EFFECTIVENESS OF MONETARY POLICY ON LIQUIDITY MANAGEMENT IN NIGERIA

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ABSTRACT

The paper analyzed monetary policy investigating its potency in management of liquidity in Nigeria covering a twenty eight year period of 1986 to 2013, which coincide with the emergence of SAP in the country. Hinging the background of analysis on the Keynesian Liquidity Preference Theory, the study adopted the Ordinary Least Square (OLS) using multiple regression analysis. The study found that monetary policy has not significantly influenced liquidity management in Nigeria during the study period. To this effect, the study recommended among others that the Central Bank should maintain a flexible Monetary Policy Rate so as to prevent commercial banks from liquidity surfeit. Also, the government should complement the monetary authority by providing a good regulatory environment rather than being a liability to the CBN.
Keywords: Liquidity management, monetary policy, financial ratios

1.0 Introduction

Since its establishment in 1959, the Central Bank of Nigeria (CBN) has continued to play the traditional role of regulating the stock of money in such a way as to promote social welfare (Ajayi, 1999). This role is anchored on the use of monetary policy which is usually targeted at achieving full employment equilibrium, rapid economic growth, price stability, and external balance (Adesoye, Maku and Atanda, 2012). Inflation targeting and exchange rate policy have dominated CBN's monetary policy focus in recent times based on assumption that these are essential tools of achieving macroeconomics stability (Aliyu and Englama, 2009). This according to Ezema (2009) is due to the backdrop that price stability, low unemployment and high and stable economic growth have over the years constituted internal balance measures.

While balance of payments equilibrium and exchange rate stability make up the external balance. The CBN over the years has instituted various monetary policies to regulate and develop the financial system in order to achieve major macroeconomic objectives which often conflict and result to distortion in the economy. This role of the CBN has facilitated the emergence of a more active money market where treasury bills have grown in volume and value, becoming a prominent earning asset for investors and source of balancing liquidity in the market as against the hitherto more operational informal system. However, some monetary policy tools like cash reserve and capital requirements, have been used to buffer the liquidity creation process of commercial banks through deposit base and credit facilities to the public (Ajayi and Atanda, 2012).

Monetary policy can either be expansionary or contractionary depending on the overall policy thrust of the monetary authority. By manipulating Open Market Operations (OMO), discount ratio and reserve requirements, the Central Bank controls the rate of growth of money supply, the level of interest rate, security prices, credit availability and liquidity creation through its influence on commercial bank operations. These variables in turn can exert monetary imbalances or shocks on the economy by influencing the level of investment, consumption, imports, exports, government spending, total output, income, and price level in the economy (Mishran and Pradhan, 2008). In general terms, monetary policy refers to a combination of measures designed to regulate the value, supply, and cost of money in an economy, in consonance with the expected level of economic activity (Okwu, Obiakor, Falaiye and Owolabi, 2011; Adesoye, Maku and Atanda, 2012). For most economies, the objectives of monetary policy include price stability, maintenance of balance of payment equilibrium, promotion of employment and output growth, and sustainable development (Folawewo and Osinubi, 2006).

In a bid to achieve macroeconomic goals, liquidity management is critical for the conduct of monetary policy, financial sector soundness, and economic growth. Consequently, efficient and effective management of liquidity is at the heart of the conduct of monetary policy. From the Central Bank's point of view, liquidity management is critical in delivering the mandate of monetary and price stability. Adequate liquidity promotes a sound banking and financial system which provides a virile platform for sustainable economic growth and development (CBN, 2011). Inadequate liquidity could render banks incapable of performing their traditional

functions and send wrong signals to economic agents and thereby compromise the attainments of monetary policy objectives. It could also precipitate a run in the banking system which might exacerbate structural distortions in the economy and impede the attainment of set macroeconomic goals. Excess liquidity will, however, result in inflation thus rendering the country's currency valueless. It is on this background that this paper investigated the effectiveness of the monetary policy in managing the liquidity flow and holding for speedy growth in the Nigerian economy.

The paper, therefore, assess the impact of monetary policy on liquidity management in Nigeria from 1986 to 2013 – a period which coincides with the current democratic dispensation. Specifically: the paper evaluates the effect of monetary policy on liquidity management in Nigeria and ascertained the challenges of monetary policy and liquidity management in the country. The paper is structured in five sections; Section one is the introduction which dealt with the background of the study. Section two covers the review of literature while sections three and four deals with methodology and discussion of results respectively. Finally, section five presents the conclusion and recommendations.

2.0 Literature Review

2.1 Theoretical Framework

Monetary policy got its root from the works of Irving Fisher (Diamond, 2003) who laid the foundation of the quantity theory of money through his equation of exchange. In his proposition, money has no effect on economic aggregates but price. However, the role of money in an economy got further elucidation from Keynes (1936) and other Cambridge economists who proposed that money has indirect effect on other economic variables by influencing the interest rate which affects investment and cash holding of economic agents.

However, Keynes recommends a proper blend of monetary and fiscal policies, as at some occasions, monetary policy could fail to achieve its objective. The role of monetary policy which is, of course, to influence the volume, cost and direction of money supply was effectively conversed by Friedman (1968), whose position is that inflation, is always and everywhere a monetary phenomenon; while recognizing in the short run that increase in money supply can

reduce unemployment but can also create inflation and so monetary authorities should increase money supply with caution.

Keynes' Liquidity Preference Theory, however, presents a better understanding of the role of monetary policy in an economy. He explains his liquidity preference theory in terms of interest rates. Keynes defines the rate of interest as the reward of not hoarding but parting with liquidity for a specified period. It "is not the 'price' which brings into equilibrium the demand for resources to invest with the readiness to abstain from consumption. It is the 'price' which equilibrates the desire to hold wealth in the form of cash with the available quantity of cash" (Keynes, 1936). In other words, the rate of interest, in the Keynesian sense, is determined by the demand for and the supply of money. This theory is, therefore, characterized as the monetary theory of interest as distinct from the quantity theory of the money.

In order to perceive the main theoretical innovation which Keynes introduced to the money economy, it is necessary to consider the component of demand for money itself. Considering the demand for money as a means of exchange; there are two motives behind the desire of the people to hold liquid cash: the transactions motive, and the precautionary motive (Binks and Jennings, 1986).

The extent to which money is demanded for this purpose is primarily determined by two influences: the level of real income and the rate of interest. In its simplest form, the Classical interpretation of the demand for money finishes here. Money is only held to enable the purchase of goods and services. Keynes introduced an additional motive for holding money balances. He based it upon the idea that money itself yields utility over and above that which it represented in terms of the value of the goods and services which it could be used to purchase. He believed that money is also demanded because of its perfect liquidity: it provides the holder with the ability to enter into any market transaction immediately. There is, according to this view, a demand or preference for money simply because it is the most versatile means of exchange. The concept of *liquidity preference* provides the third motive for holding money and is popularly referred to as the speculative motive.

Keynes holds that the transaction and precautionary motives are relatively interest inelastic, but are highly income elastic. The amount of money (M_1) held under these two motives is a function of (L_1) the level of income (Y) and is expressed as:

$$M_1 = L_1 (Y) \quad . \qquad . \qquad . \qquad . \qquad . \qquad . \qquad . \qquad . \ (1)$$

However, money held for speculative purpose is interest elastic and Keynes expressed it algebraically as

$$M_2 = L_2 (r) \quad . \qquad . \qquad . \qquad . \qquad . \qquad . \qquad . \qquad . \ (2)$$

where L_2 is the speculative demand for money and r is the interest rate.

When a bank operates, it acquires and disposes of income earning assets. These income earning assets constitute between one-fourth and one-third of a commercial bank's total assets. Thus, a bank's earning assets are an important source of its income. The manner in which banks manage their portfolios, that is acquiring and disposing of their income earning assets, can have important effects on the financial markets, on the borrowing, and spending practices of households and businesses and on the economy as a whole. This is determined by interest rates, which are charged by Central Banks when providing loans of a short-term nature (overnight) to banks in need of liquidity. This is intended to control money supply either on a contractionary or expansionary stance. This affects the level of bank reserves and the desire of the people to hold currency relative to deposits, which constitutes high-powered money and is a determinant of liquidity in the Nigerian economy.

2.2 Monetary Policy Appraisal in Nigeria

The responsibility for monetary policy formulation rests with the Central Bank of Nigeria (CBN). Monetary policy objective is couched in terms of maintaining price stability and promoting non-inflationary growth. The primary means adopted to achieve this objective is to set aggregate money supply targets and to rely on the open market operations (OMO) and other policy instruments to achieve the target (Ajayi and Atanda, 2012). Monetary policy in Nigeria has relied more on indirect transmission mechanisms.

Prior to the adoption of Structural Adjustment Programme (SAP), there was limit to the capital base required of commercial banks in Nigeria. Following the adoption of SAP the minimum capital base benchmark was increased. During this era, a minimum of ₦1 billion was prescribed for commercial banks and about ₦500 million for merchant bank as a result of the obstinate problem of illiquidity and poor deposit management. The limit for commercial banks was, however, increased subsequently to ₦25billion by July 2004. Similarly, in the early 1980s, banks operated under highly regulated environment through tight monetary policy characterized

by fixed exchange rate. Every signs of institutional weakness were apparent through the pre-SAP and SAP periods. A number of the banks were adversely affected in performing their primary functions in promoting the growth of the economy.

Monetary management was challenging in 2008 as a result of the liquidity surfeit experienced in the second quarter and the tight liquidity condition occasioned by the impact of the global financial crisis on the domestic economy in the third and fourth quarters of the year. The major sources of the excess liquidity in the second quarter included the disbursement of part of the excess crude oil receipts and the enhanced statutory allocations to the three-tiers of government, arising from the favourable crude oil price in the international market, as well as the payment of matured treasury bills. The financial markets, particularly the inter-bank segment, experienced relatively tight liquidity from end-August 2008, owing to the outflow of portfolio investment, occasioned by the global credit crunch. In order to ensure the stability of the financial system, the Central Bank of Nigeria undertook a number of monetary policy measures in mid-September 2008 to ensure adequate liquidity in the banking system.

Also, during the global financial crisis, the Central Bank of Nigeria reduced the Monetary Policy Rate (MPR), formerly called Minimum Rediscount Rate (MRR), from 10% to 9.75%, in order to reduce the rate at which Nigeria Commercial banks lend to the entire public for the promotion of investment and encourage saving to enhance credit creation; but this was still high. The Bank retained its policy of a market-based interest rates regime in 2008. The MPR remained the operating instrument to influence the direction of interest rate since 28th of November, 2006, when the Monetary Policy Committee of the Central Bank adopted a new monetary policy framework that took effect from December 11, 2006. The framework introduced a new Monetary Policy Rate (MPR) to replace the Minimum Rediscount Rate (CBN, 2005). In order to influence the direction of interest rate, in line with monetary conditions, the MPR was reviewed upward by 50 and 25 basis points in April and June 2008, respectively. The rate was however reviewed downward by 50 basis points in September 2008 to minimize the contagion effect of the global financial crisis.

The liquidity condition was mixed in 2008. Liquidity in the money market was relatively high in the second quarter of 2008 compared to the first quarter. The rise was mainly as a result of the enhanced statutory allocations to the three tiers of government, following the phenomenal

increase in crude oil prices in the international market and the monetization of part of the proceeds of the excess crude account. At ₦1,247.2 billion, the Bank met the September reserve money indicative benchmark of ₦1,358.7 billion. The reserve money for March, June and December, of ₦1,200.0 billion, ₦1,517.7 billion and ₦1,549.3 billion respectively, however, exceeded their respective benchmarks of ₦1,155.2 billion, ₦1,124.8 billion and ₦1,445.0 billion.

In order to ensure an optimum banking system liquidity, a number of monetary policy measures were undertaken. The measures included a review of the Monetary Policy Rate (MPR) and the cash reserve requirement (CRR) as well as the issuance of treasury bills. In the second quarter, when the system witnessed liquidity surfeit, contractionary policy measures were implemented, including an aggressive utilization of open market operations (OMO) as the main tool for managing liquidity and the upward review of the Monetary Policy Rate (MPR) from 9.5 per cent in January to 10.0 and 10.25 per cent in April and June, respectively. In addition, treasury bills were issued for liquidity management, while the cash reserve requirement (CRR) was increased by 100 basis points, from 3.0 per cent to 4.0 per cent in June 2008. By September 2008, when liquidity tightness was experienced and as a measure necessary to pre-empt the effects of the global liquidity and credit crunch on the domestic financial markets, a special meeting of the Monetary Policy Committee (MPC) was held at which the monetary policy stance was relaxed. The major monetary policy decisions taken to ensure money market liquidity were the reduction in the MPR by 50.0 basis points from 10.25 to 9.75 per cent; a reduction of CRR from 4.0 to 2.0 per cent; and a reduction of the liquidity ratio from 40.0 to 30.0 per cent (CBN, 2008).

2.3 Major Challenges in Monetary Policy and Liquidity Management in Nigeria

A major weakness in the strength of monetary policy transmission has been the unreliability of the three-year revenue and expenditure forecasts used in the medium-term expenditure and revenue frameworks. This is borne out of the unpredictability of crude oil prices and production volumes that are exogenous to the fiscal authorities. Other challenges include the lack of coordination among the tiers of government and the absence of a constitutional provision that backs the creation of an excess crude account where excess revenues could be saved. The constitution provides that all revenues should be transferred to the Federation Account and shared among the three tiers of government (CBN, 2011).

On the part of liquidity management, the financial system in Nigeria is largely structured along the dividing lines of urban/rural and formal/informal dichotomy. The combined effects of financial dualism and low level of investor awareness impede the responsiveness of market-based liquidity management initiatives. Also, unreliability of forecasts of fiscal revenue and expenditure profile, owing to the volatility of oil output and price on which about 80.0 per cent of the fiscal revenue is based, is a major challenge to liquidity management in Nigeria. In addition, the state of the payments system infrastructure is another challenge to liquidity management in Nigeria. The existing payments system infrastructure is limited in terms of reach, depth and credibility. Finally, the current bank branch to population ratio is inadequate for effective flow of liquidity in the Nigerian economy (CBN, 2011).

2.4 Empirical Review

Banks are major providers of liquidity in an economy. The field of research on the role of banks as liquidity providers started long time ago (Diamond and Dybvig, 1983). There are several documented studies on the link between monetary policy instruments and other sectors of the economy. However, some of the well-known studies are the ones, which incorporated various monetary tools in analyzing the effect of macroeconomic stability on banks' lending and activities, commodity prices, stabilization, profitability et al. Some of these studies are reviewed in this section.

Amidu and Wolfe (2008) examined the implication of monetary policy on bank lending in Ghana between 1998 and 2004 using a large panel dataset of 978 banks from 55 countries, and employing the Lerner Index Model as measure of market structure. Their study revealed that Ghanaian banks lending behaviour is affected significantly by the country's economic support and change in money supply. Their findings also support the finding of previous studies that the central bank prime rate and inflation rate negatively affect bank lending. Prime rate was found to be statistically significant while inflation was insignificant. Based on the firm level characteristics, their study revealed that bank size and liquidity significantly influence bank's ability to extend credit when demanded.

Younus and Akhta (2009) examined the significance of Statutory Liquidity Requirement (SLR) as a monetary policy instrument in Bangladesh. Using descriptive analysis techniques like trend analysis and summary statistics, they found that statutory liquidity requirement has

experienced infrequent changes. SLR and Cash Reserve Requirement (CRR) were found to be significant tools of reducing inflation and are used only in situation of drastic imbalance resulting from major shocks. They posited that Bangladesh Bank has used open market operations (OMOs), more frequently rather than changes in the Bank rate and SLR as instruments of monetary policy in line with its market-oriented approach.

Masagus, Henri, Peter and Piet (2010) present the findings of a meta-analysis identifying the causes of variation in the impact of monetary policies on economic development. The sample of observations included in their meta-analysis was drawn from primary studies that uniformly employ Vector Autoregressive (VAR) models. Their findings reveal that capital intensity, financial deepening, the inflation rate, and economic size are important in explaining the variation in monetary policy outcomes across regions and over time. Differences in the type of models used in the primary studies also significantly contribute to the explanation of the variation in study outcomes.

Amassoma, Nwosa and Olaiya (2011) appraised monetary policy development in Nigeria and examined the effect of monetary policy on macroeconomic variables in Nigeria for the period 1986 to 2009. They adopted a simplified Ordinary Least Squared technique and conducted the unit root and co-integration tests. The findings showed that, monetary policy has witnessed various policy initiatives and has experienced sustained improvement over the years. The result also shows that, monetary policy has a significant effect on exchange rate and money supply but insignificant influence on price instability. The implication of this finding is that monetary policy has a significant influence in maintaining price stability within the Nigerian economy. The study concluded that, for monetary policy to achieve its other macroeconomic objective such as economic growth; there is the need to reduce the excessive expenditure of the government and align fiscal policy along with monetary policy measure.

Okwu, et al (2011) examined the effects of monetary policy innovations on stabilization of commodity prices in Nigeria. Consumer price index (CPI), broad money aggregates (BMA) and monetary policy rate (MPR) were applied to a multiple regression model specified on perceived functional link between the indicators of Central Bank of Nigeria's monetary policy innovations and commodity prices indicator. The result showed that positive relationship exists between the respective indicators of monetary policy innovations and indicators of commodity

prices. Also, monetary policy rate had more immediate effect than broad money on consumer price index. And that commodity prices responded more to monetary policy rates than to broad money aggregates. Although both broad money and monetary policy rate exerted positive effect on commodity prices, only broad money exerted significant effect at 0.05 level of significance. However, overall effect of both on commodity prices was statistically significant. Consequently, the study recommended, among other things, that the Central Bank of Nigeria should always determine optimal mix of both policy variables to ensure stabilization of consumer goods and other commodity prices, and engender confidence in the Bank's monetary policy.

Abiodun and Tokunbo (2006) examined the efficacy of monetary policy in controlling inflation rate and exchange rate instability in Nigeria. The analysis performed was based on a rational expectation framework that incorporated the fiscal role of exchange rate. Quarterly data from 1980 to 2000 were used to conduct time series test. The result showed that monetary policy has influenced government fiscal deficit through the determination of the inflation tax rate which affects both the rate of inflation and the real exchange rate, thereby causing volatility in their rates. The study reveals that inflation affects volatility of its own rate, as well as the rate of real exchange. The policy import of the paper is that monetary policy should be set in such a way that the objective it hopes to achieve is well defined.

Mbutor (2010) evaluated the role of monetary policy in enhancing remittances for economic growth. The vector autoregressive method was applied with two stage deductions. Monetary policy rate was found to have impact on intervening variables – exchange rate, interest rate and inflation, which in turn impact remittance flows. The data set were tested for temporal properties, including unit roots and co-integration. Preliminary evidence shows that domestic economic prosperity increases remittances to Nigeria, while exchange rate depreciation depresses remittances. The latter outcome reflects remitters' perception that a stronger Naira is a sign of things-getting-better-back-home.

Hameed, Khaid and Sabit (2012) presented a review of how monetary policy influences Gross Domestic Product (GDP) of Pakistan. The method of OLS was used to explain the relationship between the variables under study. Tight monetary policy with balanced adjustments in independent variables (money supply, interest rates, exchange rates and inflation) showed a positive relationship with dependent variable.

The work of Somoye and Ilo (2009), on the impact of macroeconomic instability on the banking sector lending behaviour in Nigeria between 1986 to 2005, also revealed the transmission mechanism of monetary policy shocks to banks operation. The result of co-integration and Vector Error correction showed that there exist long-run relationship between bank lending and macroeconomic instability.

Folawewo and Osinubi (2006) investigate how monetary policy objective of inflation control and intervention in the financing of fiscal deficits affect the variability of inflation and real exchange rate in Nigeria. The analysis was done using a rational expectation framework that incorporates the fiscal role of exchange rate. Using quarterly data spanning over 1980: 1 to 2000: 4, and applying time series test on the data used. The study reveals that inflation affects volatility of its own rate as well as the rate of real exchange. The study concludes that, monetary policy objective should be well defined and be set in an achievable way.

3.0 Method of Study

This study adopted the Ordinary Least Square (OLS) technique for data analysis. The OLS is employed to measure the causal effect relationship between monetary policy and liquidity management in the Nigerian economy from $1986 - 2013$. To examine the impact of monetary policy on liquidity management in Nigeria, this study took a clue from Onyeiwu (2012) which also adopted the Keynesian Liquidity Preference Theory to specify his model.

However, in this study, the models are modified to fit the stated objective. The dependent variable in the model is Money Supply Growth Rate (M_2). Banks are the ultimate supplier of liquidity in the economy; hence the effectiveness of monetary policy will be examined under the framework of commercial banks for the purpose of measurability.

Cash Ratio (CR), Liquidity Ratio (LR), Minimum Rediscount Rate (MRR), Interest Rate (INR) and Treasury Bills Rate (TBR) are used as explanatory variables in the models. The secondary data was obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank Estimates for Nigeria. The model is specified below:

The definitional equation is given as;

$$M_2 = f \text{ (CR, LR, MRR, INR, TBR)}$$

The stochastic form of the equation is given as;

$$M_2 = \beta_0 + \beta_1 CR + \beta_2 LR + \beta_3 MRR + \beta_4 INR + \beta_5 TBR + \mu$$

Where; M_2 = Money Supply Growth Rate

CR = Cash Ratio

LR = Liquidity Ratio

MRR = Minimum Rediscount Rate

INR = Interest Rate

TBR = Treasury Bills Rate

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are parameters to be estimated

μ = the error term

4.0 Data Analysis

4.1 Data Presentation

The table below shows the mean of the variables (CR, LR, MRR, INR and TBR), their standard deviation (which is the divergence of a variable from its mean), the median, maximum and minimum values and other descriptive statistics.

Table 1: Descriptive Statistics

	CR	INR	LR	M2	MRR	TBR
Mean	8.303571	22.56250	45.70000	26.85750	13.74786	12.72857
Median	9.550000	21.44500	45.75000	24.23000	13.50000	12.37500
Maximum	12.00000	36.09000	64.10000	57.88000	26.00000	26.90000
Minimum	1.000000	12.00000	29.10000	1.200000	6.130000	3.720000
Std. Dev.	3.178572	4.704404	9.229983	15.57419	4.064923	4.943600
Skewness	-1.051487	0.808493	0.102519	0.289866	0.727977	0.670881
Kurtosis	2.763090	4.525392	2.638890	2.209056	4.407347	3.917257
Jarque-Bera	5.225059	5.765042	0.201181	1.121961	4.783832	3.081969
Probability	0.073349	0.055993	0.904303	0.570649	0.091454	0.214170
Sum	232.5000	631.7500	1279.600	752.0100	384.9400	356.4000
Sum Sq. Dev.	272.7896	597.5483	2300.200	6548.994	446.1373	659.8579
Observations	28	28	28	28	28	28

Source: Author's Computation from Eviews 7

Deductions made from table 1 above show that the mean (or average values) for the variables M_2, CR, LR, MRR, INR and TBR for the period 1986 – 2013 were 26.86, 8.30, 45.70, 13.74, 22.56 and 12.73 respectively. The maximum value for CR is 12.00 and was recorded in year 2013 while the minimum value is 1.00 recorded in 2009. INR has its maximum value to be 36.09 in 1993 with its corresponding minimum value as 12.00 in 1986. 64.10 in 2000 and 29.10 in 1992 were the maximum and minimum values respectively for LR. In 2013 INF recorded its

lowest rate of 1.20 while its highest value was 57.88 in 2008. MRR has its maximum and minimum values to be 26.0 in 1993 and 6.13 in 2010. For TBR the maximum value is 26.90 in 1993 and its corresponding minimum 3.72 in 2009. The estimated standard deviation of the parameter estimates are 3.18, 4.70, 9.22, 15.57, 4.06 and 4.94 for CR, INR, LR, M_2, MRR and TBR while the median of the same parameters are 9.55, 21.45, 45.75, 24.23, 13.50 and 12.38. Note, the variables used in the model, are all expressed in their respective growth rate.

The Jarque-Bera test of normality is conducted to determine if the data being analysed using OLS technique conforms to the conditions of normality i.e. having a mean of 0 and constant variance. The JB test of normality is based on OLS residuals − using skewness and kurtosis (under normality, $S = 0$ and $K = 3$). It is used to determine the joint hypothesis that S and K are 0 and 3 respectively. Skewness is the measure of asymmetry of a probability distribution about its mean while kurtosis is the measure of tallness or flatness of the slope.

If $K < 3$, then it is platykurtic (flat or short tailed); if $K > 3$, then it is leptokurtic (slim or long tailed) and if $K = 3$, then it is mesokurtic (normal distribution). Hence, from the table above: INR, MRR and TBR are positively skewed and leptokurtic; CR is negatively skewed and platykurtic while LR and M_2 are positively skewed and platykurtic. This shows that the data have violated the normality assumption of OLS. This is further substantiated by the high probability values of the statistics, which have reported above 5% level of significance. This, therefore has set the basis for further tests.

4.2 Graphical Trend of Data

This shows the trend in the data specified for the analysis

Figure 1: Data Trend
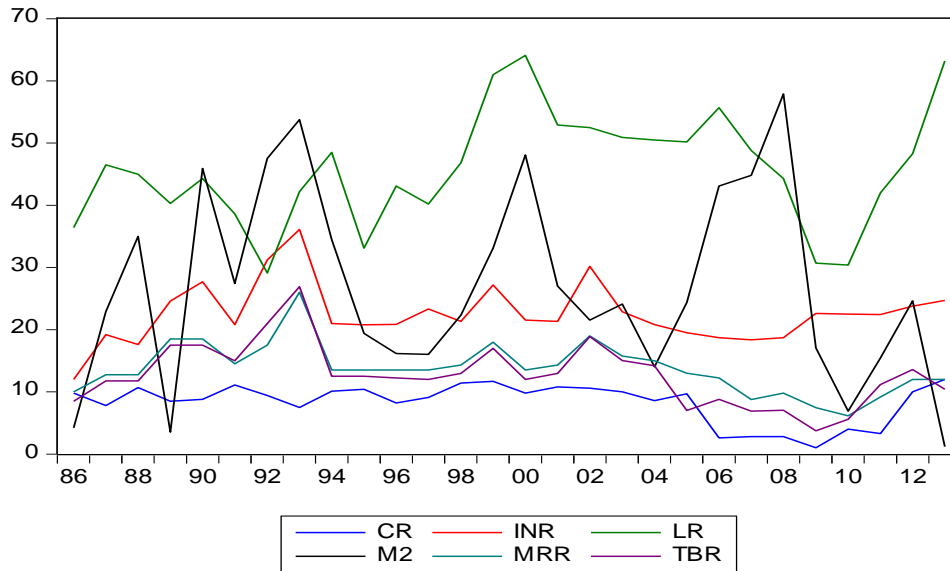
The graphs above show the trend of monetary policy tools and money supply for the past 28 years. Liquidity Ratio has been a bit stable. Stable in the sense that commercial banks have been able to meet up with the prescribed minimum by the Central Bank over the last 27 years. Unlike Liquidity Ratio the Central Bank has been unable to control Money Supply over the last 28 years. For Money Supply, apart from 1986 and 1989 which recorded a 4.23% and 3.54% growth rate, money supply has been high even though fluctuating and this trend averaged about 35% growth rate before dropping to 6.91% in 2010 – 21 years later. However, the growth rate of 1.20% in 2013 portends hope for the future.

The Minimum Rediscount Ratio have been relatively stable ranging from 6.13% - 26% between 1986 and 2013 indicating low interest rates charged to commercial banks which encourages borrowing. Similarly, Cash Ratio has also been relatively stable with a drastic reduction from 9.7% in 2005 to 2.6 in 2006 and maintained that average until it rose to 10% in 2012. Treasury Bills Rate has also been stable though high with its lowest rate as 12% recorded in 1986 and has never been less which is favourable for a contractionary monetary policy stance.

Subsequent sections will reveal if this wobbling trend of monetary policy variables has actually impacted significantly on liquidity management in the Nigerian economy or not.

4.3 Result and Discussion

The result of the unit root test which is a prerequisite to the regression analysis is as follows.

Table 2: Stationarity Test

Variables	ADF Test Statistics	1% critical value	5% critical value	10% critical value	Order of Integration
TBR	-5.93	-3.71	-2.98	-2.63	I(0)
M_2	-3.75	-3.70	-2.98	-2.63	I(0)
INR	-4.22	-3.69	-2.98	-2.62	I(0)
CR	-5.84	-3.71	-2.98	-2.63	I(0)
MRR	-5.43	-3.72	-2.99	-2.63	I(0)
LR	-4.78	-3.71	-2.98	-2.63	I(0)

Source: Author's Computation from Eviews 7

The result reveals that the variables are stationary at level series. The ADF test statistic (taking absolute values) for each variable in comparison to the critical values buttresses this point – since the former is greater than the latter (for each variable) at all significant levels.

The granger causality test was used to determine whether one time series is useful in forecasting another. The Granger causality tested the direction of causation between monetary policy variables and liquidity ratio in Nigeria and whether the former contains possible information about the latter in the future. The result is presented below:

Table 3: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
M2 does not Granger Cause LR	26	3.34988	0.0546
LR does not Granger Cause M2		0.03523	0.9654
MRR does not Granger Cause LR	26	3.88531	0.0367
LR does not Granger Cause MRR		1.49827	0.2465
TBR does not Granger Cause MRR	26	3.35058	0.0546
MRR does not Granger Cause TBR		3.14874	0.0637

Source: Author's Computation from Eviews 7

The result shows that there is a unidirectional relationship between M_2 and LR; MRR and LR and TBR and MRR. It further reveals the dominance of M_2 and MRR in predicting the outcome of LR in future but not vice versa. This is established from the probability which indicates a value of 5% or less to nullify the hypothesis that M_2 and MRR do not granger cause

LR. Also TBR granger causes MRR but not vice versa. The result of the other combinations reveals no causality between the variables. This clearly portends that none of the monetary policy tools except TBR contain future information about M_2 given the period of study.

The result of the regression analysis is given as follows.

Table 4: Regression Analysis

M_2	= 11.21 – 2.88CR + 0.46LR + 1.28MRR – 0.61INR + 1.18TBR					
$S(b_i)$ =	(21.26)	(1.15)	(0.34)	(2.14)	(1.02)	(1.95)
t^* =	(0.53)	(-2.49)	(1.34)	(0.60)	(-0.60)	(0.60)
$t_{(0.025)}$ = 2.06, R^2 = 0.31, Adjusted R^2 = 0.15, F^* = 1.96, $F_{0.05}$ = 2.66, DW = 2.01						

Source: Author's Computation from Eviews 7

The adjusted R^2 which gives a better measure of the proportion of the total variation in the dependent variable explained by the variation in the independent variables reveal that 15% of the variations in M_2 are accounted for by CR, LR, MRR, INR and TBR. However, 85% of the total variation in M_2 is unexplained by the regression equation. The 0.15 coefficient of determination shows a weak relationship between the explanatory variables (CR, LR, MRR, INR and TBR) and the dependent variable (M_2). This implies that monetary policy tools are still ineffective in controlling money supply in the Nigerian economy and this is in line with observed realities.

The values of the coefficients imply that a 1% increase in CR will reduce M_2 by 2.88%. Similarly, a 1% increase in INR will cause M_2 to decrease by 0.61%. However, a 1% increase in LR will increase M_2 by 0.46%. The same holds for MRR and TBR with a 1% increase spurring M_2 growth by 1.28% and 1.18% respectively. All variables conform to a priori expectation except MRR and TBR.

Apart from CR, all other explanatory variables are statistically insignificant. From the result, it is clear that the estimates of LR, INR, MRR and TBR are not statistically significant ($t^* < t_{0.025}$) at 5% level of significance. This result therefore reveals that monetary policy has no significant effect on liquidity management in Nigeria.

The F-statistic shows that the F calculated (1.96) value is less than the F tabulated (2.66). This shows that the overall explanatory power of the regression equation is statistically insignificant. This insignificance also supports the fact that in reality, monetary policy tools have over time failed to exert as much influence on the Nigerian economy due to the high level of

financial non inclusion in the economy. A large volume of transactions in the economy are carried out in the informal sector, completely independent of the banking and other organized financial institutions through which monetary policy operations are channeled.

The Durbin Watson test of autocorrelation validates the null hypothesis of no autocorrelation. The result of the regression analysis shows the estimated d value to be 2.01 suggesting the near absence of serial correlation. From the Durbin Watson tables, we find that for 28 observations and 5 explanatory variables, $d_L = 1.028$ and $d_U = 1.850$ at the 5% level. Since the computed d value lies in the region $(d_U < d < 4 - d_U)$, we conclude that there is no autocorrelation in the data series either positive or negative.

5.0 Conclusion and Recommendations

The study concludes that, monetary policy has not significantly impacted liquidity management in Nigeria. This is in line with the works of Folawewo and Osinubi (2006) and Amassoma, Nwosa and Olaiya (2011). Though the time period covered 1986 – 2009 as against the 1986 – 2013 of this study differs minimally, the finding of non significant impact buttresses the fact that the challenges of monetary policy effectiveness in Nigeria still persists. These are issues of cash based economy, large proportion of informal sector, weak payment system and general non popularity of the monetary policy tools that are been deployed.

This study recommends therefore that, the Central Bank should maintain a flexible Monetary Policy Rate so as to prevent commercial banks from suffering liquidity surfeit but enable them channel funds to their most remunerative alternative employments such as converting investment opportunities, meeting unexpected cash withdrawals, and reducing the tendency of having excess idle cash, which may be detrimental to profit maximization. Furthermore, the commercial banks should adopt measures in addition to profitability that will ensure effective liquidity management. The measures will help to minimize or avoid cases of excess liquidity or illiquidity.

The government should complement the Central Bank by providing a good regulatory environment that will encourage the conduct of monetary policy rather than being a liability to the CBN. In addition, the CBN should effectively control money supply in the Nigerian economy to curb inflation (enhancing the store of value function of money) subsequently leading to a high

purchasing power parity of money. A contractionary stance of monetary policy will be more effective in regulating the quantity of broad and base money supply.

Due to the nature of liquidity management in the Nigerian economy, a regulatory authority should be put in place with appropriate policy and compliance measures to check high volume of cash transactions endemic in the economy. This is important because Nigeria operates solely on large volume of cash transactions as a result of the dominance of fiscal policy over monetary policy (due to large percentage of informal sector). In view of this, the conduct of monetary policy in checking liquidity may be limited. Efforts should therefore be made by the authorities to expand the payments system infrastructure and strengthen the supervisory and regulatory framework of the banking sector in Nigeria.

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APPENDIX - RAW DATA (GROWTH RATE)

YEAR	LR	M$_2$	MRR	CR	TBR	INR
1986	36.4	4.23	10.00	9.8	8.50	12.00
1987	46.5	22.92	12.75	7.8	11.75	19.20
1988	45.0	34.99	12.75	10.7	11.75	17.60
1989	40.3	3.54	18.50	8.5	17.50	24.60
1990	44.3	45.92	18.50	8.8	17.50	27.70
1991	38.6	27.43	14.50	11.1	15.00	20.80
1992	29.1	47.53	17.50	9.4	21.00	31.20
1993	42.2	53.76	26.00	7.5	26.90	36.09
1994	48.5	34.50	13.50	10.1	12.50	21.00
1995	33.1	19.41	13.50	10.4	12.50	20.79
1996	43.1	16.18	13.50	8.2	12.25	20.86
1997	40.2	16.04	13.50	9.1	12.00	23.32
1998	46.8	22.32	14.31	11.4	12.95	21.34
1999	61.0	33.12	18.00	11.7	17.00	27.19
2000	64.1	48.07	13.50	9.8	12.00	21.55
2001	52.9	27.00	14.31	10.8	12.95	21.34
2002	52.5	21.55	19.0	10.6	18.88	30.19
2003	50.9	24.11	15.75	10.0	15.02	22.88
2004	50.5	14.02	15.00	8.6	14.21	20.82
2005	50.2	24.35	13.00	9.7	7.00	19.49
2006	55.7	43.09	12.25	2.6	8.80	18.70
2007	48.8	44.80	8.75	2.8	6.91	18.36
2008	44.3	57.88	9.81	2.8	7.03	18.70
2009	30.7	17.07	7.44	1.0	3.72	22.62
2010	30.4	6.91	6.13	4.0	5.60	22.51
2011	42.0	15.43	9.19	3.3	11.16	22.42
2012	48.3	24.64	12.00	10.0	13.60	23.79
2013	63.2	1.20	12.00	12.0	10.42	24.69

Source: CBN Statistical Bulletin and World Bank Estimates (Nigerian Statistics)