

Impact of Money Supply Structure on Economic Growth in Nigeria

¹Okonkwo Chikodili Lucy, ²Aigbdeion Isibor Marvelous, & ³Hezekiah Isa Grace

^{1,2&3}Department of Economics, Faculty of Social Sciences,
Bingham University Karu

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Abstract

There is a general view that the structure of money supply and its components play a crucial role in influencing the pace and sustainability of economic growth, particularly in developing economies like Nigeria. Therefore, this study examined the impact of money supply structure on economic growth in Nigeria using quarterly data from 2010Q1 to 2025Q4. Specifically, the study investigated the effects of narrow money (M1), quasi money (QM), broad money (M2), and extended broad money (M3) on Real Gross Domestic Product (RGDP). The Fully Modified Ordinary Least Squares (FMOLS) technique was employed for the analysis. The findings revealed that M1 ($\beta = 1.364654$, $p = 0.0043$), QM ($\beta = 2.208742$, $p = 0.0009$), and M3 ($\beta = 0.187308$, $p = 0.0224$) have positive and statistically significant impacts on economic growth, while M2 ($\beta = -3.625213$, $p = 0.0014$) exerts a negative and significant impact on RGDP. The model further showed that approximately 72.82% ($R^2 = 0.7282$) of the variations in economic growth are explained by the money supply variables. The study concludes that the impact of money supply on economic growth depends largely on the composition and efficient allocation of monetary aggregates. It therefore recommends that the Central Bank of Nigeria (CBN) strengthen financial intermediation, improve credit allocation to productive sectors, and deepen financial markets to support sustainable economic growth.

Keywords: *Economic Growth, Narrow money (M1), Quasi Money (QM), Broad Money (M2), and Extended broad money (M3).*

Corresponding Author: Okonkwo Chikodili Lucy

Background to the Study

The global perspective on monetary economics acknowledges the profound influence of money supply structure on a nation's economic growth and stability. The composition of monetary aggregates M1, QM, M2 and M3 represents the spectrum of liquidity available to fuel productive investment, consumption, and overall economic activity, a relationship emphasised by both classical and monetarist thought. Conversely, Keynesian and structuralist schools highlight the complex transmission mechanisms linking these aggregates to real-sector performance through financial intermediation.

In Nigeria, the financial landscape has undergone significant transformation, marked by an expanded and diversified money supply following a series of sectoral reforms. In response, the CBN (2020) has deployed a range of monetary policy instruments to curb inflation, stabilise the exchange rate, and foster sustainable development. A well-structured money supply is crucial for directing liquidity towards productive investments, thereby stimulating aggregate demand, enhancing capital formation, and boosting long-term economic output, whereas an inefficient monetary structure can lead to inflationary consumption, exchange rate volatility, and speculative activities that hinder real sector growth (Adeniran *et al.* 2019; Ehikioya *et al.* 2022). Therefore, discerning the distinct impacts of M1, M2, M3, and quasi-money is critical to identifying which components most impactfully drive Nigeria's development trajectory. However, the empirical evidence in Nigeria remains inconclusive. Several studies affirm a strong positive contribution of the aggregate money supply to output expansion (Alfa, Ayodeji and Ugah, 2020; Udeh, 2021), while others report weak or even negative effects, contingent on the specific monetary aggregate examined, the methodology employed, and the study period (Okoro, 2019; Ezeaku, 2021). These contradictory findings underscore the necessity for a renewed discourse on the composition of the money supply, particularly within Nigeria's evolving financial landscape, which is increasingly characterised by reliance on credit markets and persistent macroeconomic instability.

Therefore, the monetary authorities over the years have consistently strived to fine-tune the financial system to enhance its impact on growth, for instance, through the implementation of the Structural Adjustment Programme (SAP) in 1986 which liberalised the financial sector, the establishment of the Asset Management Corporation of Nigeria (AMCON) in 2010 to resolve non-performing loans, and the ongoing reforms under the Bankers' Committee to deepen credit to the real sector. On the other hand, the CBN has also launched several direct intervention programmes to improve the flow of finance, for example, the Commercial Agriculture Credit Scheme (CACS), the Power and Aviation Intervention Fund (PAIF), the Micro, Small and Medium Enterprises Development Fund (MSMEDF), and the Anchor Borrowers' Programme (ABP). Effective monetary management is measured by the growth of key aggregates, price stability, and a stable exchange rate, among other factors that promote a conducive environment for investment (CBN, 2020). The workings of monetary policy and financial intermediation are closely connected modules that work together to make the economy more productive.

The Nigerian government recognised that a stable and growth-inducing money supply is a critical prerequisite for the country's economic diversification, industrialisation, and social progress and has made several efforts to improve its economic indicators by exploring various monetary policy frameworks, including monetary targeting and more recently, the transition to an inflation-targeting regime, all embedded within broader national plans like the Economic Recovery and Growth Plan (ERGP) and the present National Development Plan, all of which were designed to ensure price stability, maintain a stable exchange rate, and support sustainable economic growth (CBN, 2020).

Despite various policy efforts by the monetary authorities, the country continues to face significant challenges limiting the effectiveness of monetary policy in stimulating robust and inclusive economic growth. Some of these challenges include the high dominance of M1, signifying a large informal sector; persistent inflationary pressures; a weak transmission mechanism; fiscal dominance, which often contradicts monetary policy goals; and high lending rates, which discourage real-sector investments compared to other emerging economies. This situation creates a critical research gap, necessitating an empirical investigation to disentangle the specific impacts of different money supply components to provide a clearer policy direction for sustainable economic growth in Nigeria.

Against this backdrop, this research explores the impact of the structure of money supply (M1, QM, M2, and M3) on Nigerian economic growth. Disaggregating the money supply will provide evidence-informed insights on how various types of liquidity contribute to growth, thus providing useful implications for designing as well as administering monetary policy. The primary objective of this study is to investigate the impact of the money supply structure (M1, QM, M2 and M3) on economic growth in Nigeria.

Statement of Hypothesis

The paper's hypotheses are stated as follows:

- H₀₁:** Narrow money (M1) has no significant impact on economic growth in Nigeria
- H₀₂:** Quasi money (QM) has no significant impact on economic growth in Nigeria
- H₀₃:** Broad money (M2) has no significant impact on economic growth in Nigeria
- H₀₄:** Extended broad money (M3) has no significant impact on economic growth in Nigeria

Literature Review

Conceptual Review

Money-supply structure

Money-supply structure refers to the composition and relative magnitudes of different monetary aggregates in an economy (for example, M1, QM, M2, and M3). It captures how liquidity is distributed between transactional balances, near-money, and longer-term deposit instruments, and it shapes how monetary policy impulses transmit to spending, savings and investment (World Bank, 2024). Understanding the money-supply structure is critical because distinct aggregates operate through different channels, transaction, credit and portfolio, and therefore have heterogeneous effects on real economic activity. In analysing how, the structure

of money supply affects economic growth in Nigeria, it is essential first to clarify what is meant by different money aggregates (M1, QM, M2, and M3), how they are constructed, and how they are used in monetary policy discourse in Nigeria. These money aggregates differ in their liquidity, volatility, and the speed with which they respond to and influence economic activity.

Narrow Money (M1) refers to the most liquid forms of money in an economy, currency in circulation plus demand (current) deposits held by the public at commercial banks (CBN, 2017; Yunana and Amba, 2016). In Nigeria, M1 is often used as a measure of liquidity immediately available for transactions, given its role in consumption and everyday spending (CBN, 2017). Quasi-money (QM) comprises savings deposits, time deposits, and other non-demand deposits that are less liquid than M1 but still convertible into cash at little cost (Umeora, 2010; Omankhanlen, *et.al.* 2022). These deposits contribute to the broader money supply and reflect savings that could be channelled into investment, depending on the efficiency of financial intermediation. M2 is a broader aggregate that includes M1 plus quasi-money. It captures both transaction balances and deposits that are less immediately liquid (CBN, 2017; Umeora, 2010). In empirical studies of Nigeria, M2 is frequently used as the primary measure of money supply to assess its impact on growth, because it better reflects the capacity of the banking and financial system to provide liquidity for investment purposes (Omankhanlen *et al.* 2022). Extended Broad Money (M3) extends M2 to include larger time deposits, institutional funds, foreign currency deposits, and other near-money liabilities (CBN, 2017; Omankhanlen *et al.* 2022). Although M3 is less commonly used in CBN's routine reports compared to M2, it is considered important in theoretical discussions of financial depth and the potential of long-term financing.

Economic Growth

Economic growth is measured here by Real Gross Domestic Product (RGDP). It reflects the inflation-adjusted value of goods and services produced in an economy over time. RGDP is the standard indicator of productive performance and improvements in living standards; changes in RGDP capture how effectively monetary resources are converted into real output (World Bank, 2024).

Theoretical Review

The relationship between money supply and economic growth has been widely theorised in monetary economics, with different schools of thought offering contrasting perspectives on its channels and effectiveness. The classical and monetarist perspectives, drawing on Friedman's (1968) restatement of the Quantity Theory of Money, posit that changes in the money supply directly affect nominal income ($MV = PY$). In this view, stable money growth supports real output in the short run, but sustained excess money creation fuels inflation rather than long-term growth.

Keynesian theory departs from this position by emphasising the role of money through the interest rate channel, as formalised in the IS–LM framework (Keynes, 1936). An increase in money supply lowers interest rates, thereby stimulating investment and aggregate demand.

However, the effectiveness of this mechanism depends on liquidity preference and financial market conditions. Similarly, Tobin's (1969) portfolio balance approach highlights substitution between money and interest-bearing assets, implying that broader aggregates such as M2 and M3, comprising time deposits and quasi money, are important determinants of wealth allocation and, consequently, investment decisions.

In developing economies, the McKinnon–Shaw financial liberalisation hypothesis (McKinnon, 1973; Shaw, 1973) provides an additional dimension, suggesting that broad money supply promotes growth only when financial repression is reduced and financial markets are deepened. By mobilizing savings and extending credit to the private sector, broader money aggregates can enhance productive investment and long-term growth. More recent endogenous-money and credit-channel theories argue that bank lending creates money, meaning that private-sector credit and financial intermediation quality are often stronger drivers of growth than narrow monetary aggregates alone (Bernanke and Gertler, 1995).

The implications of these theories for Nigeria are significant. In a context characterised by high informality, persistent inflation, and weak financial intermediation, narrow money (M1) often captures transactional balances in the informal sector but has limited influence on formal GDP growth (Adeniran, *et al.* 2019). Conversely, broad money (M2 and M3) and quasi money, by reflecting financial deepening and credit intermediation, may exert stronger long-term effects on growth (Ehikioya, *et al.* 2022; Udeh, 2021). However, empirical studies remain divided, with some reporting positive and significant impacts (Alfa *et al.* 2020), while others find weak or even negative relationships depending on the period of study, suggesting that institutional quality, inflationary pressures, and policy credibility condition the money–growth nexus. Overall, theory suggests that the structure of money supply matters: M1 primarily affects short-run liquidity and transactions, while M2, M3, and quasi money are more relevant for investment, savings mobilization, and long-run growth. This theoretical expectation provides the foundation for the empirical analysis in this study.

Empirical Review

Ogunseni *et al.* (2026) examined the relationship between digital financial services and economic growth in Nigeria using annual time-series data and the Autoregressive Distributed Lag (ARDL) bounds testing approach. The study found that account ownership and internet penetration, two key indicators of financial inclusion and digital financial access, exerted positive short-run effects and sustained long-run impacts on GDP per capita. These results suggest that expanding access to formal financial services and digital infrastructure enhances economic participation, resource mobilisation, and productivity, thereby contributing meaningfully to long-term growth performance. The findings provide strong empirical support for the concept of Financial Deepening, which refers to the broadening of financial markets, instruments, and institutions to improve the mobilisation and allocation of resources.

Nkechi *et al.* (2026) evaluated the relationship between monetary policy and unemployment in Nigeria using the ARDL bounds testing framework over an extended time horizon. The study provides empirical evidence that the money supply exerts a positive and statistically significant effect on employment generation, indicating that monetary expansion can stimulate labour demand by raising aggregate demand and investment activity. In contrast, a high MPR was found to constrain both economic growth and employment, reflecting the contractionary effects of tight monetary policy on borrowing costs, investment, and productive activity. Furthermore, the study establishes that inflation and exchange rate instability maintain significant relationships with unemployment in both the short run and the long run.

Wahab and Adelowotan (2025) investigated the impact of money supply and exchange rate movements on economic growth in Nigeria over a twenty-year period. Using descriptive statistics, inferential statistics, and the Pearson Correlation Coefficient, the study found that money supply exerted a positive and statistically significant effect on gross domestic product growth, indicating that monetary expansion can stimulate aggregate demand, investment activity, and productive output when liquidity conditions support the real sector. In contrast, exchange rate volatility was found to have a significant adverse effect on economic performance, suggesting that instability in the value of the naira undermines growth through imported inflation, investor uncertainty, and higher production costs for import-dependent sectors. The positive growth effect of money supply is consistent with the Monetary Transmission Mechanism, which explains how liquidity expansion can influence output through credit creation, lower financing constraints, and stronger consumption demand. However, the negative effect of exchange rate volatility highlights that monetary expansion alone may not be sufficient to secure sustainable growth where macroeconomic instability persists. The study therefore concluded that monetary management and exchange rate policy must be coordinated simultaneously to achieve sustainable and inclusive economic growth. The evidence from this study provides important support for analysing money supply within a broader macroeconomic policy environment rather than in isolation. It suggests that the growth effects of monetary aggregates in Nigeria depend not only on domestic liquidity conditions but also on exchange rate stability, policy coordination, and the capacity of the economy to absorb monetary expansion without generating destabilising external imbalances.

Kazeem *et al.* (2024) explored the dynamic relationship between money supply growth (M2) and GDP growth in Nigeria over the period 2008–2023 using a state-space modelling approach. The model successfully captures the interaction between M2 growth and GDP growth, underscoring M2's relevance as an explanatory factor. Findings indicate that the standard deviation of the observation error is low yet statistically significant, implying that the model explains variations in GDP effectively. The log-likelihood value further suggests a reasonably good model fit. While consistent with theoretical predictions that emphasise the critical role of money supply in driving economic growth, the study also notes the need to extend future research by incorporating additional macroeconomic variables and alternative models for deeper insights.

Oseni and Oyelade (2023) examined the combined effects of monetary and fiscal policies on economic growth in Nigeria, employing key macroeconomic variables such as gross capital formation, total employment, broad money supply, and lending interest rate. The results indicated that gross capital formation, employment, and the broad money supply had positive and statistically significant effects on GDP, highlighting their importance as growth drivers. Conversely, lending interest rate was found to have a negative and significant effect on economic growth, suggesting that high borrowing costs constrain productive investment.

Akinbola and Ezeala (2023) analysed the relationship between money market operations and economic growth in Nigeria over the period 1998–2012, employing the Ordinary Least Squares (OLS) technique. The analysis incorporated GDP (in logarithmic form), the exchange rate, inflation, the interest rate, and the logarithm of the money supply as explanatory variables. The findings showed that money supply, represented as LOG(MS), exerted a highly significant positive effect on economic growth (T-statistic = 8.83, p-value = 0.0000), highlighting the central role of money market development in driving growth. By contrast, exchange rate, inflation, and interest rate were not statistically significant, suggesting that these macroeconomic indicators did not strongly influence growth within the study period. The robustness of the model was confirmed by an R-squared value of 0.97 and an F-statistic of 83.95 (p-value = 0.0000), highlighting the explanatory power of the money supply in accounting for variation in Nigeria's GDP.

Ehikioya *et al.* (2022) evaluated the impact of money supply on economic growth in Nigeria over the period 1990–2018, employing the ARDL model. Their findings revealed that broad money supply exerted a positive, though weakly significant, effect on economic growth, suggesting that while monetary expansion may support output, its influence is limited. In contrast, credit to the private sector exhibited an inverse and statistically significant relationship with economic growth, indicating that increased private-sector credit in Nigeria has not translated into productive investment and may even hinder growth outcomes.

Amadi *et al.* (2022) investigated the effects of money supply on economic growth in Nigeria using time series data covering 1981–2019 obtained from the CBN. Unit root tests confirmed that the variables were stationary at the first difference. Johansen co-integration results indicated the existence of a long-run relationship between money supply and GDP. The error correction model revealed that broad money supply exerted a positive but marginal impact on GDP, while interest rate displayed a negative and significant relationship with GDP. Furthermore, the pairwise Granger causality test showed evidence of unidirectional causality running from GDP to broad money supply.

Loiremba *et al.* (2022) analysed the relationship between monetary policy and economic growth in Nigeria, incorporating the roles of interest rate, money supply, and financial inclusion over the period 2004Q1–2020Q4, with projections extending for 30 quarters. Employing the dynamic simulation ARDL model, the study revealed that in the short run, only money supply exerted a statistically significant effect on economic growth. In the long run, however, interest rate, money supply, and financial inclusion all demonstrated significant

impacts on growth. These results were further validated through dynamic simulated ARDL plots, which showed the predicted responses of economic growth to $\pm 1\%$ shocks in interest rate, money supply, and financial inclusion across different time horizons.

Akujuobi and Chikezie (2022) assessed the effect of broad money supply on Nigeria's economic growth over the period 1981–2021, employing the ARDL model. The results indicated the existence of a long-run relationship between money supply and RGDP, whereas a combination of broad money supply indices, monetary policy rate, inflation, and interest rate showed no long-run association with growth. In the short run, money supply exerted a positive and significant effect on economic growth, while interest rate displayed a positive but insignificant relationship with RGDP.

Razia and Omarya (2022) explored the impact of M2 on per capita economic growth in Palestine using time-series data spanning 2000–2020. Applying the ARDL model, alongside co-integration and error correction techniques, the analysis incorporated GDP per capita, broad money supply, gross fixed capital formation, and inflation rate as key variables. The results indicated that in the short run, money supply, capital formation, and inflation exerted positive effects on economic growth, reflecting the immediate role of monetary and investment factors in driving output. However, in the long run, none of these variables showed a significant impact on growth, suggesting that the influence of monetary expansion and investment on Palestine's economy is largely transitory rather than sustained.

Olowookere *et al.* (2021), covering the period 1992–2019, investigated the relationship between Small and Medium-sized Enterprises (SMEs) financing and sustainable economic growth in Nigeria. Following pre-estimation procedures such as unit root and co-integration tests, the analysis employed the FMOLS method alongside Granger causality tests. The findings revealed that broad money supply and GDP growth rate exhibited an insignificant inverse relationship, suggesting that monetary expansion did not translate effectively into SME-driven growth during the study period. This outcome shows structural weaknesses in financial intermediation and the limited capacity of SMEs to leverage monetary resources for sustainable economic development.

Opata and Obasikene (2021) investigated the impact of money supply on economic growth in Nigeria (1986 - 2021), with particular focus on broad money supply and the ratio of private sector credit to GDP. Adopting an ex-post facto research design, the analysis employed descriptive statistics, unit root tests, and Ordinary Least Squares (OLS) estimation. The findings revealed that both broad money supply and private sector credit significantly and positively influenced economic growth, underscoring their importance as drivers of Nigeria's economic performance.

Alfa *et al.* (2020) examined the relationship between money supply and economic growth in Nigeria using a Vector Autoregressive (VAR) framework, complemented by impulse response functions and Cholesky variance decomposition. Their study found that currency in circulation had a positive and significant effect on RGDP, highlighting the relevance of cash-

based transactions in Nigeria's largely informal economy. In contrast, M1 emerged as a weak predictor of RGDP, suggesting the limited influence of narrow money on output growth. Interestingly, while M2 demonstrated a significant but negative impact on RGDP, the variance decomposition results indicated that M2 remains a strong predictor of economic activity in the long run.

Omero (2019) sought to establish the joint and individual effects of money supply mechanisms on economic growth in Nigeria and Ghana, using annual data from 2009 to 2018, analysed with the Ordinary Least Squares (OLS) regression technique. The findings revealed cross-country differences: in Nigeria, M2 had an insignificant negative effect on RGDP, while in Ghana it exerted a significant positive effect. Similarly, M3 showed an insignificant positive effect on Nigeria's RGDP but a significant negative effect in Ghana. Credit to the Private Sector (CPS) displayed an insignificant positive relationship with RGDP in both countries. The study recommended that monetary authorities in Nigeria and Ghana should adopt strategies that better harness the potential of money supply mechanisms, particularly M2 and CPS, given their importance for promoting economic expansion, higher output, and employment.

Methodology

Research Design and Source of Data

The study employed a secondary method of data collection within an ex-post facto research design. Time series data were sourced from the CBN Statistical Bulletin (2025). Specifically, quarterly data spanning sixty-four observations, from Q1 2010 to Q4 2025, were collected. The variables considered include monetary supply indicators, M1, QM, M2 and M3, and a real sector indicator, RGDP. The RGDP reflects the productivity and overall health of the Nigerian economy, was adopted as the proxy for economic growth.

Model Specification

The study adopted the work of Opat and Obasikene, who investigated the *Impact of Money Supply on Economic Growth in Nigeria from (1981 – 2021)*, with particular focus on broad money supply and the ratio of private sector credit to GDP. He used the FMOLS as the analytical tool.

$$GDP = f(M_2, RCPSGDP) \quad (1)$$

Where: GDP = Gross Domestic Product, M_2 = Broad Money Supply and RCPSGDP = Ratio of Credit to the Private Sector to GDP. Equation (1) was modified and specified to follow the paper objective which is to investigate the impact of the money supply structure (M1, M2, M3, and quasi money) on economic growth in Nigeria

$$RGDP = f(M1, QM, M2, M3) \quad (2)$$

The study established the explicit relationship in equation (3) between money supply structure and economic growth in Nigeria as stated in equation (2), showing the impact of the money supply structure on economic growth in Nigeria:

$$RGDP_t = \beta_0 + \beta_1 M1 + \beta_2 QM + \beta_3 M2 + \beta_4 M3 + \mu_t \quad (3)$$

Where:

RGDP is the real gross domestic product of Nigeria, M1 is the narrow money, M2 and M3 are broad money, and Quasi Money (QM) is the less liquid financial instruments.

Method of Data Analysis

The study used FMOLS to analyse and estimate the variables. The FMOLS was developed by Phillips and Hansen (1990). The method was specifically formulated to produce efficient and unbiased estimates in the presence of co-integration among non-stationary time series variables. Unlike conventional least squares, which can yield biased and inconsistent results when the regressors are endogenous or serially correlated, FMOLS introduces parametric corrections to account for both serial correlation in the residuals and endogeneity among the explanatory variables. By doing so, it ensures that the long-run relationships among variables are estimated accurately, even in small samples. This makes FMOLS particularly suitable for this study. The unit root was used to measure the stationarity properties of the variables while the descriptive statistics was used to ascertain the individual characteristics of the variables. The a priori expectation is that $\lambda_1 \lambda_2 \lambda_3 \lambda_4 > < 0$ indicates a positive or negative relationship between money supply structure (M1, QM, M2 and M3) and economic growth (GDP). This means that an increase or decrease in money supply structure (M1, QM, M2 and M3) will lead to a decrease/increase in economic growth in Nigeria.

However, to establish the relationship and Impact of money supply structure on economic growth in Nigeria using FMOLS, equation (4) was formulated as:

$$RGDP_t = \lambda_0 + \lambda_1 M1 + \lambda_2 QM + \lambda_3 M2 + \lambda_4 M3 + \sum_{i=1}^m \lambda_6^i \Delta M1_t + \sum_{i=1}^n \lambda_7^i \Delta M1_{t+i} + \sum_{i=1}^o \lambda_8^i \Delta M1_{t-i} + \sum_{i=1}^p \lambda_9^i \Delta QM_t + \sum_{i=1}^q \lambda_{10}^i \Delta QM_{t+i} + \sum_{i=1}^r \lambda_{11}^i \Delta QM_{t-i} + \sum_{i=1}^s \lambda_{12}^i \Delta M2_t + \sum_{i=1}^t \lambda_{13}^i \Delta M2_{t+i} + \sum_{i=1}^u \lambda_{14}^i \Delta M2_{t-i} + \sum_{i=1}^v \lambda_{15}^i \Delta M3_t + \sum_{i=1}^w \lambda_{16}^i \Delta M3_{t+i} + \sum_{i=1}^x \lambda_{17}^i \Delta M3_{t-i} + \mu_t \quad (4)$$

Where: λ_0 is the constant parameter, $\lambda_1 \lambda_2 \lambda_3 \lambda_4$ are parameter co-efficient in the long run dynamics. Δ is the first difference operator. μ_t is the Error term.

Presentation and Discussion of Result

Descriptive Analysis

Table 1: Descriptive Summary

	RGDP	M1	QM	M2	M3
Mean	17244.25	14110.17	22639.75	36749.92	38922.39
Median	17209.02	9447.20	14474.81	23934.59	28721.06
Maximum	22609.93	38814.10	74523.60	113337.7	113355.1
Minimum	12583.48	4992.78	5914.52	10907.3	10961.6
Std. Dev.	2183.60	10101.08	19958.83	29984.23	29119.42
Skewness	0.134424	1.324180	1.566833	1.485760	1.447232
Kurtosis	2.691726	3.410130	4.216905	3.940177	3.943621
Jarque-Bera	0.446166	19.15203	30.13524	25.90364	24.71557
Probability	0.800048	0.000069	0.000000	0.000002	0.000004
Sum	1103632	903050.8	1.170000	2351995	2491033
Sum Sq.					
Dev.	3.00000	6.430000	2.510000	5.660000	5.340000
Observations	64	64	64	64	64

Source: Author's Computation Using EViews-12 (2025)

Table 1 presents the descriptive statistics of the key variables, RGDP, M1, QM, M2, and M3, for the period 2010Q1 to 2025Q4, covering 64 quarterly observations. The results show that RGDP recorded a mean value of ₦17,244.25 billion, with a minimum of ₦12,583.48 billion and a maximum of ₦22,609.93 billion. This indicates that Nigeria's real output grew moderately during the study period, with a standard deviation of ₦2,183.60 billion suggesting relatively stable growth in the country's economic performance. For the monetary aggregates, M1 (narrow money) had a mean of ₦14,110.17 billion, reflecting the average volume of highly liquid assets (currency in circulation and demand deposits) in the Nigerian economy. Its relatively high standard deviation of ₦10,101.08 billion and a huge gap between the minimum of ₦4,992.78 billion and maximum of ₦38,814.10 billion suggest that M1 experienced substantial growth and fluctuations over time, possibly due to changing liquidity conditions and monetary policy adjustments. QM had a mean of ₦22,639.75 billion, which is higher than M1, indicating the growing role of savings and time deposits in the Nigerian financial system. The large standard deviation of ₦19,958.83 billion shows that quasi money also fluctuated widely, likely reflecting shifts in financial deepening and savings behaviour over the years.

M2, which combines M1 and QM, recorded a mean value of ₦36,749.92 billion, showing the broad liquidity level available in the economy. The highest standard deviation of ₦29,984.23 billion further highlights volatility in overall money supply conditions, possibly driven by policy reforms, inflationary pressures, and capital flows. Similarly, M3, the broadest measure of money supply, including large time deposits, had the highest mean of ₦38,922.39 billion and exhibited a standard deviation of ₦29,119.42 billion, indicating that Nigeria's monetary base expanded substantially over the years, but with significant fluctuations.

Regarding the distributional properties, RGDP displayed near-symmetry with a skewness value of 0.134 and kurtosis of 2.692, which are close to the normal distribution parameters (0 and 3, respectively). However, the monetary variables (M1, QM, M2, and M3) are all positively skewed: 1.324, 1.567, 1.486, and 1.447, respectively. As for kurtosis, M1, QM, M2, and M3 have values of 3.410, 4.217, 3.940, and 3.944, respectively, indicating that they are all leptokurtic. This implies that they have long right tails and are more peaked than the normal distribution, suggesting that periods of unusually high money supply values occurred more frequently than extreme low values.

The Jarque-Bera test confirms these observations: while RGDP is normally distributed ($p = 0.800 > 0.05$), the monetary aggregates are not ($p < 0.01$). This non-normality could be attributed to the influence of policy shocks, inflationary episodes, or structural changes in the financial sector. Overall, the descriptive analysis indicates that while Nigeria's economy recorded steady growth in GDP during the period under review, monetary aggregates exhibited considerable fluctuations, reflecting the dynamic nature of monetary policy operations and liquidity management in the country.

Correlation analysis

This section shows the correlation analysis of the variables used in this paper.

Table 2: Correlation Analysis

Correlation Probability	GDP	M1	QM	M2	M3
RGDP	1.000000 -----				
M1	0.737552 0.0000	1.000000 -----			
QM	0.733799 0.0000	0.988731 0.0000	1.000000 -----		
M2	0.736915 0.0000	0.995023 0.0000	0.998727 0.0000	1.000000 -----	
M3	0.754325 0.0000	0.989259 0.0000	0.997739 0.0000	0.997400 0.0000	1.000000 -----

Source: Author's Computation Using EViews-12 (2025)

Table 2 presents the correlation coefficients among the study variables, RGDP, M1, QM, M2, and M3, for the period 2010Q1 to 2025Q4. The correlation analysis helps to determine the degree and direction of linear association between economic growth and the various measures of money supply in Nigeria. The results show that RGDP is positively and strongly correlated with all monetary aggregates, suggesting that an increase in money supply is

generally associated with an increase in economic output. Specifically, RGDP shows a strong positive correlation with M1 ($r = 0.7376$), QM ($r = 0.7338$), M2 ($r = 0.7369$), and M3 ($r = 0.7543$). All correlations are statistically significant at the 1% level ($p < 0.01$), implying that changes in monetary aggregates are significantly related to changes in economic growth. Among these, M3 exhibits the strongest correlation with RGDP, indicating that the broadest measure of money supply (including large time deposits) has the closest association with Nigeria's real output over the study period.

In addition, the monetary aggregates show very high inter-correlations among themselves. For instance, M1 and M2 are almost perfectly correlated ($r = 0.9950$), as are QM and M2 ($r = 0.9987$), and QM and M3 ($r = 0.9977$). These strong relationships are expected, as each indicator represents an integral component of the broader money supply framework, where M2 and M3 include M1 and QM, respectively. However, such high correlations may also suggest the presence of multicollinearity, which could influence regression estimates if all variables are included simultaneously in the same model.

Overall, the correlation analysis reveals a strong and statistically significant positive relationship between money supply and economic growth in Nigeria, consistent with Keynesian and monetarist theories that propose money supply as a key determinant of aggregate demand and output levels. The results also highlight the interconnectedness of monetary aggregates, reflecting the integrated nature of Nigeria's financial system and the cumulative impact of liquidity on economic performance.

Unit Root Test

To ensure that the time series data are suitable for empirical estimation, the Augmented Dickey-Fuller (ADF) unit root test was employed to determine the stationarity properties of the variables: RGDP, M1, QM, M2, and M3 for the period 2010Q1- 2025Q4. The null hypothesis of the ADF test states that a variable has a unit root (non-stationary), while the alternative hypothesis indicates stationarity. The results are evaluated at the 5% significance level, and a variable is considered stationary if the ADF test statistic is greater (in absolute terms) than the 5% critical value, or if the probability value is less than 0.05.

Table 3: Unit Root Test Result

Variable	Augmented Dickey-Fuller (ADF) Test		
	ADF	Critical Value@ 5%	Status
GDP	-3.837885	-3.489228	1(1)
M1I	-7.582538	-3.483970	1(1)
QM	-5.486895	-3.483970	1(1)
M2I	-6.294532	-3.483970	1(1)
M3I	-3.982232	-3.485218	1(1)

Source: Author's Computation Using EViews-12 (2025)

Table 3 presents the results of the unit root (stationarity) test of the variables employed in this study, using the ADF approach. The test results indicate that all the variables, RGDP, M1,

QM, M2, and M3, were stationary at the 5% level of significance after first differencing, signifying that they are integrated of order one, I(1). This implies that the time series data used in the analysis are stable after first differencing, thus avoiding the problem of spurious regression. Consequently, since all variables are integrated of the same order, I(1), it is appropriate to proceed with the co-integration test and long-run estimation techniques using the FMOLS method to examine the long-run relationship between the money supply structure and economic growth in Nigeria.

Co-integration Test Results

This section shows the Engle and Granger co-integration test of the variables used in this paper.

Table 4: Results of Engle and Granger (Residual Based) Co-integration Test

Variable	ADF Test Statistic	95% Critical ADF Value	Remarks
Residual	-3.877588	-2.911730	Co-integrated

*Note: ** significant at 5%*

Source: Author's Computation Using EViews-12 (2025)

Table 4 shows the results of the Engle and Granger (Residual Based) Co-integration Test. The residual series, derived from the long-run equilibrium equation estimated with the variables of interest, exhibits an ADF test statistic of -2.891783. This value is more negative than the provided 95% critical ADF value of -1.947381, which is significant at the 5% level. This indicates that the null hypothesis of no co-integration can be rejected, and thus, the study concludes that the variables RGDP, M1, Broad money (M2 and M3), and Quasi Money (QM) are co-integrated.

This finding of a co-integrating relationship has profound implications for the analysis of money supply and economic output in Nigeria. It confirms the existence of a stable, long-term equilibrium relationship among these monetary aggregates and the RGDP. This means that despite short-term fluctuations and deviations, the overall level of economic activity and the different measures of money supply move together in the long run. For policymakers at the CBN, this implies that monetary policy, through its influence on both narrow and broad money, has a sustained and predictable long-run impact on the health of the economy. Consequently, any short-term disequilibrium between the money supply and economic output will correct itself over time, validating the use of monetary aggregates as reliable indicators for long-term policy formulation.

Table 5: Fully Modified Ordinary Least Square

Dependent Variable: GDPI				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
M1I	1.364654	0.458609	2.975640	0.0043
QMI	2.208742	0.631859	3.495624	0.0009
M2I	-3.625213	1.078137	-3.362479	0.0014
M3I	0.187308	0.079828	2.346401	0.0224
C	10.74131	0.744709	14.42350	0.0000
R-squared	0.728218			
Adjusted R-squared	0.709474			
Wald Test	37.886			
Long-run Variance	0.001439			

Source: Author's Computation Using EViews-12 (2025)

To estimate the long-run relationship between money supply components and economic growth in Nigeria, the FMOLS technique was employed. This approach corrects for serial correlation and endogeneity in co-integrated systems, making it particularly suitable for long-run analysis of a time series. The dependent variable is RGDP, while the explanatory variables are M1, QM, M2 and M3. The coefficient of M1 (1.364654) is positive and statistically significant at the 1% level (probability = 0.0043), suggesting that in the long run, an increase in narrow money supply is associated with an increase in economic growth. QM has a positive coefficient (2.208742) and is statistically significant at the 1% level (Probability = 0.0009). M2 has a negative (-3.625213) and statistically significant impact on RGDP (probability = 0.0014). This suggests that a higher level of M2 contributes negatively to long-term economic growth, contrary to expectations. M3 shows a positive (0.187308) and statistically significant coefficient (probability = 0.0224), implying that broader aggregates of money supply (including large time deposits and institutional funds) influence growth positively. The positive and significant constant term ($C = 10.74131$, $p=0.0000$) indicates that other non-monetary factors also contribute positively to economic growth, even when monetary aggregates are held constant.

Furthermore:

- H₀₁:** M1 has no significant impact on economic growth in Nigeria is rejected, given that the probability value of 0.0043 is less than the 5% level of significance. This implies that M1 has a positive significant impact on economic growth in Nigeria.
- H₀₂:** QM has no significant impact on economic growth in Nigeria is rejected, given that the probability value of 0.0009 is less than 0.05. This implies that QM has a positive significant impact on economic growth in Nigeria.
- H₀₃:** M2 has no significant impact on economic growth in Nigeria is rejected, given that the probability value of 0.0014 is less than the 5% level of significance. However, the impact is negative, implying that M2 has a negative significant impact on economic growth in Nigeria.
- H₀₄:** M3 has no significant impact on economic growth in Nigeria is rejected as the

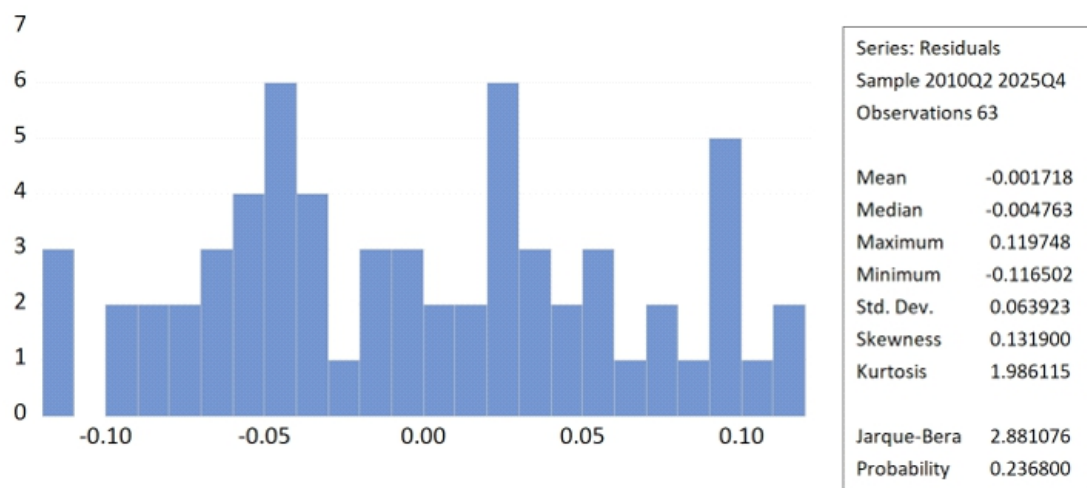
probability value of 0.0224 is less than 0.05, which implies that M3 has a positive significant impact on economic growth in Nigeria.

The R-squared value (0.7282) indicates that approximately 72.82% of the variations in economic growth are explained by the money supply variables, while the remainder is due to other factors not captured in the model.

The FMOLS results reveal that the structure of money supply has mixed effects on Nigeria's economic growth in the long run. While M1, QM, and M3 show a positive and significant impact, M2 has a significant negative influence, suggesting that the specific components of the money supply and how they interact are crucial for understanding their impact on the economy. Overall, these findings suggest that while broad liquidity can be beneficial, the composition of that liquidity is critical for promoting long-run economic growth in Nigeria.

Post-Estimation Test

Graph 1: Residual Diagnostic Test Result



The residual diagnostic test is conducted to assess the normality of the residuals from the FMOLS regression model. The histogram, along with the descriptive statistics and the Jarque-Bera test, provides evidence on whether the residuals are normally distributed, which is a key assumption for valid statistical inference. The residual series has a mean of -0.001718, which is very close to zero, indicating that the model is not systematically overestimating or underestimating the dependent variable. The median is -0.004763, and the standard deviation is 0.063923, suggesting a moderate spread around the mean, consistent with a stable regression model.

Also, the skewness value is 0.131900, indicating a slight positive skew. This suggests that the right tail of the distribution is marginally longer, but the value is close to zero, implying near-symmetry. The kurtosis value is 1.986115, which is less than the normal benchmark of 3. This

indicates that the distribution is platykurtic, meaning it has lighter tails and a flatter peak compared to a normal distribution. The Jarque-Bera statistic is 2.881076 with a probability value of 0.236800. Since this probability value is greater than the 5% significance level ($p > 0.05$), we fail to reject the null hypothesis of normality. This implies that the residuals are normally distributed. The overall result confirms that the FMOLS model is well-specified and that the estimates derived from it are reliable for policy inference and interpretation.

Discussion of Findings

The FMOLS result revealed that M1 has a positive and statistically significant impact on economic growth in Nigeria. This implies that increases in currency in circulation and demand deposits improve liquidity conditions, facilitate transactions, and stimulate productive economic activities. This finding is consistent with the monetarist proposition that an adequate supply of money enhances aggregate demand and output growth. Empirically, this finding agrees with Alfa *et al.* (2020), who found that currency in circulation positively and significantly affected RGDP in Nigeria, emphasizing the importance of liquidity in supporting economic activities, particularly in an economy with a large informal sector. The finding also supports Nkechi *et al.* (2026), who reported that money supply expansion promotes economic activities and employment generation through increased aggregate demand. However, the result contradicts the earlier expectation in the abstract that M1 may encourage consumption rather than productive investment, suggesting that during the study period, narrow money was effectively utilized to support economic growth.

The study further found that QM exerts a positive and statistically significant effect on economic growth in Nigeria. This indicates that savings deposits and time deposits are efficiently mobilized and channelled into productive investments through the banking system. This result is consistent with the McKinnon-Shaw Financial Liberalization Theory, which argues that financial deepening and savings mobilization enhance investment and economic growth. The finding also aligns with Ogunseni *et al.* (2026) and Loremba *et al.* (2022), who concluded that financial deepening and improved access to financial services positively influence economic growth by increasing resource mobilization and investment opportunities. The positive effect of quasi money therefore suggests an improvement in financial intermediation and the ability of the Nigerian financial system to transform savings into productive investments.

Contrary to theoretical expectations, the FMOLS estimation showed that M2 has a negative and statistically significant effect on economic growth in Nigeria. This suggests that increases in broad money supply may not necessarily translate into productive investments and could instead fuel inflationary pressures, speculative activities, or inefficient credit allocation. This finding contradicts several empirical studies. For example, Kazeem *et al.* (2024) found that M2 significantly promotes GDP growth in Nigeria. Similarly, Oseni and Oyelade (2023), Akujuobi and Chikezie (2022), and Opata and Obasikene (2021) reported a positive and significant relationship between broad money supply and economic growth. However, the result is consistent with Alfa *et al.*, (2020), who found that M2 had a significant negative effect on RGDP despite remaining an important predictor of economic activity. The finding also

supports Omodero (2019) and Olowookere *et al.* (2021), who reported insignificant or inverse relationships between broad money supply and economic growth in Nigeria. The negative impact of M2 therefore suggests that the issue in Nigeria may not be the quantity of money supply itself but rather the efficiency with which liquidity is allocated and transmitted to productive sectors of the economy.

The study found that M3 has a positive and statistically significant impact on economic growth in Nigeria. This implies that broader measures of liquidity, including large time deposits and institutional funds, contribute positively to long-term economic performance by supporting investment and financial deepening. This finding supports the theoretical argument of Tobin's Portfolio Theory (1969), which posits that broader monetary aggregates influence investment decisions and economic growth through wealth allocation channels. The result is also consistent with Udeh (2021) and Ogunseni *et al.* (2026), who found that financial deepening and broader access to financial resources promote sustainable economic growth. However, the finding contradicts Omodero (2019), who found that M3 had only an insignificant positive effect on Nigeria's economic growth. The positive contribution of M3 indicates that long-term and stable financial resources are more likely to be channelled into productive investments, thereby enhancing real sector performance.

Overall, the findings suggest that the relationship between money supply structure and economic growth in Nigeria is mixed and depends largely on the composition of monetary aggregates. While M1, QM, and M3 positively influence economic growth, M2 exerts a negative effect, indicating that simply increasing liquidity is insufficient to guarantee economic expansion. These findings generally support the Keynesian, Monetarist, and Financial Deepening theories, which emphasize the importance of money supply in stimulating economic activities. However, the negative effect of M2 highlights the argument by Ehikioya *et al.* (2022) and Ezeaku (2021) that the effectiveness of monetary expansion depends on the quality of financial intermediation, institutional efficiency, and the ability of the economy to channel liquidity into productive sectors.

Conclusion and Recommendations

This study examined the impact of the structure of money supply on economic growth in Nigeria using quarterly data from 2010Q1 to 2025Q4 and the FMOLS estimation technique. The findings revealed that M1, QM, and M3 exert positive and significant effects on economic growth, while M2 has a negative and significant effect on economic growth in Nigeria. The findings of this study partially agree and partially disagree with previous empirical studies. The positive effects of M1 and QM are consistent with studies such as Alfa *et al.* (2020), Ogunseni *et al.* (2026), and Loremba *et al.* (2022), which found that financial deepening and increased liquidity support economic growth. Similarly, the positive effect of M3 supports the findings of Udeh (2021). However, the negative impact of M2 contradicts the findings of Kazeem *et al.* (2024), Oseni and Oyelade (2023), and Opata and Obasikene (2021), who reported a positive relationship between broad money supply and economic growth. Nevertheless, the result agrees with Alfa *et al.* (2020) and Omodero (2019), who found that broad money supply may have a negative or insignificant effect on economic performance.

Overall, the study concludes that the effectiveness of money supply in promoting economic growth depends not merely on the volume of liquidity in the economy but on the composition and efficient allocation of monetary resources to productive sectors.

Therefore, the paper recommends the following:

- i). M1 positively and significantly affects economic growth, the Central Bank of Nigeria (CBN) should maintain adequate liquidity in the economy and strengthen payment systems to ensure that transactional balances continue to support productive economic activities.
- ii). Given the positive contribution of QM to economic growth, policies that encourage savings mobilisation and deepen financial intermediation should be strengthened to channel savings and time deposits into productive investments.
- iii). Considering the negative effect of M2 on economic growth, the CBN should ensure that increases in broad money supply are accompanied by improved credit allocation to productive sectors such as agriculture, manufacturing, and SMEs to prevent liquidity from fuelling inflation and speculative activities.
- iv). M3 positively influences economic growth, CBN, Ministry of Finance, Securities and Exchange Commission (SEC) should deepen financial markets, promote long-term deposits, and encourage the development of capital market instruments that can mobilise long-term funds for investment and sustainable economic growth.

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