5284	0.0000

$R^2 = 0.9268$ Adj.$R^2 = 0.9207$ F = 152.12 DW = 1.3561

Table 4.4: Results of OLS Static Regression of Equation (2)
Dependent variable is LnCpi

Variable	Coefficient	Standard error	t-statistic	Probability
C	-5.0063	0.3185	-15.7159	0.0000
LnMrr	0.4149	0.0371	11.1701	0.0000
LnEXR	0.5014	0.0294	17.1701	0.0000
LnMs	0.1742	0.0691	2.5204	0.0163

$R^2 = 0.9995$ Adj.$R^2 = 0.9950$ F = 2628.09 DW = 0.8761

We proceeded to conduct unit root test on the residual series from the static regressions in tables (3) and (4) above and found that they were both stationary at level with ADF statistic of -4.4237 and -3.2087 greater than 1% critical values of -4.2091 and -2.6227 respectively. This confirmed that co-integrating relationships do exist between Real gross domestic product and the monetary policy variables as well as consumer price index and the monetary policy variables, and hence long run equilibrium relationships.

Based on the established co-integrating relationships, the estimate of the ECM was obtained. This relates the short run changes in the left hand side variables to deviations from the long run equilibrium in the past period.

Table 4.5: The Error correction estimate based on equation (9)
Dependent variable LnRgdp(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	0.9551	0.5900	1.6188	0.1150
LnRgdp(-2)	0.6139	0.1172	5.2359	0.0000
LnMrr(-1)	0.4004	0.2169	1.8459	0.0739
LnExr(-1)	-0.2073	0.0911	-2.2754	0.0295
LnMs(-1)	0.2827	0.1016	2.7824	0.0089
ECM(-1)	0.2772	0.1263	2.1953	0.0353

R2 = 0.9628 Adj. R2 = 0.9572 F = 171.12 DW = 2.6231 AIC = 0.5262 SC = 0.7821

Table 4.6: The Error correction estimate based on equation (10)
Dependent variable LnCpi(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	-2.4731	0.4889	-5.0577	0.0000
LnCpi(-2)	0.5026	0.0892	5.6358	0.0000
LnExr(-1)	0.2017	0.0439	4.5870	0.0001
LnMs(-1)	0.2097	0.0498	5.0126	0.0295
LnMrr(-1)	0.1213	0.0436	2.7818	0.0089
ECM(-1)	0.3991	0.1056	3.7789	0.0006

R2 = 0.9984 Adj. R2 = 0.9981 F = 4107.62 DW = 2.5105 AIC = -1.6319 SC = -1.3759

Table 4.7: Parsimonious Error correction estimate based on equation (9)
Dependent variable LnRgdp(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	1.425191	0.618843	2.302994	0.0275
LNRGDP(-2)	0.889884	0.068529	12.98543	0.0000

LNMRR(-1)	-0.024980	0.168443	-0.148299	0.8830
LNEXR(-1)	0.026583	0.038450	0.691357	0.4940
ECM(-1)	0.275606	0.138225	1.993896	0.0542

R2 = 0.9541 Adj. R2 = 0.9487 F = 176.88 DW = 2.376 AIC = 0.6856 SC = 0.8989

Table 4.8: Parsimonious Error correction estimate based on equation (9)
Dependent variable LnRgdp(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	1.647713	0.535620	3.076273	0.0041
LNRGDP(-2)	0.794203	0.091640	8.666592	0.0000
LNMRR(-1)	0.046632	0.160285	0.290930	0.7729
LNMS(-1)	0.069399	0.041522	1.671397	0.1038
ECM(-1)	0.298041	0.133454	2.233292	0.0322

R2 = 0.9570 Adj. R2 = 0.9519 F = 189.34 DW = 2.396 AIC = 0.6206 SC = 0.8339

Table 4.9: Parsimonious Error correction estimate based on equation (9)
Dependent variable LnRgdp(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	1.133730	0.449642	2.521408	0.0164
LNRGDP(-2)	0.914010	0.058538	15.61397	0.0000
LNMRR(-1)	0.003303	0.162177	0.020366	0.9839
ECM(-1)	0.256593	0.134447	1.908500	0.0646

R2 = 0.9535 Adj. R2 = 0.9495 F = 239.25 DW = 2.379 AIC = 0.6482 SC = 0.8189

Table 4.10: Parsimonious Error correction estimate based on equation (10)
Dependent variable LnCpi(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	-6.556571	0.485628	-13.50123	0.0000
LNRGDP(-2)	-0.328268	0.082723	-3.968271	0.0004
LNMRR(-1)	0.793640	0.146609	5.413320	0.0000
LNMS(-1)	0.927320	0.037492	24.73383	0.0000
ECM(-1)	0.601769	0.290025	2.074882	0.0456

R2 = 0.9865 Adj. R2 = 0.9849 F = 624.43 DW = 1.059 AIC = 0.4416 SC = 0.6549

Table 4.11: Parsimonious Error correction estimate based on equation (10)
Dependent variable LnCpi(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	-4.327453	0.500125	-8.652736	0.0000
LNRGDP(-2)	0.518900	0.055579	9.336308	0.0000
LNMRR(-1)	-0.665236	0.138269	-4.811170	0.0000
LNEXR(-1)	0.830868	0.030946	26.84923	0.0000
RESID02(-1)	0.455449	0.267752	1.701011	0.0981

R2 = 0.9885 Adj. R2 = 0.9871 F = 731.38 DW = 1.262 AIC = 0.2855 SC = 0.4988

Table 4.12: Parsimonious Error correction estimate based on equation (10)
Dependent variable LnCpi(-1)

Variable	Coefficient	Standard error	t-statistic	Probability
C	-13.34819	1.720492	-7.758355	0.0000
LNRGDP(-2)	1.259747	0.224059	5.622391	0.0000
LNMRR(-1)	0.245682	0.622510	0.394663	0.6955
RESID02(-1)	-0.109632	1.239630	-0.088439	0.9300

R2 = 0.7449 Adj. R2 = 0.7231 F = 34.07 DW = 0.160 AIC = 3.3345 SC = 3.5051

The foregoing series diagnoses showed that the ECMs fit the linear combination of our chosen macroeconomic indicators and the monetary policy variables. This can be observed not only from the high adjusted coefficients of determination, acceptable first order autocorrelation statistic, significant parameters, but also for least values of Akaike and Schwarz information criteria compared to the parsimonious ECM specifications. The equilibrium error terms (ECMs) are statistically significant though they picked up positive signs. This implies that to restore equilibrium at any point in time (when the model is out of equilibrium) changes in the monetary policy variables and the error terms ***must be*** negative.

The result showed that both on the short and long run, monetary policy as represented by minimum rediscount rate and money supply had positive and significant effect on the economy's output, while exchange rate had negative and significant effect on output in the economy.

The analysis also revealed that money supply, exchange and minimum rediscount rates had positive and significant effects on consumer price index (our proxy for inflation). More so, lagged value of consumer price index had positive and significant effect on its current value suggesting rational expectation and panic purchase among consumers. This phenomenon possibly explains why the lagged value of real gross domestic product also had positive and significant effect on its current value.

The parsimonious ECM revealed that monetary policy and exchange rate regime work together. When we dropped money supply, minimum rediscount rate and exchange rate became insignificant maintaining their signs. We then dropped exchange rate and reintroduced money supply and found that minimum rediscount rate and money supply are also insignificant. We then went further to drop both money supply and exchange rate, minimum rediscount rate became insignificant.

However, as touching inflation, the situation was different as the dropping of exchange rate improved the significance if money supply with no effect on minimum rediscount rate. We then dropped money supply and reintroduce exchange rate. This caused minimum rediscount rate to impact negatively and significantly on inflation and exchange rate becoming even more significant.

5.0 Conclusion

This study set out to find out whether monetary policy has been able to keep inflation under check, promote growth and stabilized the economy. It was found that monetary policy has played positive and significant role in stabilizing the Nigerian economy by raising aggregate output. The result also showed that physical policy (i.e strategic product reserve and release at the appropriate time) can help to checkmate inflation in the country. Exchange rate policy has not been effective since it has impacted significantly negative on the economy. Moreover, money supply, exchange rate and minimum rediscount variables had positive and significant effects on consumer price index, implying that they have together fueled inflation in the economy. Particularly, the finding was mixed as touching the effectiveness of minimum rediscount rate in checking inflation. When combined with money supply, it fueled inflation but when applied with exchange rate, it dampened inflation significantly. It is therefore recommended that a mixture of exchange rate policy with the instrumentality of minimum rediscount rate be looked into. It is also recommended that monetary policy and exchange rate regime be harmonized as the study found that they work together as discussed above. Government should also fine-tune her strategic grain reserve policy as this will not only help keep the farmers in production but also serve as a check on the tendencies for prices of stable food items to be on the increase. It is further suggested that government, through the relevant agencies should fine tune the monetary policy as it affects supply of money to the economy, credit to banks and exchange rate regime (while keeping its eye on other complementary policies) so that they can have better stabilizing effects on the Nigerian economy.

REFERENCES

Bernanke, Ben S. and Gertler, Mark (1987a), "Agency Costs, Collateral, and Business Fluctuations" *NBER working paper* no. 2015,

Blinder, Alan and Joseph E. Stiglitz, (1983), "Money Credit Constraints, and Economic Activity" *American Economic Review* 73 297-302.

Ciccarone, Giuseppe, Enrico Marchetti and Giovanni Di Bartolomeo (2007), "Unions, fiscal policy and central

bank transparency," *The Manchester School*, vol. 75, 617-33.
Farmer, Roger (1986), "A New Theory of Aggregate Supply." *American Economic Review* 920- 30
Farmer Roger (1985), "Implicit Contracts with Asymmetric Information and Bankruptcy: The Effect of Interest Rates on Layoffs." *Review of Economic Studies* 52 427—442
Folawewo, A. O and T. S. Osinubi (2006), "Monetary Policy and Macroeconomic Instability in Nigeria:A Rational Expectation Approach." *Journal of Social Science*, 12(2): 93-100
Hefeker, Carsten and Blandine Zimmer (2010), "Uncertainty and fiscal policy in an asymmetric monetary union," *Open Economies Review*, forthcoming.
Hughes-Hallett, A. and Viegi, N. (2003), "Imperfect transparency and the strategic use of information in monetary policy: An ever present temptation for central bankers", *The Manchester School*, 71, 498-520.
Ismihan, Mustafa and F. Gulcin Ozkan (2004), "Does central bank independence lower inflation?" *Economics Letters* 84, 305-09
Kim, K (2003) "Dollar Exchange Rate and Stock Price: Evidence from Multivariate Cointegration and Error Correction Model." *Review of Financial Economics* 12, 301-313.
Mbutor, O. Mbutor (2007), "The Lending Channel of Monetary Policy Transmission in Nigeria; Vector Autoregressive (VAR) Verification," Central Bank of Nigeria; *Economic and Financial Review* Vol.45/1 March
Mckinnon, R. I. (1993), "Money and Capital in Economic Development" *The Brookings Institute,* Washington D. C
Nnanna, J. O (2002), "Monetary Policy and Exchange rate Stability in Nigeria." *The Nigerian Banker,* Jul. – Dec., Pp 43 – 53
Obamuyi, T. M. (2009), "*An* Investigation of the Relationship between interest rate and economic growth in Nigeria, 1970 – 2006," *Journal of Economic and international Finance* vol. 1(4), September: Pp. 093 – 098
RichardClarida, Jordi Gali and Mark Gertler (2000), "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory" *The Quarterly Journal of Economics* 115 (1): 147-180.
Shiu-Sheng Chen (2008), "The liquidity effect in a flexible-price monetary model" *Oxf. Econ. Pap*. 60 (1): 122-142.
Stephen McKnight (2011), "Investment and interest rate policy in the open economy" *Oxf. Econ. Pap*. 63 (4): 673-699.
Udegbunam, Ralph and P. O. Eriki (2001), "Inflation and Stock Price Behavior: Evidence from Nigerian Stock Market," *Journal of Financial Management & Analysis,* XX (14) (1), 1-10.
Uchendu,A.O (1996), "The Transmission of Monetary Policy in Nigeria." Central Bank of Nigeria: *Economic and Financial Review, 34(2), 606 – 625.*
Williamson, Stephen D (1987), "Costly Monitoring, Financial Intermediation, and Equilibrium Credit Rationing", *Journal of Monetary Economics* 18, 159—79

Appendix: The data used in the study

year	Rgdp	Cpi	Mrr	Exr	Ms
1970	4219	0.226174	4.5	0.71429	978.2
1971	4715.5	0.232249	4.5	0.6955	1041.8
1972	4892.8	0.239156	4.5	0.6579	1214.9
1973	5310	0.283516	4.5	0.6579	1522.5
1974	15919.7	0.310517	4.5	0.6299	2352.3
1975	27172	0.445525	4	0.6159	4241.2
1976	29146.5	0.499527	3.5	0.6265	5905.1
1977	31520.3	0.65575	4	0.6466	7898.8
1978	29212.4	0.696253	5	0.606	7985.4
1979	29948	0.754113	5	0.5957	10224.6
1980	31546.8	0.8756196	6	0.5464	15100
1981	205222.1	1.0279851	6	0.61	16161.7
1982	199685.3	1.0993462	8	0.6729	18093.6
1983	185598.1	1.5255839	8	0.7241	20879.1
1984	183563	1.87	10	0.7649	23370
1985	201036.3	1.890104	10	0.8938	26277.6
1986	205971.4	2.1485467	10	2.0206	27389.8
1987	204806.5	2.3568439	12.75	4.0179	33667.4
1988	219875.6	3.7994947	12.75	4.5367	45446.9
1989	236729.6	5.4967309	18.5	7.3916	47055
1990	267550	5.6953847	18.5	8.0378	68662.5
1991	265379.1	7.003028	14.5	9.9095	87499.8
1992	271365.5	10.420645	17.5	17.2984	129085.475
1993	274833.3	16.804567	26	22.0511	198479.203
1994	275450.6	29.703562	13.5	21.8861	266944.886
1995	281407.4	45.028023	13.5	81.0228	318763.466
1996	293745.4	51.47346	13.5	81.2528	370333.525
1997	302022.5	56.730616	13.5	81.6494	429731.331
1998	310890.1	63.488891	14.3	83.8072	525637.8
1999	312183.5	63.630856	18	92.3428	699733.705
2000	329178.7	72.874492	13.5	100.8016	1036079.55
2001	356994.3	84.895031	14.31	111.701	1315869.15
2002	433203.5	95.2	19	126.2577	1599494.6
2003	477533	117.9	15.75	134.03785	1985191.83
2004	527576	129.7	15	132.3704	2263587.88
2005	561931.4	144.7	13	130.6016	2814846.1
2006	595821.6	157.1	12.25	128.2796	4027901.67
2007	634251.1	167.4	8.75	125.88	5809826.45
2008	670282.6	192.6	9.81	119	8960287.7
2009	716948.7	215.989	7.44	148.7316	9458490.2
2010	788123.3	223.25	7.83	155.68	10767377.8

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