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EFFECT OF CASH RESERVE RATIO AND LIQUIDITY RATIO ON BANK LENDING TO THE PRIVATE SECTOR IN NIGERIA

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ABSTRACT

The study examines the effect of Cash reserve ratio and liquidity ratioon bank lending in Nigeria from 2008 to 2024. The dependent variable was proxied by credit to private sector, while the independent variable was proxied by cash reserve ratio and liquidity ratio. Using Ex post facto research design, quarterly time series data were extracted from the Central Bank of Nigeria's statistical bulletin 2024 and VAR estimation test was used based on the unit root test result. With a long run cointegration significant effect, the VAR result showed that cash reserve ratiohad a negative significant effect on credit to private sector in Nigeria, while liquidity ratio had insignificant effect on credit to private sector in Nigeria. The study recommends that since CBN should reduce CRR ratio of 50% because this has imposed excessive constraints on lending. Complementary measures, such as targeted credit facilities or sector-specific incentives, can also help mitigate the contractionary impact on productive sectors.CBN could also introduce more flexible liquidity requirements or develop dynamic liquidity frameworks that respond to banking sector conditions to promote credit expansion.

KEYWORDS: - Cash reserve ratio, Liquidity ratio, Bank lending, Credit to Private Sector, Nigeria.

JEL Classification: · E52, E58, C01, C32, O16

1.0 INTRODUCTION

In developing economies, monetary policy is further complicated by high inflation rates, exchange rate volatility, and underdeveloped financial markets. For instance, in many African economies, central banks struggle to balance the competing objectives of curbing inflation, supporting economic growth, and ensuring financial stability. Kaminsky and Reinhart (2023)

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suggested that tight monetary policies, while effective in controlling inflation, can lead to higher loan defaults and increased non-performing loans (NPLs), ultimately undermining the banking system. In 2024, the CBN has implemented several monetary policy measures to address economic challenges. Notably, in November 2024, the CBN raised its benchmark lending rate by 50 basis points to 27.50%, marking the fifth-rate hike of the year (March-24.74%, May-26.25%, July-26.75%, September-27.25%, November-27.50%), in an effort to combat persistent inflation. Such policy adjustments have direct implications for bank lending rates and the availability of credit to the private sector. Additionally, in October 2024, the CBN signed an agreement with the International Finance Corporation (IFC) to expand local currency financing for Nigerian businesses. This partnership aims to reduce foreign exchange risks and enhance the availability of naira-denominated credit to the private sector, thereby supporting economic growth.

Bank lending to the private sector encompasses loans and advances provided by commercial banks to businesses and individuals for investment and consumption purposes. This lending is crucial for economic growth, as it finances capital formation, enhances productive capacity, and supports consumer spending. The availability and cost of credit are significantly influenced by the central bank's monetary policy stance. Gbanador and Giami (2024) indicate that Nigeria's credit to the private sector has been increasing. For example, in July 2024, net domestic credit to the private sector surged by 33% year-on-year, reaching NGN 75.4 trillion. This growth occurred despite the CBN's tightened monetary policy stance, suggesting that factors beyond traditional monetary policy tools are influencing credit expansion.

Thus, the Central Bank of Nigeria (CBN) keeps employing various monetary policy instruments which include cash reserve ratio and liquidity ratio, to influence credit to the private sector. (CBN, 2024).The cash reserve ratio has a direct impact on the level of liquidity in the country's economy and it is a money supply valve that the central bank holds to control inflation. The CRR is a crucial monetary policy tool and is used for controlling money supply in an economy. The reduction in the cash reserve ratio releases liquidity thus enhancing the capacity of DMBs to expand credit. The cash reserve ratio (CRR) in Nigeria has experienced fluctuations during the period from 2007 to 2022. The CRR was 22.5% in 2017. The highest CRR recorded during this period was 50% in 2024, while the lowest was 2% in 2008. 2024, the cash reserve ratio (CRR) in Nigeria is set at 32.5%. This rate has been increasing since the beginning of 2024, with the average rate for the period between 2008 and 2023 being approximately 35% (CBN, 2024). The CRR has been a significant factor in maintaining banking stability and hence increased profitability and lead to improved performance. Any increase in the cash reserve ratio by CBN will tighten DMBs' liquidity and could also dampen demand-driven inflationary pressures and consequently affect the bank lending (Ananwude, et al. 2017).

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Also, liquidity ratio affects the credibility of the bank as well as the credit rating of the other companies. If there are continuous defaults in repayment of a short-term liability, this will lead to bankruptcy. According to CBN (2024), liquidity ratio increased slightly from 2005 to 2007. It exhibited a downward trend from 2008-2009 and rose steadily between 2009 and 2011. It witnessed a decrease in 2014, when it was at 38.3%, after which it continued to rise steadily. The bank's liquidity position was above the required minimum of 30% for DMBs. The CBN did retain the liquidity ratio at 30.0% in July 2022. Liquidity ratio is a monetary policy tool used by the CBN to regulate the money supply and control inflation. Hence it plays an important role in the financial stability of any company and credit ratings. A good liquidity is anything greater than 1. It indicates that the bank is in good financial health and is less likely to face financial hardships. The higher the ratio, the higher the safety margin the business possesses to meet its current liabilities (Abomaye-Nimenibo, 2021).

Monetary policy is pivotal in shaping economic outcomes, particularly through its influence on credit allocation to the private sector. In Nigeria, the Central Bank of Nigeria (CBN) employs various instruments to regulate credit flows. Despite these measures, challenges persist in effectively channeling credit to the private sector, which is essential for economic growth and development. Recent data from CBN (2024) indicates a significant increase in private sector credit. In July 2024, net domestic credit to the private sector surged by 33% year-on-year, reaching NGN 75.4 trillion, up from NGN 56.46 trillion in July 2023. This growth occurred despite the CBN's tightened monetary policy stance, but in the first quarter of 2024, the NPL ratio increased to 5.1%, marginally surpassing the prudential benchmark of 5.0%.In response to the rising NPLs, Nigerian banks significantly increased their provisions for loan losses. For instance, in the first quarter of 2024, eight banks collectively raised their provisions to N247.91 billion, a substantial increase from N45.13 billion in the same period of 2023 which has continued to reduce their performance.

The theoretical gap identifies areas where existing theories do not fully explain the relationship between monetary policy and bank lending in the Nigerian context. Although, the theory of the credit channel of monetary policy transmission explains how interest rates influence lending and stability, they may not fully capture the complexities of Nigeria's banking sector, such as regulatory inefficiencies or external shocks. It is against this background this study examines the effect of Cash reserve ratio and Liquidity ratioon bank lending to private sector in Nigeria from 2008-2023. The null hypotheses of this research are stated below:

H_{01}: Cash reserve ratio has no significant effect on bank lending to private sector in Nigeria.
H_{02}: Liquidity ratios have no significant effect on bank lending to private sector in Nigeria.

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2.0 LITERATURE REVIEW

2.1 Concept of Bank Lending

Bank lending practices in the world can be traced to the period of industrial revolution which increased the pace of commercial and production activities thereby bringing about the need for large capital outlays for projects. Many captains of industry at that period were unable to meet up with the sudden upturn in the financial requirements and therefore turned to the banks for assistance (Modugu&Dempere, 2021). However, Timsina (2017) described bank lending as the aggregate amount of funds provided by commercial banks to individuals, business organizations and government. Hence, this study operationally defines bank credit as a promise by a customer (debtor) to pay a bank (lender) the money borrowed. The credit includes DMBs' credits to governments, core private sectors, other private sectors and individuals.

2.2 Concept of Cash Reserve Ratio

Cash reserve ratio is the proportion of total deposit liabilities which the deposit money banks are expected to keep as cash with the Central Bank of Nigeria. Reserve requirement is one of the most powerful instruments of monetary control, if it changes, the required reserve ratio will have another effect. A change in the required reserve ratio changes the ratio by which the banking system will expand deposits through the multiplier effect. If the required reserve ratio increases, it thereby reduces the liquidity position of the banking system (Udeh, 2015).

2.3 Concept of Liquidity Ratio

Liquidity ratio is the proportion of total deposits to be kept in specified liquid assets mainly to safeguard the ability of the banks to meet depositors' cash withdrawals and ensure confidence in the banking system (Olweny&Chiluwe, 2012). It is generally accepted that liquidity ratio is used to increase or decrease cash availability of commercial banks. Liquidity ratio is a financial metric used to assess a company's ability to meet its short-term obligations using its most liquid assets. This ratio is crucial for investors, creditors, and management to gauge the financial health of a business and its capacity to handle immediate financial challenges (Otalu et al., 2014).

3.0 EMPIRICAL REVIEW

3.1 Cash Reserve Ratio and Bank Lending

Didigu et al (2022) investigated the impact of cash reserve ratio on banking sector stability in Nigeria. Data for this study were obtained from secondary sources such as Statistical Bulletins, Annual Reports and Statement of Accounts, and Financial Stability Reports of the CBN and were collected on quarterly basis from 2007Q1 to 2021Q4. The study employs the autoregressive distributed lag (ARDL) bounds testing approach to cointegration. Results showed that a long run relationship exists between banking sector stability and cash reserve ratio in Nigeria. The study recommends, among others, that cash reserve and liquidity ratios should be kept at levels that

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will prevent excess liquidity in the system. However, the study did not justify the scope of the study.

Akinleye and Oluwadare (2022) examined the effect of cash reserve requirement on banks' profitability in Nigeria for a period of 10 years, spanning from 2010-2019. The study covered all the listed Deposit Money Banks (DMBs) in Nigeria among which, 8 listed banks designated as Systematically Important Banks (SIBs) by Central Bank of Nigeria (CBN) were purposively selected. Secondary data obtained from the audited annual financial statement, CBN Annual reports and account of DMBs of the selected listed SIBs were used. Panel regression of fixed and random effect estimation was employed and this was carried out after descriptive statistics and Pearson correlation have been done. It was discovered that cash reserve ratio exerts a negative and significant effect on return on assets of Deposit Money Banks (DMBs) in Nigeria and that cash reserve ratio has a negative and significant effect on return on equity. The study established that the effect of cash reserve requirement on banks' profitability is statistically significant. Thus, the study time-frame stopped at 2019, likewise the study was conducted in 2022.

Osakwe et al (2019) examined the effect of monetary policy instruments on banking sector credits in Nigeria. The researcher employed three price-based monetary policy tools including monetary policy rate, cash reserve ratio, Treasury bill rate while liquidity ratio was also introduced as a control variable. Data analyses involved Augmented Dicker-Fuller (ADF) unit roots test, Johansson co-integration test, Vector Error Correction model and Impulse Response Function (IRF). The Co- integration result showed that there is long run relationship between monetary policy tools and bank credit such that MPR and LIQ has significant positive long run effects while TBR and CRR had significant negative long run effects on bank credit in Nigeria. The Vector Error Correction Mechanism (ECM) showed that monetary policy in Nigeria is a reliable short -term mechanism for controlling the banks in Nigeria vis -à-vis financial intermediation functions. The impulse response function has shown that all the monetary policy variables (MPR, CRR, TBR and LIQ) have negative effects on bank propensity to grant credit in Nigeria. The study generally recommends that price-based monetary policy tools should be used in short term regulation stance of the government. However, after conducting Co-integration and Vector Error Correction model, the study failed to conduct a Wald Test to examined the individual result hypothesis of the study.

In a study from Kenya, Maigua and Muoni (2016) employed cash reserve requirement, inflation rates, discount rates, and exchange rate to determine the influence of monetary policy on credit of banks. Multiple regression technique was employed on a sample of 26 out of 43 commercial banks operating in Kenya. The result revealed that cash reserve requirement ratio had negative influence on bank credit. Thus, the study posited that higher levels of reserve requirement ratio

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result in lower bank credit in Kenya. However, the study focused in Kenya while this study will focus in Nigeria, of which the variable impact or results may be different.

3.2 Liquidity Ratio and Bank Lending

Casu et al (2024) investigates the effect of the introduction of the net stable funding ratio (NSFR) on South African domestic banks' lending. The study decomposed total lending by customer type (corporate vs household) and by loan categories (instalments, mortgages, credit cards, overdrafts and other loans) to account for different risk profiles and maturities (short-, medium- and long-term lending). The results showed that NSFR regulations in South Africa are largely compliant with Basel III standards. While total lending does not appear to have been affected, the results indicated that the introduction of the NSFR has influenced loan composition and maturity profiles. We find that South African banks have increased the proportion of short-term lending in their loan portfolios, decreasing long-term lending, especially in residential mortgages. This effect aligns with the NSFR's aim to reduce maturity transformation but could nonetheless impact households' ability to obtain long-term credit. However, the study focused in South African domestic banks while this study will focus in Nigeria, which the variable impact or results may be different.

Okwor et al (2022) examined the impact of liquidity ratio on credit to the private sector in Nigeria. The study applied an auto-regressive distributed lag model (ARDL) for analysis of the data covering the period of 1981 to 2021. Data for the study were collected from the Central Bank of Nigeria (CBN) statistical bulletin. Liquidity ratio (LIQ) had a positive but statistically non-significant impact on credit to the private sector. The study recommends that the government needs to benchmark best practices in monetary policy development from those economies that are more advanced in order to develop better monetary control policies that can improve the performance of the banking industry for rapid economic growth and development. However, the study did not conduct auto-regressive bound test before conducting the ARDL test, in order to have a robust result.

Ofonime et al (2022) examine the influence of bank liquidity on the lending behaviour of Commercial Banks in Nigeria. Twelve (12) listed Commercial Banks were selected using the purposive sampling technique. The ex post facto research design was adopted and secondary data drawn from the sampled Commercial Banks from 2006 to 2020 were used for analysis. The data were analyzed using descriptive statistics and regression analysis. The results revealed that bank liquidity significantly influenced the lending behaviour of Commercial Banks. However, the loan-to-total assets ratio was found to exert the highest relative influence on the lending behaviour of Commercial Banks. It was recommended, among others, that Commercial Banks should prioritize the maintenance of a dynamic loan-to-total assets ratio. Also, the Central Bank

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of Nigeria and other regulatory bodies should be more proactive in ensuring Commercial Banks' liquidity and sustainability. However, the study used aggregate annual data, likewise this study will use quarterly data.

4.0 THEORETICAL REVIEW

4.1 The Keynesian Theory of Monetary Policy

The theory was proposed by Keynes in 1930. The theory states that monetary policy works primarily through interest rate as suggested by Keynesian Economist affects bank lending. Also, an increase in the money supply leads to a fall in interest rate to include the public to hold additional money balances as suggested by Keynesian transmission mechanism. Consequently, a drop-in interest rate level may stimulate investment. Through the multiplier, the increased investments also increase the level of income or output, which may stimulate economic activities. Interest rates and investment are affected by monetary policy, indirectly through economic activity. A highly detailed sector building up of aggregate demand and a detailed specification of portfolio adjustment process which is characterized by the Keynesian transmission mechanism which attaches key role to interest as an indirect linkage between fiscal demand and monetary policy (Krishnamurthy &Vissing-Jorgensen,2015). The monetary mechanism of Keynesians stresses on the role of money in simple terms, but involves an indirect link of money with total demand through the interest rate as representatively shown below: OMO, RMS, GNP Where, OMO = Open Market Operation R = Commercial Bank Reserve MS = Stock of Money r = Interest Rate I = Investment GNP = Gross National Product. On a more analytical note, if the economy is initially at equilibrium and there is open market purchase of government securities by the Central Bank of Nigeria (CBN), this Open Market Operation (OMO) will increase the commercial banks reserve (R) and raise the bank reserves.

The theory also provides interest rate as a determinant of demand and supply of money, hence, the theory indicated that money supply is usually determined by monetary authority which is the central bank; while, the demand for money is a function of income and interest rate. The theory further explains that transactionary and precautionary motives of liquidity preference depends on income, whereas, speculative motive depends on interest rate. Thus, the Keynesian theory implies that low interest rate as a component of cost administered is detrimental to increasing savings; and, hence investment demand. The work of Aliyu and Daida (2018) revealed that the proponents of this theory argued that increase in the real interest rate will have strong positive effect on savings which can be utilized in investment; because, those with excess liquidity will be encouraged to save subject to favourable interest rate. Therefore, banks will have excess money to lend to investors for investment purposes thereby raising the volume of productive investment and increasing their profitability. This theory introduced the concept of liquidity trap,

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a situation where low interest rate discourages savings and consequently reduces investments due to lack of investable fund (Bellowa&Amelant, 2017).

4.2 Shift ability Theory

The theory was propounded by Suviranta Br in 1967. The theory states that a bank's liquidity is adequately maintained if it holds asset that could be shifted or sold to other lenders or investors for cash even during period of crisis or distress. The shift ability theory focuses on the liability side of the balance sheet. The theory contends that supplementary liquidity could be derived from the liabilities of a bank; therefore, shift ability, marketability or transferability of a bank's assets is a basis for ensuring liquidity. The theory further contends that highly marketable security held by a bank is an excellent source of liquidity. The proponents of this view argued that a bank's liquidity could be enhanced if it holds specified liquid assets required selling to the Central Bank and the discount Market (interbank window) provided they are ready to purchase the asset offered at discount.

According to Nwankwo (2020) argued that since banks can buy all the funds they need, there is no need to store liquidity on the asset side (liquidity asset) of the balance sheet. It pertinent to note that liquidity management theories have been subjected to critical review by various scholars. The general consensus however is that during period of distress or crisis, banks with grave financial conditions and downgraded status may be challenged in obtaining the desired liquidity because the investors/deposits confidence in them has been eroded. This is however not the case with healthy or financially sound banks, which liabilities (deposits, market funds and other creditors) constitute a major component of their liquidity sources as their liquidity strain may be less severe.

5.0 METHODOLOGY

The research design employed in this research work is *Ex post facto* research design. The study employed monthly data from the Central bank of Nigeria Statistical bulletin (2024) from 2008 to 2024. Due to time series data, the technique adopted in this research requires the use of empirical analysis, descriptive statistics, unit root test, and vector autoregressive (VAR) because it recognizes that different factors not just one can affect or establish the effect of monetary policy on bank lending to private sector. The following model was estimated.

Let $Y_t = (CPS_t, CRR_t, LQR_t)'$. A VAR of order p is specified as:

$$Y_t = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + \ldots + A_p Y_{t-p} + \varepsilon_t$$

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where A_0 is a vector of intercepts, A_i are coefficient matrices, and ε_t is a vector of white-noise error terms.

$$CPS_t = \alpha_{10} + \Sigma_{i=1}^{p} \alpha_{11i} CPS_{t-i} + \Sigma_{i=1}^{p} \alpha_{12i} CRR_{t-i} + \Sigma_{i=1}^{p} \alpha_{13i} LQR_{t-i} + \varepsilon_{1t}$$

$$CRR_t = \alpha_{20} + \Sigma_{i=1}^{p} \alpha_{21i} CPS_{t-i} + \Sigma_{i=1}^{p} \alpha_{22i} CRR_{t-i} + \Sigma_{i=1}^{p} \alpha_{23i} LQR_{t-i} + \varepsilon_{2t}$$

$$LQR_t = \alpha_{30} + \Sigma_{i=1}^{p} \alpha_{31i} CPS_{t-i} + \Sigma_{i=1}^{p} \alpha_{32i} CRR_{t-i} + \Sigma_{i=1}^{p} \alpha_{33i} LQR_{t-i} + \varepsilon_{3t}$$

CPS = Credit to private sector
CRR = Cash reserve ratio
LQR = Liquidity ratio
a = intercept (value of Y when Xj is zero)
e = Error term

Table 1: Variables, Measurement

S/N	Variable	Nature	Measurement	Supporting Sources
1.	Bank Lending	Dependent variable	Measured the performance of banks with total credit or loans to the private sectors	Modugu and Dempere (2021)
2	Cash reserve ratio	Independent variable	Measured as average deposit liabilities which the deposit money banks and other financial institutions are expected to keep as cash with the Central Bank of Nigeria	Bawa et al. (2018)
3	Liquidity Ratio	Independent variable	Measured as average deposits to be kept in specified liquid assets mainly to safeguard the ability of the banks to meet depositors' cash withdrawals and ensure confidence in the banking system.	Olweny and Chiluwe (2012).

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6.0 RESULTS AND DISCUSSIONS

In this section, the results of the study are presented and discussed with reference to the aim of the study, which was to determine the influence of using time series data of the effect of monetary policy on bank lending to private sector.

Table 2: Descriptive Statistics

	LOG_CPS_	LOG_CRR_	LOG_LQR_
Mean	7.160682	1.125576	1.475239
Median	7.179940	1.301030	1.477121
Maximum	7.772446	1.698970	1.602060
Minimum	6.741225	0.096910	1.397940
Std. Dev.	0.257626	0.464169	0.040485
Skewness	0.662563	-1.245341	0.352017
Kurtosis	2.782428	3.376866	5.361955
Jarque-Bera	5.109335	17.97899	17.21108
Probability	0.077718	0.000125	0.000183
Sum	486.9264	76.53918	100.3162
Sum Sq. Dev.	4.446883	14.43535	0.109815
Observations	68	68	68

Source: E-Views 13, 2025.

The descriptive statistics for credit to the private sector (LOG_CPS) show that the mean and median values are very close, suggesting that the distribution of private sector credit is relatively symmetric over the study period. With a standard deviation of 0.26, the series exhibits low variability, implying that credit to the private sector grew in a stable and predictable manner. The positive skewness indicates that higher credit values appear more frequently, while the kurtosis value below 3 suggests a relatively flatter distribution with mild outliers. Importantly, the Jarque–Bera test is not significant at the 5% level, meaning that LOG_CPS is approximately normally distributed. This stability and near-normality make the series suitable for econometric modelling and support the reliability of statistical inference.

In contrast, the cash reserve ratio (LOG_CRR) displays a different pattern. The relatively large gap between the mean and median, combined with a wider range and a standard deviation of 0.46, shows that CRR experienced substantial variation over the years. The strong negative skewness indicates that lower CRR values occurred more frequently, with occasional policy spikes creating higher CRR observations. With a kurtosis value slightly above 3, the distribution is somewhat peaked, reflecting the presence of a few extreme values. The Jarque–Bera p-value is highly significant, indicating that LOG_CRR is not normally distributed.

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The liquidity ratio (LOG_LQR) exhibits very narrow dispersion, as seen in its extremely small standard deviation of 0.04 and the tight range between its minimum and maximum values. This suggests that the CBN maintained a very stable liquidity ratio policy throughout the study period. Although the variable has a slight positive skewness and a kurtosis well above 3—indicating clustering around the mean with a few extreme observations, the overall distribution still reflects strong policy consistency. Despite its Jarque–Bera p-value indicating non-normality, the stability of the liquidity ratio reduces concerns about structural distortion in the financial system.

Therefore, the descriptive statistics reveal that credit to the private sector is stable and approximately normally distributed, while the monetary policy variables (CRR and LQR) show different patterns of policy behavior. CRR is volatile and non-normal, reflecting frequent adjustments by the CBN, whereas LQR is extremely stable but also non-normal due to its clustered nature. These patterns provide important insights into how monetary policy instruments behave in Nigeria and help guide the choice of econometric techniques for further analysis.

Table 3: Correlation Matrix

	LOG_CPS	LOG_CRR	LOG_LQR
LOG_CPS	1	0.750674	0.00473
LOG_CRR	0.75067	1	0.01768
LOG_LQR	0.00473	0.01768	1

Source: E-Views 13, 2025.

The correlation results reveal a strong and positive relationship between credit to the private sector (LOG_CPS) and the cash reserve ratio (LOG_CRR), with a correlation coefficient of approximately 0.75. This indicates that increases in CRR are associated with increases in credit to the private sector, which is somewhat counterintuitive because higher CRR is generally expected to reduce banks' lending capacity. In contrast, the relationship between LOG_CPS and the liquidity ratio (LOG_LQR) is extremely weak, with a correlation coefficient close to zero (0.0047).

Similarly, the correlation between LOG_CRR and LOG_LQR is also very weak (0.0177), indicating virtually no linear association between the two monetary policy instruments. This reinforces the view that CRR changes were used actively and independently by the CBN as a short-term stabilization tool, while the liquidity ratio remained relatively constant as a long-term regulatory requirement. Therefore, the correlation matrix shows that while CRR has a surprisingly strong positive association with private sector credit, the liquidity ratio exhibits no meaningful correlation with either CPS or CRR. These results suggest that monetary policy instruments in Nigeria influence credit dynamics differently, and further econometric analysis

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such as model would be essential to understand the direction and magnitude of these effects in the long run and short run.

Table 4: Summary of Unit Root Test

Variables	Phillips-Perron Adj. T-Statistic	Prob. Values	Order of Integration
CPS	-6.070861	0.0000	I(1)
CRR	-8.147211	0.0000	I(1)
LQR	-4.788891	0.0002	I(1)

Source: Researcher's Computation using E-view 13, 2025

The Phillips–Perron unit root test results indicate that CPS (Credit to the Private Sector) is stationary at first difference, I(1), as shown by the highly significant adjusted t-statistic of –6.070861 with a p-value of 0.0000. This implies that CPS is non-stationary in its level form but becomes stationary after differencing once. In economic terms, the behaviour of credit to the private sector exhibits a trending pattern over time, likely reflecting structural growth in the Nigerian financial system, but stabilizes once its long-term trend is removed. This confirms that CPS is integrated of order one and suitable for models that accommodate mixed levels of integration, such as VAR.

The CRR (Cash Reserve Ratio) also becomes stationary at first difference, with an adjusted t-statistic of –8.147211 and a p-value of 0.0000, indicating I(1). This means that CRR shows significant persistence over time and does not revert to a mean in its level form, consistent with Nigeria's monetary policy practice where CRR adjustments are infrequent but substantial. Once differenced, however, the series becomes stable, implying that short-run changes in CRR contain meaningful information for modelling monetary policy effects. The I(1) nature of CRR supports its inclusion alongside other non-stationary variables in long-run equilibrium modelling.

On the other hand, LQR (Liquidity ratio) is stationary at level, I(1), as evidenced by its adjusted t-statistic of –4.788891 and a p-value of 0.0002, which is significant at the 1% level. This indicates that LQR fluctuates around a stable mean and does not require differencing to achieve stationarity.

Therefore, these results reveal the first difference order of integration among the variables: CPS and CRR are I(1), while LQR is I(1). This justifies the use of the VAR (Vector Autoregressive) approach, which is designed for variables integrated of different orders (as long as none is I(2)). Therefore, the data structure supports robust long-run and short-run analysis to examine how monetary policy instruments influence credit to the private sector in Nigeria.

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Table 5: Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.473529	58.96244	29.79707	0.0000
At most 1 *	0.201778	17.26106	15.49471	0.0268
At most 2	0.039390	2.612120	3.841465	0.1060

Source: Researcher's Computation using E-view 13, 2025

The Johansen cointegration tests were employed to examine the long-run relationship between credit to the private sector (LOG_CPS) and key monetary policy instruments are cash reserve ratio (LOG_CRR) and liquidity ratio (LOG_LQR) in Nigeria over the period 2008Q4 to 2024Q4. Both the Trace and Maximum Eigen value statistics provide consistent evidence of the existence of two cointegrating equations at the 5 per cent level of significance, indicating a stable long-run equilibrium relationship among the variables. This finding implies that credit to the private sector and monetary policy instruments move together in the long run, despite possible short-run deviations.

The normalized cointegrating vector for the first cointegrating equation shows that LOG_CRR carries a negative coefficient, while LOG_LQR exhibits a positive coefficient in relation to LOG_CPS. Economically, this suggests that an increase in the cash reserve ratio reflecting a tightening of monetary policy tends to reduce credit to the private sector in the long run. This outcome is consistent with monetary transmission theory, as higher reserve requirements constrain banks' lendable funds. Conversely, the positive long-run association between liquidity ratio and private sector credit indicates that improved banking sector liquidity conditions enhance banks' capacity to extend credit, thereby supporting private sector activity.

The adjustment (alpha) coefficients provide insights into the speed and direction of adjustment toward long-run equilibrium following short-run shocks. The adjustment coefficient for D(LOG_CPS) is positive but relatively small, indicating that credit to the private sector adjusts slowly to restore equilibrium when disequilibrium occurs. In contrast, the adjustment coefficients for D(LOG_CRR) and D(LOG_LQR) are negative and statistically meaningful, suggesting that monetary policy variables play a more active role in correcting deviations from long-run equilibrium. This implies that monetary authorities, through adjustments in reserve and liquidity

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requirements, significantly influence the path through which equilibrium in private sector credit is restored.

The second cointegrating equation further reinforces the existence of long-run interactions among the variables, although the magnitude and signs of the coefficients suggest that the relationships are complex and potentially asymmetric. Overall, the presence of multiple cointegrating relationships highlights the structural and persistent link between monetary policy stance and credit allocation to the private sector in Nigeria.

In summary, the results provide strong empirical support for the view that monetary policy instruments particularly the cash reserve ratio and liquidity ratio are crucial determinants of private sector credit in Nigeria over the long run. While liquidity-enhancing policies support credit expansion, restrictive measures such as higher reserve requirements dampen credit supply. These findings underscore the importance of a carefully calibrated monetary policy framework that balances financial stability objectives with the need to promote credit-driven economic growth.

Table 6: Vector Auto regression

	LOG_CPS_	LOG_CRR_	LOG_LQR_
LOG_CPS_(-1)	1.168439	-1.165847	0.273472
	(0.13187)	(0.61783)	(0.17076)
	[8.86084]	[-1.88700]	[1.60149]
LOG_CPS_(-2)	-0.158481	1.314463	-0.305328
	(0.13553)	(0.63500)	(0.17551)
	[-1.16934]	[2.07001]	[-1.73969]
LOG_CRR_(-1)	-0.008806	0.823022	-0.068288
	(0.02569)	(0.12036)	(0.03327)
	[-0.34277]	[6.83784]	[-2.05274]
LOG_CRR_(-2)	0.014808	0.093488	0.089937
	(0.02547)	(0.11935)	(0.03299)
	[0.58130]	[0.78328]	[2.72634]
LOG_LQR_(-1)	0.200052	-0.105769	0.459097

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	(0.09601)	(0.44985)	(0.12433)
	[2.08361]	[-0.23512]	[3.69249]
LOG_LQR_(-2)	-0.060769	-0.922334	-0.024283
	(0.09291)	(0.43531)	(0.12031)
	[-0.65407]	[-2.11880]	[-0.20183]
C	-0.270664	0.587437	1.032254
	(0.18626)	(0.87267)	(0.24120)
	[-1.45318]	[0.67315]	[4.27975]
R-squared	0.992967	0.952944	0.448328
Adj. R-squared	0.992252	0.948158	0.392226
Sum sq. resids	0.029086	0.638501	0.048775
S.E. equation	0.022203	0.104029	0.028752
F-statistic	1388.312	199.1363	7.991267
Log likelihood	161.3462	59.41353	144.2862
Akaike AIC	-4.677158	-1.588289	-4.160187
Schwarz SC	-4.444921	-1.356053	-3.927951
Mean dependent	7.172422	1.145226	1.472274
S.D. dependent	0.252238	0.456894	0.036881

Source: E-View 13 Output, 2025

Interactions among credit to the private sector (LOG_CPS), the cash reserve ratio (LOG_CRR), and the liquidity ratio (LOG_LQR) in Nigeria over the period 2008Q3–2024Q4, using two lags. The results provide important insights into persistence, feedback effects, and the transmission of monetary policy to private sector credit.

The LOG_CPS equation exhibits strong inertia, as the first lag of credit to the private sector is positive and highly statistically significant. This indicates substantial persistence in private sector credit, implying that past levels of credit are a dominant determinant of current credit conditions. The second lag of LOG_CPS is negative but statistically insignificant, suggesting limited corrective adjustment beyond the first lag. Monetary policy variables display asymmetric effects on credit in the short run. While the lagged values of LOG_CRR are statistically insignificant, the first lag of LOG_LQR is positive and significant, indicating that improved liquidity conditions in the banking sector stimulate credit extension to the private sector in the short run. This finding underscores the importance of liquidity management as a channel through which monetary policy influences credit supply.

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In the LOG_CRR equation, lagged LOG_CRR is positive and highly significant, reflecting strong persistence in the conduct of reserve requirement policy by the monetary authority. Notably, the second lag of LOG_CPS is positive and statistically significant, implying that past expansions in private sector credit induce a tightening response through higher reserve requirements. This suggests a feedback mechanism whereby the monetary authority responds to credit growth in order to maintain financial stability. The second lag of LOG_LQR is negative and significant, indicating that excess liquidity in the banking system may lead to subsequent tightening of reserve requirements.

The LOG_LQR equation also shows significant own-dynamics, with the first lag of LOG_LQR being positive and strongly significant, suggesting persistence in liquidity conditions. The first lag of LOG_CPS is positive but statistically insignificant, while the second lag is weakly negative, implying that credit developments have only limited short-run influence on liquidity ratios. However, monetary policy variables play a notable role: the first lag of LOG_CRR negatively and significantly affects LOG_LQR, indicating that increases in reserve requirements reduce banking system liquidity, consistent with theoretical expectations.

From a model adequacy perspective, the VAR demonstrates strong explanatory power. The R-squared values for the LOG_CPS and LOG_CRR equations are exceptionally high, indicating that the included lagged variables explain most of the short-run variations in these series. Although the LOG_LQR equation records a relatively lower R-squared, it remains statistically significant overall, as evidenced by the F-statistic. The information criteria (AIC and SC) and the low determinant of the residual covariance matrix further suggest that the model is well specified and stable.

In summary, the VAR results reveal that credit to the private sector in Nigeria is highly persistent and responds positively to improved liquidity conditions, while cash reserve requirements exert an indirect and restrictive influence through their effect on banking sector liquidity. At the same time, the monetary authority appears to react to credit expansion by adjusting reserve requirements, highlighting a bidirectional interaction between monetary policy and private sector credit. These findings reinforce the view that liquidity management is a more immediate and effective short-run transmission channel of monetary policy to private sector credit than reserve requirements alone.

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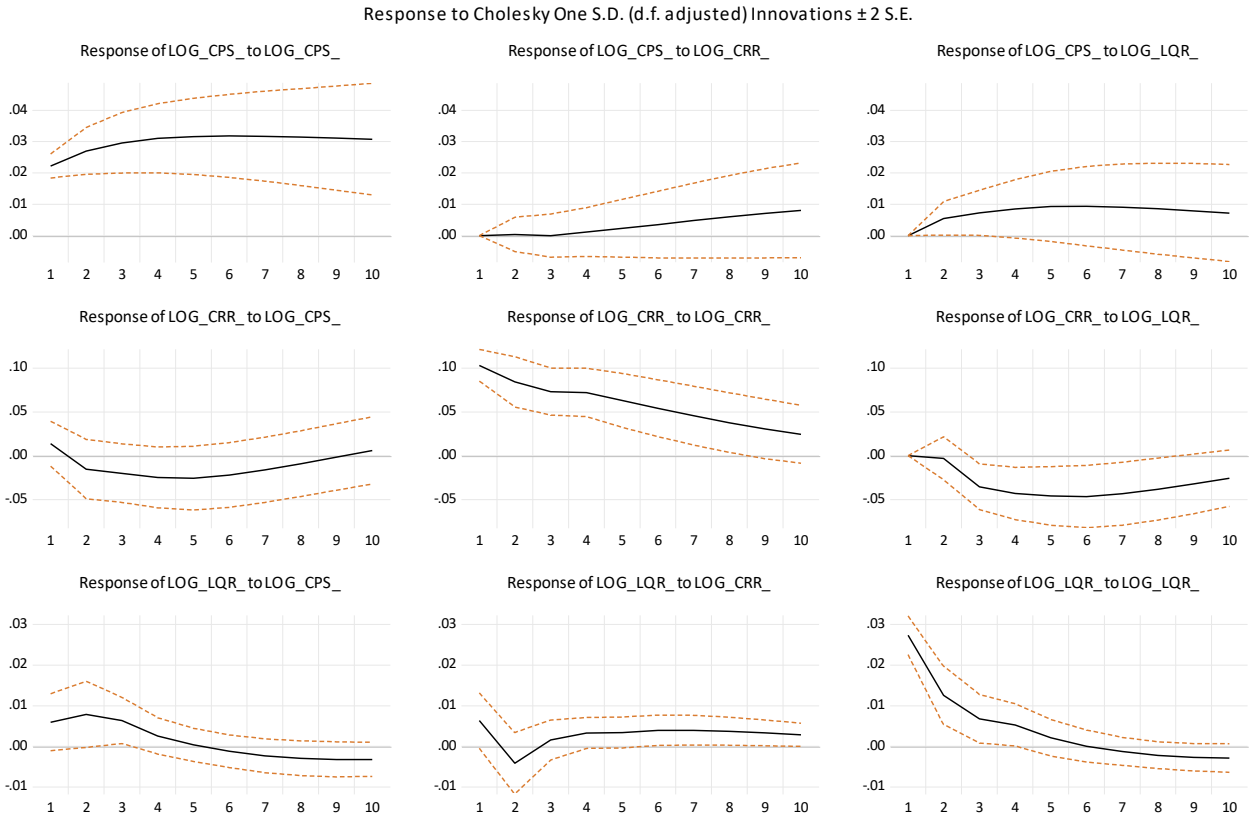
Table 7: Impulse Response Functions (IRFs)



Source: E-View 13 Output, 2025

The impulse response functions trace the dynamic effects of one-standard-deviation shocks to credit to the private sector (LOG_CPS), cash reserve ratio (LOG_CRR), and liquidity ratio (LOG_LQR) on each variable over a ten-quarter horizon, based on the Cholesky ordering LOG_CPS → LOG_CRR → LOG_LQR. The IRFs provide important evidence on the short- to medium-run transmission of monetary policy to private sector credit in Nigeria.

A shock to LOG_CPS generates a positive and persistent response of credit to itself throughout the forecast horizon. The magnitude increases gradually and stabilizes after about the fifth quarter, reflecting strong inertia and path dependence in private sector credit. This persistence is consistent with the VAR results and suggests that credit expansion in Nigeria tends to be self-reinforcing over time.

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A shock to LOG_CRR produces a very small but gradually increasing positive response of LOG_CPS. Although the effect is weak in magnitude, its persistence suggests that adjustments in the cash reserve ratio influence private sector credit only marginally in the short run. This muted response implies that reserve requirements may affect credit more indirectly, possibly through liquidity and balance-sheet channels rather than immediate lending behavior. By contrast, a shock to LOG_LQR elicits a consistently positive and rising response of LOG_CPS, peaking around the fifth to sixth quarter before slowly declining. This indicates that improvements in banking sector liquidity significantly stimulate credit to the private sector, confirming liquidity as a key monetary transmission channel in Nigeria. LOG_CRR responds strongly and positively to its own shock in the first period, after which the effect gradually decays but remains positive over the horizon. This reflects policy persistence in reserve requirement decisions by the monetary authority.

A shock to LOG_CPS initially raises LOG_CRR slightly but subsequently leads to a sustained negative response for most of the horizon. This pattern suggests that credit expansion may prompt a tightening policy response after an initial adjustment period, consistent with a countercyclical monetary stance aimed at containing excessive credit growth and potential inflationary pressures. A shock to LOG_LQR results in a negative response of LOG_CRR over most periods, indicating that higher liquidity conditions reduce the need for tighter reserve requirements. This inverse relationship reinforces the substitutability between liquidity management and reserve requirements as policy tools.

LOG_LQR reacts positively and strongly to its own shock in the first period, but the response diminishes steadily and becomes slightly negative toward the later horizons, suggesting mean reversion in liquidity conditions. A shock to LOG_CPS initially increases LOG_LQR, implying that credit expansion is associated with improved liquidity conditions in the short run, possibly due to accommodative policy or increased deposit mobilization. However, the response turns negative after several periods, indicating that sustained credit growth may eventually strain liquidity in the banking system. A shock to LOG_CRR produces a small but positive and persistent response of LOG_LQR. This suggests that higher reserve requirements may induce banks to hold additional liquid assets, thereby increasing measured liquidity ratios despite tighter policy.

The impulse response analysis highlights three key insights. First, private sector credit in Nigeria is highly persistent and responds most strongly to liquidity-related shocks rather than reserve requirement shocks. Second, liquidity ratio shocks have a clear and positive impact on credit expansion, underscoring liquidity management as an effective monetary policy transmission mechanism. In sum, the IRFs reinforce the conclusion that while cash reserve requirements play

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a regulatory and stabilizing role, banking sector liquidity is the dominant short-run channel through which monetary policy influences credit to the private sector in Nigeria

Table 8: Heteroskedasticity Test

F-statistic	0.809889	Prob. F(2,65)	0.4493
Obs*R-squared	1.653336	Prob. Chi-Square(2)	0.4375
Scaled explained SS	1.060588	Prob. Chi-Square(2)	0.5884

Source: E-View 13 Output, 2025

The Breusch–Pagan–Godfrey test was conducted to examine whether the residuals of the estimated model exhibit heteroskedasticity. The null hypothesis of this test states that the error variance is constant (homoskedastic), while the alternative hypothesis suggests the presence of heteroskedasticity. The reported F-statistic of 0.809889 has an associated probability value of 0.4493, which is well above the conventional 5 per cent significance level. Similarly, the Obs*R-squared statistic of 1.653336 yields a Chi-square probability of 0.4375, and the Scaled Explained Sum of Squares statistic of 1.060588 has a probability value of 0.5884. In all cases, the probability values exceed 0.05.

These results indicate a failure to reject the null hypothesis of homoskedasticity. Hence, there is no statistical evidence of heteroskedasticity in the residuals of the model. This implies that the variance of the error terms is constant across observations, satisfying a key assumption of classical linear regression and time-series modeling. In practical terms, the absence of heteroskedasticity suggests that the estimated coefficients and their standard errors are reliable and efficient. Consequently, statistical inferences drawn from the model such as hypothesis tests and confidence interval scan be considered valid within the context of this study on monetary policy and credit to the private sector in Nigeria.

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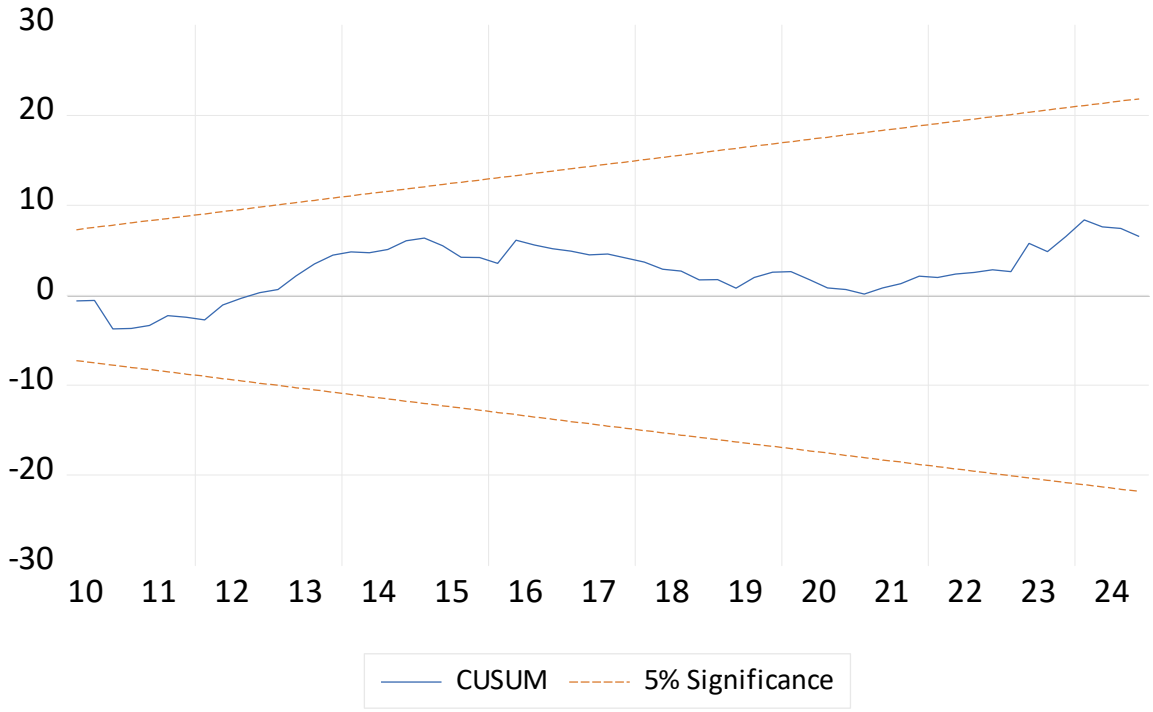
Table 9: CUSUM Test



The CUSUM test assesses the stability of the coefficients in the model over time. When the CUSUM plot remains within the upper and lower significance bounds such as the 10% confidence interval, the model is considered structurally stable. In this study, the CUSUM line stays below the 10% significance boundary, indicating that the estimated coefficients do not experience significant structural breaks throughout the sample period. This means the relationship between monetary policy variables (CRR and LQR) and credit to the private sector is stable, and the model's parameters are consistent over time. The absence of structural instability reinforces the reliability of the short-run VAR estimates and confirms that the model is suitable for policy analysis and forecasting.

7.0 DISCUSSION OF FINDINGS

The findings of this study provide important insights into how monetary policy instruments influence credit to the private sector in Nigeria. The Johansen Cointegration test revealed that a long-run relationship exists among the variables, indicating that monetary policy shocks do exert

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a stable, long-term influence on private sector credit. This aligns with the argument that Nigeria's monetary policy transmission mechanism remains strong in the long run due to structural rigidities and banking sector frictions (Ezeaku& Nwosu, 2022).

The short-run VAR estimates, however, showed that monetary policy has meaningful immediate effects on private sector credit. The cash reserve ratio (CRR) had a negative and statistically significant short-run impact on CPS, implying that higher reserve requirements immediately reduce the ability of banks to extend credit. This finding corroborates prior studies emphasizing that CRR operates as a liquidity-withdrawal tool that tightens credit conditions in the short run (Ogbonna &Oti, 2023). The insignificance of lagged CRR terms suggests that its effect is not persistent, which is consistent with banking literature showing that CRR adjustments produce strong but temporary liquidity shocks (Okpara&Danladi, 2021).

The liquidity ratio (LQR) exhibited mixed and largely insignificant effects on private sector credit, with only the first lag showing a marginal positive influence. This weak impact is expected given the low variability of LQR during the study period. Similar findings were reported by Adebayo and Adekunle (2020), who observed that liquidity ratios in Nigeria often remain constant and therefore do not play an active role in influencing credit cycles. The strong positive coefficient of lagged CPS indicates high persistence in private credit behaviour, reflecting the gradual adjustment process common in developing financial systems where lending relationships evolve slowly over time (Umar &Nwokolo, 2023).

8.0 CONCLUSION AND POLICY RECOMMENDATIONS

This study examined the short-run impact of monetary policy instruments specifically the cash reserve ratio (CRR) and liquidity ratio (LQR)on credit to the private sector in Nigeria. The results show that while private sector credit exhibits strong persistence over time, there is evidence of a stable long-run relationship between credit and monetary policy indicators. In the short run, CRR exerts a statistically significant negative effect on credit, confirming that tighter reserve requirements reduce banks' lending capacity. The liquidity ratio, however, has weak and largely insignificant effects, reflecting its stability over time and limited immediate influence on credit expansion. Diagnostic and stability tests further confirm that the model is well-specified, homoskedastic, free from serial correlation, and structurally stable. Overall, the findings highlight that monetary policy in Nigeria predominantly influences private sector credit through short-run channels rather than long-term equilibrium, suggesting that structural and institutional factors limit the effectiveness of policy transmission.

Based on these findings, policy measures are recommended to strengthen the effectiveness of monetary policy in stimulating private sector credit:

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i. Since CRR has a significant short-run effect on credit, CBN should reduce CRR ratio of 50% because this has imposed excessive constraints on lending. Complementary measures, such as targeted credit facilities or sector-specific incentives, can also help mitigate the contractionary impact on productive sectors.
ii. CBN could introduce more flexible liquidity requirements or develop dynamic liquidity frameworks that respond to banking sector conditions to promote credit expansion.

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