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Monetary Policy And Deposit Money Bank Liquidity In Nigeria

Akinrujomu, Fayokemi Toluwani[1]; Akinrinola, Olalekan[1] & Ojomolade, Dele[1]

[1]Department of Accounting,
Caleb University, Lagos State, Nigeria

ABSTRACT
This study analyzes the effect of monetary policy and its three components; Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR), and Open Market Operations (OMO) surrogated with Currency-in-Circulation (CIC) on the liquidity of Deposit Money Banks (DMBs) in Nigeria. The purpose is to evaluate if these monetary policy frameworks affect the liquidity position of banks from the year 2007 to 2023. Ex post facto design was adopted and the data were collected from the CBN statistical bulletin. The study applied the Ordinary Least Squares (OLS) regression. Prior to the estimation, all variables were subjected to unit root tests, co-integration and vector error correction model (VECM) to ensure stationarity. The findings indicates that no monetary policy instruments during the period under study meaningfully impacted deposit money banks' liquidity. The CRR and CIC had positive, but non-significant coefficients, while MPR was negative and statistically non-significant. The study concludes that there is a weak policy framework in Nigeria as the traditional monetary policy tools fail to have a significant impact on liquidity of the banks. It is therefore, concluded that monetary policy, as practiced these days, might be insufficient in controlling banking liquidity on a short-term basis. The study suggests restructuring Nigeria's monetary policy system with the incorporation of some market instruments and better management of liquidity at the banking level. A more comprehensive framework of monetary regulation, shifting focus towards flexible control mechanisms for banking sector liquidity in Nigeria.
Keywords: Monetary Policy, Bank Liquidity, Monetary Policy Rate, Open Market Operations, Currency-in-Circulation

1.0 INTRODUCTION

Global economic policy instruments are wielded by the central banks to foster the achievement of desired economic outcomes. The Central Bank of Nigeria (CBN) employs monetary policy aimed at achieving price stability, inflation control, and financial system liquidity management (Omankhanlen & Okoye, 2021). In Nigeria, the liquidity of Deposit Money Banks (DMBs) is an important economic parameter because it determines the volume of credit, capital investment, and the overall economic growth (Akinola & Ogbeifun, 2019). The CBN uses the Cash Reserve Ratio (CRR) and Monetary Policy Rate (MPR), as well as Open Market Operations (OMO), to directly control the money supply, inflation rate, and banking sector liquidity (Obi-Nwosu & Aginam, 2019). The ability of the DMBs to lend credit determines economic activities of businesses and individuals in Nigeria and most developing countries (Fadare, 2011).

Every economy across the globe faces its own unique issues that define it, such is the case with the Nigerian economy which relies heavily on exports of oil and is frequently abused by economic shocks, external threats and inflationary pressure. This makes the framework of the monetary policy becomes a priority. The Central Bank of Nigeria (CBN) tightly regulates the monetary policy within the framework

of the inflation. However, altering the policies in place does affect the overall liquidity of the banks. Cash reserve requirement and the monetary policy rate, for instance, are structured in a way that simultaneously ensures that the banks hold enough cash while also limiting lending liquidity which eventually hampers economic growth.

Unlike the vast number of writings available revolving around the monetary policy and banking systems, Nigeria suffers from external oil price shocks and inefficient exchange rate which make the available literature on the interaction of these aspects with liquidity very scarce. The gap that exists in understanding the available research revolves around the active semidirect instruments of monetary policies making their specifics known to the liquidity of the banking institutions. It is beyond doubt that the volume of research available towards Nigerian monetary policy is vast, however with the persistence of economic problems and policies so vastly oscillation, the relations between the tools and bank liquidity has been neglected which is a question that needs to be solved.

Even though it has a profound impact on both the economic growth and financial stability of Nigeria, the nexus between the monetary policy and liquidity of deposit money banks in the country has not been given adequate attention. Various scholars have analyzed the impacts of some monetary policy instruments like the CRR and MPR on liquidity in Nigerian banks and most do not consider the peculiarity of Nigeria's macroeconomic structure which includes exchange rate fluctuations, global oil prices, and inflation subdised banking sector's liquidity (Omankhanlen & Okoye, 2021). Any monetary policy activity, especially those relating to the CRR and MPR, is anticipated to restrict or enhance liquidity in accordance with the policy stance taken (Obi-Nwosu & Aginam, 2019). For instance, an increase in CRR limits the pool of money available to banks for lending which in turn decreases their liquidity position, while easier MPR increases the liquidity position as borrowing is made less expensive. Even so, the effect of such policy tools on liquidity is much more complex and is dependent on the overall economic environment, for instance: inflation, exchange rate, and prices of commodities in the international markets (Alalade et al., 2020).

One of the other noticeable gaps in literature is the absence of comprehensive analysis on how these policies function simultaneously with other components, particularly the concentration of non-performing loans (NPLs) in banks. The liquidity of banks, particularly during periods of high economic volatility, is often strained by NPLs. However, the literature on the combined impact of NPLs, monetary policy, and liquidity remains limited. (Akinola & Ogbeifun, 2019). Taking into consideration the overwhelming importance of NPLs in economically constraining the lending capital, as it is economically challenging to ignore NPLs along with the policy tools of the CBN so as to manage liquidity effectively in the banks (Ibitomi & Mike, 2021).

Furthermore, most studies tend to emphasize the immediate impacts of monetary policies on liquidity and ignore the permanent changes banks may prepare for that stem from policy implementation over a longer period. Such changes are particularly necessary in a country like Nigeria, which is often subject to changing policies and external shocks, and thus determines the need for more drastic changes in asset distribution as well as in lending policies. (Toro & Emmanuel, 2020). Therefore, there is an urgent need for extensive empirical research that considers both the short term and long-term effects of monetary policies on the liquidity of the banks in Nigeria.

The absence of detailed analyses examining the responses of banks of different sizes to changes in monetary policy is an additional major gap in the literature. Medium-size banks and smaller, less well-capitalized banks with limited portfolios may suffer more acute impacts from monetary policy shifts (Okaro & Nwakoby, 2016). The existing literature does not adequately address these factors, making it problematic to draw conclusions for the entire banking industry. This poses a problem Edem (2017) identifies as an opportunity to investigate how different banks' financial resources and risk exposure impact their response to monetary policy changes.

Aside from this, there is little analysis of the impact of the regulatory changes in Nigeria, especially after the bank consolidation phase, on the liquidity policies of deposit money banks. There is now a greater chance of more sophisticated and professionally managed financial institutions resulting from

consolidation in Nigeria, but there is no clear explanation on how liquidity management is affected and what the responses of these larger institutions to monetary policy changes are in comparison to smaller and less capitalized banks (Akinola & Ogbeifun, 2019).

As stated in the early chapters, the existing research on the impact of monetary policy on liquidity of banks in Nigeria is abundant, yet fails to offer adequate concern on the macroeconomic aspects. Thus, the target of this study is to explain the adoption of monetary policy instruments in conjunction with non-performing loans and the liquidity crisis of Nigerian deposit money banks. In doing so, it is expected that the policies formulated will aim towards fostering financial stability and economic growth in Nigeria.

The focus of this study is to fill the gaps identified by analyzing the strategies employed by the Nigerian deposit money banks in response to movements in some key monetary policy instruments such as the Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR) and Open Market Operations (OMO). This study hopes to contribute to the discourse of Nigeria's monetary policy and its impact on the stability of the banking sector during these challenging times from both domestic and international perspectives (Ibitomi & Mike, 2021).

The remaining part of this study covers the literature review, methodology, data analysis, discussion of findings, conclusion and recommendations.

2.0 LITERATURE REVIEW

Monetary Policies

Monetary policy is one of the most important tools that determine the economic wellbeing of a country's economy through managing inflation, employment, and the financial system. Usually, it is undertaken by central banks with the use of various tools such as interest rates, open market operations, reserve requirements, and, more recently, unconventional ones like quantitative easing (Shannon et al. 2023). To put it differently, monetary policy represents a systematic approach to manage the money supply and credit availability in relation to the more general economic objectives such as the stability of prices and the long-term development of the economy.

In monetary policy, a crucial issue is the effect it has on liquidity in the banking system. Liquidity is defined as the existence of liquid resources in the economy that the banks use to provide funds for other services. The central banks manage the liquidity of the banks by altering the policy interest rate or reserve requirements (Gallegos & Kramer, 2022). For instance, when a central bank's policy rate is raised, the expense of borrowing becomes higher, which may reduce liquidity in the banking sector because banks are indisposed to lend (Peykani et al., 2023). On the other hand, lowering the rates normally encourages the banks to give out more loans, thereby increasing liquidity, and enabling the banks to provide further loans and expand economic growth.

The interplay of monetary policy and liquidity creation is equally relevant to financial stability. Prudent liquidity management enables banks to meet short-term obligations while sustaining economic activities through lending. On the other hand, inefficient management of liquidity may worsen financial instability during periods of complacency (Peykani et al., 2023). The capability of central banks to provide liquidity into the banking system during financially distressful periods is significant in averting a liquidity crisis since, without swift action, such a vacuum may exist that pulls in the entire economy.

In developing economies, which host external shocks, say, the fluctuation in the prices of primary goods or the volatility of the exchange rate, the linkage of monetary policy with liquidity becomes more sophisticated. For example, some researchers propose that for markets like the Nigerian one, the monetary policy's impact on liquidity is often mediated by external conditions, which include oil prices or foreign reserves (Akeem et al., 2022). Additionally, the influence of government action, such as through fiscal policy, may further obfuscate the linkage between monetary control and liquidity management in the banking system.

Bank Liquidity

The term 'bank liquidity' describes a bank's capacity to settle its short-term obligations without incurring large losses. Liquidity is integral to the stability of a system, and for banks, it determines their capacity to

extend credit, assume risks, and react to economic activities. The loan-to-deposit ratio, reserve requirements, and cash flow and liquidity management methods are all components that determine a bank's liquidity position, which impacts a bank's operational and strategic outcomes. Liquidity management is one of the most important current tasks of a single commercial bank and of the banking system as a whole. An asset can be defined as a good to be sold or a claim to cash, and the sale must take place within a short time period. Highly liquid banks are typically able to extend more credit without restrictions; however, at some point their liquidity may be so low that they would not be able to survive (Yeasin, 2023).

In the past few years, due to the external factors like shifts in economic policy or other economic shocks, the impacts of liquidity risk have increased substantially. A liquidity crisis may create a more expensive environment for borrowing, curtail credit supply, and limit economic activity. Further, research also points to the impact liquidity has on banking activity profitability. This can be refreshing to some; however, it is important to note that banks need to also maintain proper liquidity levels. Excess reserves could be more valuable if they were put to use in more profitable endeavors. The struggle between keeping cash or investing is perpetual for financial institutions. Some research suggests banks that can achieve an optimal mix of illiquid and profitable assets perform better over the long term (Eltweri et al., 2023).

Furthermore, the adoption of Basel III and other frameworks have affected how banks handle liquidity. For instance, both the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) necessitate that a bank possesses adequate liquid assets to weather severe market disturbances. These measures seek to mitigate the possibilities of liquidity crises and improve the stability of overall financial systems around the world (Eltweri et al., 2023).

Cash Reserve Ratio

This is a critical instrument of monetary policy utilized to manage the level of liquidity of the banking system is the ratio of maintained deposits to a bank's total deposits which are required to be held 'in reserve' as cash or in a non-interest-bearing current account with the Reserve Bank of India (RBI). The cash reserve ratio is helpful in managing the rate of inflation and the stability of a currency, as well as in ensuring that a stable banking sector (Mia et al., 2023). Central banks reduce the lending potential of commercial banks with the help of 'reserve requirements' which control the amount of money that a bank can lend out.

CRR has multiple implications on banks. While higher CRR restricts credit availability in the economy which decreases money supply thereby helping in controlling inflation, in higher ratios it might lead to poor economic growth (Evbayiro-Osagie & Tan 2023). In contrast, lowering the CRR facilitates an increase in credit availability boosting economic activity, while increasing the risk of inflation and financial instability (Anggraeny & Suhasto, 2024).

Recent analysis indicates that the cash reserve ratio (CRR) significantly impacts the profitability and operational activities of banks. An investigation into the banking industry in Bangladesh showed that high CRR has a negative impact on the profitability of banks because it limits their capacity to generate income from loans and investments (Mia et al, 2023).

On the contrary, when CRR is appropriately set, it allows the banks to achieve an adequate liquidity level, which assists in meeting operational needs, particularly during periods of financial distress (Bortoluzzo & Bortoluzzo, 2023). The CRR also acts as a key instrument for the central banks in the management of the economic cycle. By varying the requirements of CRR, central banks can control the currency supply in circulation. For example, in a recessionary period, the CRR can be lowered to encourage more lending and economic activities. And, to curb the overly active economy, the CRR can be increased (Mia et al, 2023).

Monetary Policy Rate (MPR)

One of the instruments in use for the control of economic in central banks is the Monetary Policy Rate (MPR). With the implementation of MPR, the government can also influence inflation, stimulate or cool down the economic activity, and control the cost of borrowing. The MPR is the interest rate at which a

central bank lends money to commercial banks. The setting and implementation of MPR affects broader economies interest that impacts consumer spending, investment decisions, and economic growth as whole (Jothr et al., 2023).

Usually in response to increased inflation, central banks have the tendency to rise the MPR in an attempt to lower the discretionary spending by economically slowing down the circulation to amount of monetary currency in public usage. Tightening spending cash limits have also proven to interfere with inflation with the downside of weakening economic growth and increasing the cost of borrowing both for consumers and businesses. Conversely, in the event of stale or recessionary economy, there is a tendency for central banks to lower MPR in an attempt to incentivize borrowing which in turn attempts to boost economic activity (Rathnayaka et al., 2023).

In a recent study by Ma and Zimmermann (2023), the authors illustrated that the effects of the MPR (Monetary Policy Rate) are two-pronged. Their primary concern was the trade-off between an inflation targeting approach and an economic growth approach in the context of the MPR. For example, Pugh (2023) noted that while an increase in MPR may successfully curb inflation, it could also dampen economic productivity, innovation, and entrepreneurship in capital-intensive industries. This challenge is especially profound for central banks under the pressure of external shocks like the COVID-19 pandemic or global supply chain disruptions.

The influence of MPR on financial markets and household behaviors is noteworthy. As per Jothr et al. (2023), changes in the central MPR also change the probability of pass-through effect, whereby the actions of the monetary authority affect the lending rates of commercial banks which in turn affect the borrowing habits, spending and consumption patterns. In addition, the literature suggests (Rathnayaka et al., 2023) that increased consumption MPRs typically lead to an increased price of household's debt which is likely to decrease consumption by these households and also decrease business investment.

Open Market Operations (OMO)

Open market operations or OMOs work with the buying and selling of government securities in attempt to control inflation and effectively manage the money supply. To increase liquidity in the economy, a central bank will purchase said securities, thus reducing interest rates. This allows for increased borrowing and investment opportunities. On the other hand, selling securities increases the interest rate, which reduces further investment and inflation (Alemu, 2023). Burdekin and Nguyen (2023) attest to the importance of these mechanisms by arguing that they serve the primary purpose of ensuring monetary policy goals of employment and inflation are achieved. Like most economic phenomena, OMOs effectiveness depends on several economic aspects such as market liquidity, the banking industry's performance, and economic activity. More recent research indicates that OMOs are an important instrument for the management of short-term interest rates and contain inflation in both advanced and developing economies. For example,

A study conducted on Nigeria demonstrated the use of OMOs in liquidity management and currency stabilization whereby central banks sought to cushion inflationary shocks and manage market expectations (Alemu, 2023). In the absence of credible financial markets or weak banking systems, economic de-stabilization and inflation containment through the use of OMOs becomes unlikely (Alemu, 2023). Moreover, as Otor and Yua (2023) research demonstrated, OMOs effectiveness in circumvention of forward-looking sanctions or profound market distortions tends to be relatively obsolete, thus making them an inefficient policy instrument.

Theoretical Review

Quantity Theory of Money

The theory developed by Irving Fischer (1911), Theoretical Quantities of Money, argues that an increase in money supply leads to a proportional increase in prices. As a result, liquidity in the banking system will subsequently be affected. This theory is premised on the assumption that the rate of money circulation is constant, and that inflation, economic activities and liquidity all have a direct relationship with the money supply. However, in the view of these authors, the theory fails due to a lack of realism in

relations such as those between money demand, financial changes, and external effects (Afrogha & Tyohen, 2023). Also, in developed market economies with relatively sophisticated banking structures like Nigeria, the relationship where an increase in money supply leads to inflation does not hold, since other variables like government expenditure and changes in foreign exchange rates dominate (Alemu, 2023).

Moreover, another important theory is Keynesian Economics, principally from John Maynard Keynes' (1936) liquidity preference theory. This theory states that banks' liquidity choices are premised on their preferences for holding money as a potential buffer against expenditure, thus restricting their capability to extend credit. The assumption here is that the central banks make interest rate decisions based on how much of the banks' liquidity reserves they wish to control, which in turn influences the working and functioning of these banks and their willingness to lend. Nevertheless, the opposing view suggests that the argument may be silent on the impact of global financial meltdowns and domestic political turbulence, which bring about a break in the usual operations of liquidity transmission (Okoh et al., 2023). These theories are still applicable in the context of Nigeria's monetary policy, because some actions by the central bank, such as changes to the Cash Reserve Ratio (CRR) and the Monetary Policy Rate (MPR), have a clear effect on bank's liquidity and credit conditions (Alemu, 2023).

Monetary Policy Transmission Mechanism (MPTM)

This extends from the central bank's influence to the rest of the economy. It was formulated by economists like Bernanke and Gertler (1995), where it was suggested that modifications to the monetary policy, for example, the policy rate or reserve requirements, can result to changes in the liquidity of the bank through various ways, including the interest rate, credit, and asset price.

The interest rate channel analyses how a central bank's change in its policy rate has a direct bearing on the economy's cost of borrowing. Each of these interrelations affects the liquidity and lending patterns of banks. Looser policy rates increase liquidity within the banking sector because they reduce the cost of borrowing. The credit channel, however, claims that monetary policy has an effect on the net worth of individuals and businesses, which influences their access to credit and affects the liquidity of banks. The last channel is the asset price channel, which focuses on how interest rates impact the prices of various assets and, in turn, the value of collateral for loans, and hence bank liquidity (Afrogha & Tyohen, 2023).

A challenge to MPTM is the fact that it usually postulates the existence of a working banking system, which is not necessarily true for most developing countries like Nigeria, which face problems of liquidity management arising from non-performing loans and external shocks (Obizue et al., 2024). Still, the theory is useful in explaining the influence of monetary policy on liquidity in banks in Nigeria, especially with regard to the use of the policy instruments like the cash reserve requirement ratio (CRR) and the monetary policy rate (MPR) by the Central Bank of Nigeria (CBN) (Olawale & Akinola, 2023).

Empirical Review

Adekunle *et al* (2024) analyzed the interplay between the monetary policy rate, liquidity ratios, cash reserve ratios, and how these variables affected liquidity in Nigerian banks from 2013 to 2022. They showed that monetary policy has direct impacts on liquidity levels as putting tight measures in place to lower the funds available for lending. This complicates the banking sector's ability to foster economic growth during substantively tight periods. Joseph (2023) studied to what extent policy instruments like the liquidity ratio affect the financial stability of Nigerian deposit money banks. The results show that liquidity ratios are key the managers of banks' stability, and more so, during periods of monetary tightening, and greatly so, their degree of financial sufficiency.

IIwedi and James (2024) studied the effect of change of monetary policy on Nigerian deposit money banks and their profits and liquidity. Their conclusion was that tighter monetary policy, in particular, the raising of the cash reserve ratio will adversely affect a bank's profitability because of constrained liquidity on lending to other banks. Oladejo and Akinola (2023) examined the importance of the monetary policy rate in determining liquidity and profitability of banks in Nigeria. Adjustments made in the MPR have been noticed to have a direct linkage to the positions of liquidity that existing banks hold, impacting their ability to issue loans and also create liquidity in the markets. Otor and Yua (2025) analyzed the

impacts of the liquidity framework policies on specific banks in Nigeria and emphasized the importance of policies that ensure effective levels of liquidity. Results give the impression that shifting economic policies on average will result in banks needing to change how they mitigate liquidity risks.

3.0 METHODOLOGY

This study uses an ex post facto research design which is suitable for measuring the effect of monetary policy instruments on the liquidity of Deposit Money Banks (DMBs) in Nigeria. The time frame of the study is from the year 2007 to 2023, which covers a period of notable changes in monetary policies and banking sector reforms. Data were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin, while the Liquidity Ratio (LR) is a dependent on Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR), and the Currency in Circulation (CIC) as a proxy for Open Market Operations (OMPs) which are the independent variables. Further, the Ordinary Least Squares (OLS) method was applied in the study. Where:

$Y = \alpha_0 + \beta x + \mu_1$ ……Normal

$Y_t = \alpha_0 + \beta_t X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu_1$ ……*(1)*

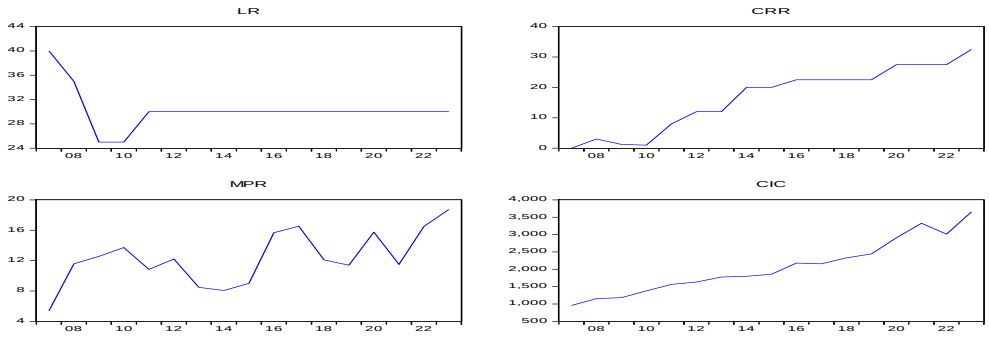
$LR_1 = \alpha_0 + \beta_t CRR + \beta_2 MPR + \beta_3 CIC + \mu_1$ ……*(2)*

Table 1: Descriptive Statistics on Monetary Policy and Deposit Money Bank Liquidity

	Liquidity Ratio	Cash Reserve Ratio	Monetary Policy Rate	Currency-In Circulation
Mean	30.29412	16.60294	12.35530	2077.021
Median	30.00000	20.00000	12.09473	1857.942
Maximum	40.00000	32.50000	18.75000	3653.304
Minimum	25.00000	0.000000	5.388008	955.8545
Std. Dev.	3.293264	10.68697	3.515535	786.3945
Skewness	1.301287	-0.345450	-0.052283	0.501776
Kurtosis	6.173944	1.744647	2.426710	2.287070
Jarque-Bera	11.93351	1.454390	0.240546	1.073399
Probability	0.002563	0.483263	0.886678	0.584675
Sum Sq. Dev.	173.5294	1827.382	197.7438	9894661.
Observations	17	17	17	17

Source: ***Author's Computation, 2025***

Figure 1: ***Monetary Policy and Deposit Money Bank Liquidity***



Source: E-view

Table 1 depicted descriptive analysis on Liquidity Ratio, Cash Reserve Ratio, Monetary Policy Rate and Currency in Circulation. Liquidity ratio exhibited a mean value of 30.29 and the median was 30.00 recording a standard deviation of 3.29 which suggests that there is moderate variability among the banks, but most do maintain some stability relative to each other, suggesting that there might be some responsiveness to policy changes, albeit slowly. With some banks appearing to have even tighter liquidity

ratios placed over these borrowing banks, this scenario is perhaps quite common as less cautious banks are likely to adopt less precautionary approaches during supposed phases of tight monetary policies. The kurtosis of 6.17 has suggested heavy tails indicating the presence of extreme value outliers where banks overly possess excess liquidity reserves. The positive skewness of 1.30 also seems to support this where it suggests large ratios are indeed present. Lastly, the positive skewness also indicates that a good proportion of the banks do sit around the median, albeit not too many. Further, Cash Reserve Ratio (CRR), exhibited a mean value of 16.60% and a median of 20.00%, the negative skew (-0.35) reveals that most observations are located at the higher value, but there are some outlier banks with lower ratios. This suggests that most banks have weaker liquidity positions and fewer banks have exceptionally low CRRs. The moderate kurtosis (1.74) tells us that although the CRR value is more concentrated around a central point, it is less likely to have outliers. The standard deviation of 10.69 implies that there is considerable variability, which is likely based on different compliance to regulatory liquidity options among the banks. In the case of the Monetary Policy Rate (MPR), with its average standing at 12.36% and near-zero skewness (-0.05), it can be inferred that most MPR values remain unchanged with almost no volatility. Its kurtosis, set at 2.43, is much like an apex, as much like the policy rate, it is also set consistently by the Central Bank of Nigeria. Its standard deviation, measuring variation, also yields 3.52 showing mild variation.

Table 2: Diagnostic Test (Unit Root)

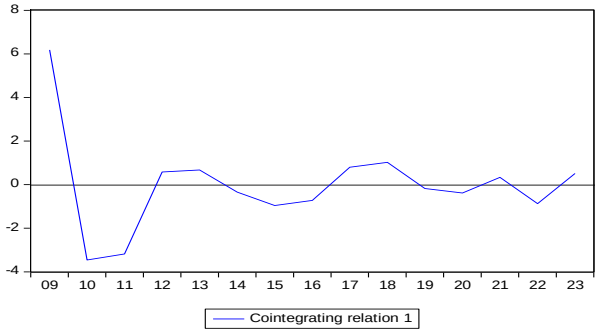
	At Level				At First difference			
Parameters	ADF test Statistic	Test critical value @ 5%	Prob.*	Order	ADF test statistic	Test critical value @ 5%	Prob.*	Order
Liquidity Ratio	-4.542436	-3.065585	0.0031	I(1)	-2.799514	-3.081002	0.0818	I(0)
Cash Reserve Ratio	-0.529187	-3.081002	0.8594	I(0)	-4.577045	-3.081002	0.0032	I(1)
Monetary Policy Rate	-2.626290	-3.065585	0.1083	I(0)	-4.620653	-3.081002	0.0030	I(1)
Currency-In Circulation	1.714611	-3.098896	0.9989	I(0)	-5.830251	-3.081002	0.0003	I(1)

Source: ***Author's Computation, 2025***

The results of the unit root tests show us the stationarity properties of the variables which is very important for constructing time series models. At levels, all variables except for the Liquidity Ratio are non-stationary because their ADF test statistics exceed the 5% critical value and they have high p-values (more than 0.05), indicating a unit root. More specifically, Liquidity Ratio is stationary at level with an ADF statistic of -4.542436 and a p-value of 0.0031 suggesting that it is integrated of order zero, I(0), while other variable: Cash Reserve Ratio, Monetary Policy Rate and Currency in Circulation are non-stationary at first difference with significant ADF statistics and p-values below .05 indicating that they are integrated of order one, I(1). So, the dataset contains a mix of I(0) and I(1) variables which is why models like ARDL that allow for such mixed integration orders can be potentially used.

Table 3: Co-integration test

Trace Statistics				**Maximum Eigen Value**		
Null Hypotheses	ADF test statistic	Test critical value @ 5%	Prob.*	Eigenvalue	Test critical value @ 5%	Prob.*
None *	116.6122	47.85613	0.0000	0.996520	27.58434	0.0000
At most 1 *	31.70017	29.79707	0.0298	0.772850	21.13162	0.0349
At most 2	9.467984	15.49471	0.3239	0.455971	14.26460	0.2754
At most 3	0.336704	3.841466	0.5617	0.022197	3.841466	0.5617



The results in Table 3 indicate that there is strong evidence of long-run equilibrium among the variables impacting the deposit money bank liquidity in the case of Nigeria. For instance, at the "None" level, the Trace statistic is 116.6122 which is much higher than the 5 percent critcal value of 47.85613 and has a p-value of 0.0000 which suggests that the null hypothesis of no cointegration is rejected. In a similar way, the Maximum Eigenvalue statistic is 99.6520 which is also greater than it's critcal value of 27.58434 and has a p-value of 0.0000. At the "At most 1" level, the Trace statistic is 31.70017 (critical value = 29.79707, p = 0.0298) and the Max-Eigen statistic is 24.81349 (critical value = 21.13162, p = 0.0349) again rejecting the null. Both tests do not reject the null hypotheses beyond this level. The outcome also suggests that there are exactly two cointegrating relations because the variables possess long-run forces that keep them from drifting apart which allows the use of an ECM model.

Table 4: Vector Error Correction Model (VECM)

Cointegrating Eq:	CointEq1			
LR(-1)	1.000000			
CRR(-1)	-0.062823			
	(0.01046)			
	[-6.00837]			
MPR(-1)	0.262532			
	(0.02085)			
	[12.5923]			
CIC(-1)	-0.000228			
	(0.00016)			
	[-1.39483]			
C	-31.40722			
Error Correction:	**D(LR)**	**D(CRR)**	**D(MPR)**	**D(CIC)**
CointEq1	-1.308355	-0.411426	0.137161	-27.06465
	(0.10841)	(0.39887)	(0.57449)	(28.9416)
	[-12.0687]	[-1.03148]	[0.23875]	[-0.93515]
D(LR(-1))	0.499330	0.563155	-0.006438	20.41252
	(0.07557)	(0.27805)	(0.40048)	(20.1752)
	[6.60733]	[2.02535]	[-0.01607]	[1.01176]
D(CRR(-1))	-0.133254	-0.388733	-0.218297	-11.17847
	(0.08190)	(0.30133)	(0.43400)	(21.8641)
	[-1.62706]	[-1.29006]	[-0.50299]	[-0.51127]
D(MPR(-1))	0.185906	0.035386	-0.184482	34.02144
	(0.06695)	(0.24632)	(0.35477)	(17.8727)
	[2.77691]	[0.14366]	[-0.52000]	[1.90355]
D(CIC(-1))	1.37E-05	-0.003521	-0.001374	-0.574335
	(0.00111)	(0.00408)	(0.00587)	(0.29589)
	[0.01232]	[-0.86331]	[-0.23392]	[-1.94102]
C	0.104260	3.511167	1.198846	254.1449

	(0.29060)	(1.06920)	(1.53997)	(77.5801)
	[0.35878]	[3.28391]	[0.77849]	[3.27590]
R-squared	0.958278	0.465635	0.076506	0.500233
Adj. R-squared	0.935100	0.168766	-0.436546	0.222584
Sum sq. resids	5.145682	69.65889	144.5033	366738.8
S.E. equation	0.756137	2.782063	4.006984	201.8632
F-statistic	41.34297	1.568486	0.149119	1.801675
Log likelihood	-13.25989	-32.80078	-38.27347	-97.06674
Akaike AIC	2.567985	5.173437	5.903129	13.74223
Schwarz SC	2.851205	5.456657	6.186349	14.02545
Mean dependent	-0.333333	1.966667	0.477928	166.5158
S.D. dependent	2.968084	3.051444	3.343165	228.9446

Determinant resid covariance (dof adj.)	157444.6
Determinant resid covariance	20404.82
Log likelihood	-159.5628
Akaike information criterion	25.00837
Schwarz criterion	26.33006

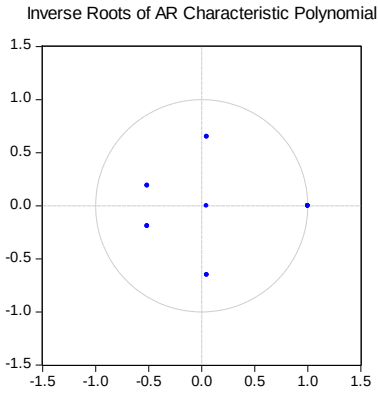
Source: ***Author's Computation, 2025***

Table 4, shows the relationships and discrepancies between monetary policy variables and liquidity of banks in Nigeria. The cointegrating equation shows that Cash Reserve Ratio decreases Liquidity Ratio as long-run negative effect significantly, while Monetary Policy Rate has strong positive long-run impact. Unit rise in CRR decreases LR by 0.063 and unit rise in MPR increases LR by 0.263 showcasing bank liquidity policy tools tightening or easing. In short term, the ECT for LR is -1.308355, highly significant t=-12.07 meaning long-run equilibrium deviations are corrected most definitely and fast at over 130% adjustment per period showing strong ability self-correcting mechanism in the system. D(LR) with high R-squared 0.96 provides strong explanatory power of the model concerning sustaining liquidity dynamics while having weaker power on other variables. Thus, most policy measures plausibly impact liquidity in a significant way, particularly in the long term, indicating swift disequilibrium correction.

Table 5: VEC Lag Exclusion Wald Tests

	D(LR)	D(CRR)	D(MPR)	D(CIC)	Joint
DLag 1	45.77280	5.589117	0.708797	8.883102	897.1697
	[2.75e-09]	[0.232006]	[0.950240]	[0.064089]	[0.000000]
df	4	4	4	4	16

Source: ***Author's Computation, 2025***



The VEC Lag Exclusion Wald Test determines the importance of lagged differences of the variables for the model in question. From the results, it can be concluded that lagged variables are statistically significant in explaining changes in the Liquidity Ratio (D(LR)), for which the Chi-square test statistic is 45.77 with the corresponding p-value of 2.75e-09 shows that it is significant at 1%. On the other hand, the p-values corresponding to D(CRR) (0.232), D(MPR) (0.950), and D(CIC) (0.064) indicate that indeed these lagged terms do not significantly explain their dependent variables. The joint test statistic is 897.17 with p-value of 0.000 which from the overall model shows strong significance alongside the lag structure relevance.

Table 6: Method: Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Cash Reserve Ratio	0.029450	0.204362	0.144108	0.8876
Monetary Policy Rate	-0.481717	0.297249	-1.620586	0.1291
Currency-In Circulation	0.000165	0.002992	0.055096	0.9569
C	35.41457	3.445369	10.27889	0.0000
R-squared	0.204968	Mean dependent var		30.29412
Adjusted R-squared	0.021499	S.D. dependent var		3.293264
S.E. of regression	3.257671	Akaike info criterion		5.402226
Sum squared resid	137.9615	Schwarz criterion		5.598277
Log likelihood	-41.91892	Hannan-Quinn criter.		5.421714
F-statistic	1.117180	Durbin-Watson stat		1.010549
Prob(F-statistic)	0.377835			

Source: ***Author's Computation, 2025***

The OLS regression evaluates the effect of monetary policy variables on the Liquidity Ratio (LR) using monetary policy variables. All of the p values relative to Cash Reserve Ratio, Monetary Policy Rate, and Currency-In Circulation impact LR in a statistically insignificant way through Cash Reserve Ratio (CRR) 0.8876, MPR (0.1291), and CIC (0.9569). Meanwhile, MPR having a negative coefficient of -0.4817 indicates some degree of weakening effect on liquidity, which is not statistically significant, however. LR is associated with a strong base level estimated by a significant constant term p value of 0.0000. Its value of R-squared is low 0.2049 indicates the model explains only 20 percent of variation in LR. Model indicative of lack of conclusive evidence, F prob value of 0.3778, Durbin Watson stat of 1.01 signals an autocorrelation issue - in this case likely positive autocorrelation.

$H0_1$: Cash Reserve Ratio has no significant impact on liquidity of deposit money banks in Nigeria

The regression result which indicated a high p-value of 0.8876, much greater than the 0.05 level, confirms the hypothesis that the Cash Reserve Ratio (CRR) exerts practically no significant impact on the liquidity of deposit money banks in Nigeria. This clearly points to the absence of significant impact and suggests that the liquidity of the banks is largely insulated from the changes in Cash Reserve Ratio during the period under analysis. Hence, at least in this, it could be posited that Cash Reserve Ratio has no significant impact on liquidity of deposit money banks in Nigeria.

$H0_2$: Monetary Policy Rate has no significant impact on liquidity of deposit money banks in Nigeria

The hypothesis which states that the Monetary Policy Rate (MPR) has no significant impact on liquidity of deposit money banks in Nigeria is supported by regression result, which shows that Monetary Policy Rate has a negative coefficient - 0.4817 and p value of 0.1291 which is greater than the 0.05 significance level. This implies that there is, indeed, an inverse relationship which indicates that MPR growing might constrict reducing bank liquidity, but that effect is statistically insignificant. Hence, within the period of study, it can be agreed that Monetary Policy Rate has no significant impact on liquidity of deposit money banks in Nigeria

$H0_3$: Open Market Operations has no significant impact on liquidity of deposit money banks in Nigeria
The hypothesis, Open Market Operations have no significant impact on liquidity of deposit money banks in Nigeria seems to be supported by the model where OMO is proxied by Currency in Circulation (CIC). The regression result indicates a very small statistically significant coefficient and p-value of 0.000165 and 0.9569 respectively, depicting no statistically significant impact. This indicates that Open Market Operations have no significant impact on liquidity of deposit money banks in Nigeria.

DISCUSSION OF RESULTS

Based on the analysis, the three variables reveal important insights regarding the liquidity management of Deposit Money Banks (DMBs) in Nigeria. The regression results indicate that all three instruments concurrently exert an insignificant effect on bank liquidity, which implies that conventional monetary policy instruments may not adequately operate within the Nigerian framework. These results may explain why the CRR has a coefficient larger than zero, specifically 0.02945, and p-value of 0.8876, suggesting minimal or no effect on liquidity. This confirms Olofin et al. (2024) findings, asserting that although the CRR can impact the profitability of banks, its direct effect on liquidity is negligible.
Also, Osho and Adelalu (2020) reported a negative significant relationship on the CRR and profitability that suggests indirect impact as a constraint on liquidity due to income reduction. MPR shows an inverse relationship with liquidity as evidenced by the analysis, which indicates a negative coefficient of -0.4817 and a p-value of 0.1291. Ndugbu and Okere (2015) argued that the monetary policy instruments, do not have a significant impact on bank performance and liquidity. This was further corroborated Obiaje and Umeokwobi (2024) who found no considerable relationship between commercial bank profitability in Nigeria and monetary policy instruments.
OMO and Currency-in-Circulation (CIC), liquidity relationship was also insignificant with a weak coefficient of 0.000165 and an exceedingly high p-value of 0.9569. Bassey et al. (2018) also remarked that although OMO has an impact on the money supply, it does little in increasing the liquidity of DMB. Okoh et al. (2024) stressed the point that excess liquidity can only be regulated by OMO in combination with other monetary measures. As Ahmed and Usman (2024) points out, there is a gap in the Nigerian monetary policy transmission mechanism which these results have highlighted. More so, deeper looks into non-conventional financial engineering tools for liquidity management would help in financial fortification. To add to this, Olofin et al. (2024) pointed out the Loan-to-Deposit Ratio (LDR) which has more substantial and direct bearing on liquidity and profitability.

4.0 CONCLUSION

In the findings, the study asserts that the traditional monetary policy tools, Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR), and Open Market Operations (OMO) do not have significant impacts on the Deposit Money Banks (DMBs) liquidity in Nigeria. The research demonstrates that none of these instruments have a statistically valid impact for bank liquidity during the study period. This indicates a weak transmission mechanism of monetary policy, and inefficient use of these tools, or failure of banks to respond to them. The lack of relevance for CRR and MPR indicates that banks' liquidity position can be hardly affected by alterations in reserve requirements and benchmark interest rates on a short-term basis. Moreover, using Currency-in-Circulation as an indicator for OMO reflects the minimal effects that changing the volume of liquidity supplied into the banking system have on domestic DMBs operations. Thus, the lack of sufficient liquidity support or stimulation of the economy makes it difficult to effectively implement the monetary policy. Therefore, the study suggests to rethink Nigeria's monetary policy system and recommends adopting a more holistic view that incorporates market-based strategies alongside structural ones geared towards improving liquidity control.

RECOMMENDATIONS

Based on the conclusion, the following are recommended:

1. The Central Bank of Nigeria (CBN) needs to work on their transmission mechanisms effectivity by ensuring that policies like the CRR and APR adjustments are more directly and quickly adopted by financial institutions and market rates to yield changes.
2. the CBN should utilize market-oriented approaches such as flexible open market operations, repurchase agreements and standing facilities to control the liquidity of the banking system more effectively
3. The CRR level should be reviewed on a rotational basis to find a balance between confronting liquidity risk and making sure bank lending is not over constrained. Implementing a tiered CRR approach should achieve the purpose of measuring effects on certain banks without undermining liquidity in the system.
4. A change in OMO approach planning is necessary to hit desired levels of liquidity in deposit money banks. This involves type and change rate, bank coherency, and further targeting fiscal and monetary broad objectives.
5. By deepening the financial markets in Nigeria, the speed at which liquidity responds to changes is likely to increase. This will bolster the effective control of the liquidity by reinforcing the capital and interbank markets and accepting other financial instruments.
6. The regulators need to motivate DMBs into adopting stronger internal frameworks for liquidity management in order to maintain adequate liquidity ratios, apply predictive models to stress tests, and ensure funding from sources other than the interbank market.

Contribution to Knowledge

The findings of this study add to the existing literature by validating the inadequacy of traditional monetary policy tools: Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR), and Open Market Operations (OMO) on the liquidity level of Deposit Money Banks (DMBs) in Nigeria. It also advances the literature by describing the relatively weak policy transmission mechanism in Nigeria's context, even though the conventional wisdom contests the presence of strong links between these policies and liquidity levels. Calling Currency-in-Circulation (CIC) as a surrogate for OMO is also illuminating since it demonstrates how little impact it has on short-term liquidity. The application of unit root test, cointegration test, and the use of Vector Error Correction Model (VECM) to develop long-run and short-run relationships in the context of developing economies is relatively new in the literature and adds great value to the study's methodological approach. These arguments need to be considered by policymakers, financial market regulators, and scholars who wish to formulate more efficient and market-driven monetary policies for economies with comparable structures.

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