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The Mediating Role of Aggregate Investment in Monetary Policy Transmission to Economic Growth in Nigeria

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Abstract – This study examines the role of aggregate investment in transmitting the effects of monetary policy to economic growth in Nigeria. Motivated by persistent weaknesses in monetary policy effectiveness in developing economies, the study explicitly models private and public investment as mediating channels linking monetary policy instruments to output growth. Using annual data spanning 1986–2024 and employing an Autoregressive Distributed Lag (ARDL)–Error Correction framework within the Baron and Kenny mediation approach, the study estimates the direct, indirect, and total effects of monetary policy on economic growth. The results reveal that monetary policy does not exert a robust direct effect on economic growth once investment is incorporated into the growth equation. Instead, monetary policy influences growth predominantly through aggregate investment, confirming the presence of indirect transmission. Private investment emerges as an effective and growth-enhancing channel, exhibiting a positive and significant short-run impact on economic growth. In contrast, public investment displays a negative short-run effect, reflecting structural inefficiencies, implementation lags, and weak complementarities with private sector activity. Among monetary policy instruments, money supply significantly shapes both private and public investment, while reserve requirements and exchange rate dynamics exert contractionary or weak effects depending on the horizon. These findings underscore that the effectiveness of monetary policy in Nigeria depends less on the stance of policy instruments and more on the quality and productivity of investment transmission. By explicitly integrating aggregate investment into the monetary policy–growth nexus, the study contributes novel, context-specific evidence for Sub-Saharan Africa and highlights the need for policy coordination that prioritizes private sector investment, financial intermediation efficiency, and institutional reforms to enhance growth outcomes.

Keywords: Monetary Policy, Aggregate Investment, Economic Growth, Mediation Analysis, Nigeria
JEL Classification: E52, E22, O40, C32

I. INTRODUCTION

Sustained economic growth in developing economies depends critically on the ability of macroeconomic policy to stimulate productive aggregate investment. Monetary policy, in particular, is expected to support growth by influencing credit conditions, borrowing costs, and financial stability, thereby shaping private and public investment decisions. In this context, aggregate investment constitutes a central transmission channel through which monetary policy affects real economic activity, employment creation, and structural transformation (Bernanke & Gertler, 1995; Mishkin, 2016).

In Nigeria, monetary policy has long been positioned as a key instrument for promoting non-inflationary growth and macroeconomic stability. The Central Bank of Nigeria (CBN) is mandated to regulate liquidity, ensure price stability, and support a sound financial system capable of mobilising savings for productive investment (CBN, 2015; Okanya, 2019). These objectives are reinforced in the National Development Plan (2021–2025), which explicitly recognises investment-led growth as essential for economic diversification and poverty reduction. Yet, despite repeated monetary policy interventions, Nigeria's growth trajectory has remained volatile, while aggregate investment has persistently lagged behind levels required for sustained development.

Nigeria's monetary policy framework has evolved substantially, shifting from a regime of direct controls to a predominantly market-based system. Prior to the Structural Adjustment Programme (SAP), policy relied on credit ceilings, administered interest rates, and selective credit allocation to guide investment toward priority sectors. While intended to stabilise the economy, these measures often resulted in financial repression and inefficient capital allocation. The adoption of SAP in the mid-1980s marked a transition toward indirect monetary instruments, including exchange rate liberalisation, Open Market Operations (OMO), and interest rate deregulation, with the aim of improving allocative efficiency and strengthening investment incentives (Sesay & Brima, 2017).

Since the early 2000s, Nigeria has operated a medium-term monetary policy framework centred on market-based instruments such as OMO, reserve requirements, and the Monetary Policy Rate (MPR). These tools are intended to influence liquidity conditions, credit availability, and investment behaviour, while maintaining price stability (Lawal et al., 2022; Iwedi et al., 2024). Despite these reforms, Nigeria continues to face persistent macroeconomic challenges, including inflation volatility, exchange rate instability, and recurrent fiscal pressures. These conditions have weakened investor confidence and constrained the responsiveness of aggregate investment to monetary policy signals.

From a development economics perspective, weak monetary transmission is often linked to structural and institutional constraints rather than policy design alone. In Nigeria, underdeveloped financial markets, high lending rates, limited access to formal credit, and the dominance of informal finance have reduced the effectiveness of interest rate and credit channels (Ugwuegbe & Uruakpa, 2013). Moreover, fiscal dominance, characterised by expansionary public spending and debt financing, has frequently undermined monetary policy autonomy, complicating efforts to stabilise inflation and stimulate investment (Ozili, 2024). An additional concern lies in the structure of financial intermediation. While Nigerian banks have remained profitable even during periods of economic stagnation, credit to productive sectors has been relatively subdued. This disconnect raises questions about whether financial institutions are effectively channelling monetary policy impulses into real investment or whether resources are diverted toward less productive or short-term activities (Adedeji, 2023). For firms, particularly small and medium-sized enterprises, high borrowing costs and policy uncertainty continue to constrain investment decisions, limiting the growth-enhancing potential of monetary policy.

Theoretically, the centrality of investment in the monetary transmission process is well established. Keynesian and monetarist traditions emphasise interest rate and credit channels, while post-Keynesian and endogenous money perspectives highlight the roles of expectations, uncertainty, and credit creation in shaping investment behaviour (Arestis & Sawyer, 2003). Across these frameworks, monetary policy influences economic growth primarily through its effect on aggregate investment rather than through direct output channels. However, in economies characterised by institutional weaknesses and macroeconomic instability, this mediation process may be fragile or incomplete.

Despite a substantial empirical literature on monetary policy and economic growth in Nigeria, most studies focus on direct policy–growth relationships, paying limited attention to the role of aggregate investment as an intervening mechanism. This gap restricts understanding of why monetary policy outcomes often fall short of expectations and limits the relevance of policy prescriptions. Without explicitly modelling investment as a mediating channel, it remains unclear whether weak growth responses reflect ineffective monetary policy or structural barriers that prevent policy impulses from translating into productive investment.

This study addresses this gap by examining the mediating role of aggregate investment in transmitting the effects of monetary policy to economic growth in Nigeria. By explicitly modelling aggregate investment as an intermediate channel, the study contributes to the development and African macroeconomic literature by clarifying the mechanisms through which monetary policy affects growth in a structurally constrained economy. The findings provide policy-relevant insights into how strengthening the investment channel can enhance the effectiveness of monetary policy in supporting sustainable and inclusive economic growth in Nigeria.

II. LITERATURE REVIEW

2.1 Conceptual Clarification

2.1.1 Monetary Policy

Monetary policy refers to the set of actions undertaken by a central bank to regulate liquidity, credit conditions, and the cost of funds to achieve macroeconomic objectives such as price stability, sustainable economic growth, and employment creation. In Nigeria, the Central Bank of Nigeria (CBN) defines monetary policy as the regulation of money supply, interest rates, and credit conditions to promote low inflation, financial stability, and long-run economic growth (CBN, 2024). These objectives align with standard central banking mandates

globally (Mishkin, 2016; Federal Reserve Bank of St. Louis, 2023).

Operationally, monetary policy is implemented through market-based instruments, notably the Monetary Policy Rate (MPR), Open Market Operations (OMO), and reserve requirements, which influence borrowing costs, credit availability, and financial conditions across the economy (BIS, 2021). In developing economies, monetary policy also plays a stabilisation role by influencing exchange rates, managing liquidity risks, and shaping expectations through policy communication (European Central Bank, 2023; IMF, 2023). However, the effectiveness of these instruments depends critically on financial market depth, institutional quality, and fiscal–monetary coordination.

In Nigeria, the transmission of monetary policy is often constrained by structural rigidities, fiscal dominance, and underdeveloped financial markets, which weaken the responsiveness of investment and output to policy signals (Ugwuegbe & Uruakpa, 2013; Ozili, 2024). Consistent with this study's focus, monetary policy is conceptualised not as an end in itself, but as a mechanism whose growth effects materialise primarily through intermediate channels, most notably aggregate investment. Accordingly, monetary policy in this study is proxied by the Monetary Policy Rate, Broad Money Supply (M2), and Cash Reserve Ratio, reflecting both price-based and quantity-based policy instruments.

2.1.2 Aggregate Investment

Aggregate investment represents total expenditure on capital goods by both the private and public sectors and constitutes the primary means through which an economy expands its productive capacity. It includes private investment, driven largely by profit expectations, interest rates, and business confidence and public investment, which focuses on infrastructure and long-term developmental objectives (Mankiw, 2022; Ofosu-Mensah et al., 2022). Together, these components contribute to capital accumulation, productivity enhancement, and employment generation. From a macroeconomic perspective, investment is defined as gross fixed capital formation, reflecting additions to the stock of physical capital such as machinery, equipment, buildings, and infrastructure (Agu, 2015; CBN, 2017). While private investment responds strongly to market signals and financial conditions, public investment often plays a complementary role by alleviating infrastructure bottlenecks and crowding in private sector activity (Ivashko et al., 2024). Both forms are sensitive to monetary conditions, particularly borrowing costs, credit availability, and macroeconomic stability.

Theoretical and empirical literature consistently identifies investment as the most volatile component of aggregate demand and the principal conduit through which monetary policy affects real economic activity (Bernanke & Gertler, 1995; Arestis & Sawyer, 2003). In this study, aggregate investment is conceptualised as a mediating variable that transmits monetary policy impulses to economic growth. It is operationally measured using Gross Fixed Capital Formation and government capital expenditure, capturing both private and public dimensions of capital accumulation.

2.1.3 Economic Growth

Economic growth refers to the sustained increase in an economy's capacity to produce goods and services over time and is conventionally measured by changes in real Gross Domestic Product (GDP). In development economics, growth is viewed not only as output expansion but as a process of structural transformation driven by capital accumulation, productivity improvements, and institutional development (Rodrik, 2013). Classical and modern growth theories alike emphasise the role of investment and factor productivity as core drivers of long-run growth (Smith, 1776; Solow, 1956; Romer, 1990). In empirical analysis, real GDP growth is preferred over nominal measures because it adjusts for inflation and more accurately reflects changes in real economic activity and living standards (IMF, 2009; Mankiw, 2022). For developing economies such as Nigeria, economic growth is particularly sensitive to macroeconomic stability, investment performance, and the effectiveness of policy transmission mechanisms.

Consistent with this literature, economic growth in this study is defined as the rate of change in real GDP, reflecting the expansion of productive capacity over time. By focusing on real GDP growth, the study captures the extent to which monetary policy, through its influence on aggregate investment, translates into sustained improvements in real economic performance.

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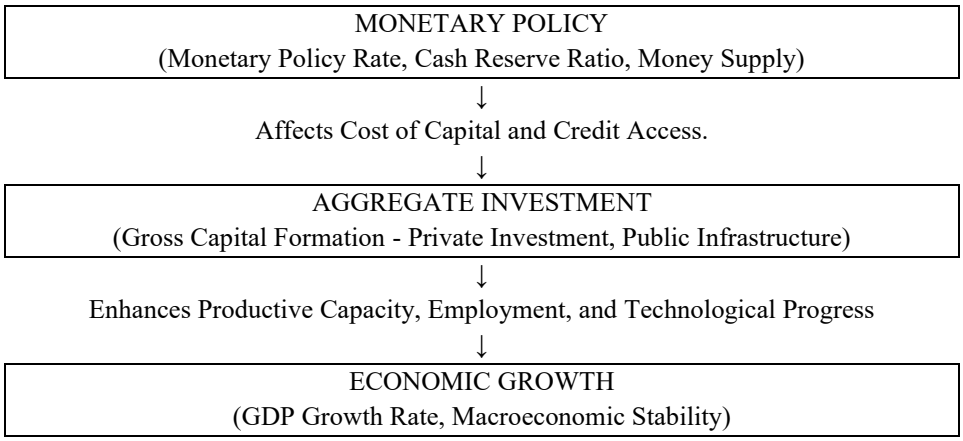
2.1.4 Conceptual Framework: Monetary Transmission and Mediation.

This study adopts a conceptual framework in which monetary policy influences economic growth indirectly through aggregate investment. Anchored in monetary transmission theory and neoclassical growth models, the framework posits that monetary policy instruments, such as interest rates, money supply, and inflation control, shape credit conditions, the cost of capital, and investor expectations within Nigeria's macroeconomic environment. Expansionary monetary policy enhances liquidity and lowers borrowing costs, while price stability strengthens investor confidence, collectively stimulating private and public investment. Aggregate investment in physical and human capital subsequently expands productive capacity, promotes employment, and supports technological progress, leading to higher output and sustained economic growth. The framework, therefore emphasizes aggregate investment as the key mediating channel through which monetary policy affects long-run economic performance.

Fig 1: Schematic Diagram of Monetary Policy Transmission Mechanism to Aggregate Investment and Economic Growth.



Source: Author, 2025

2.2 Theoretical Framework

The Monetarist Theory of Money, advanced by Milton Friedman, provides a foundational framework for analyzing the transmission of monetary policy to investment and economic growth. The theory posits that variations in the money supply are central to macroeconomic performance, influencing liquidity conditions, credit availability, investment decisions, price stability, and long-run output. Within this framework, monetary policy operates primarily through the control of money supply rather than discretionary fiscal or administrative interventions.

From a monetarist perspective, expansionary monetary policy increases liquidity in the financial system, lowering interest rates and easing credit constraints faced by firms. In Nigeria, the Central Bank employs instruments such as Open Market Operations, the Monetary Policy Rate, and cash reserve requirements to regulate money supply and credit conditions. When liquidity expands, financial institutions are better positioned to extend credit at lower borrowing costs, thereby stimulating aggregate investment. Monetarists argue that a steady and predictable growth in money supply is particularly effective in encouraging investment by reducing financing costs and minimizing uncertainty in financial markets.

Aggregate investment constitutes a critical transmission channel through which monetary policy influences economic growth. Monetarist theory emphasizes that investment responds strongly to changes in liquidity and credit conditions, with increased investment expanding productive capacity, raising output, and promoting long-term growth. This mechanism is especially relevant in the Nigerian economy, where high interest rates, limited access to credit, and macroeconomic instability have historically constrained investment. Stable monetary expansion, therefore, enhances investor confidence and creates an enabling environment for sustained private and public sector investment.

Finally, the Monetarist Theory underscores the importance of rule-based and credible monetary

policy for sustainable economic growth. Monetarists caution against frequent discretionary policy shifts, which can distort investment planning and undermine market confidence. Applied to Nigeria, this implies that monetary authorities should prioritize price stability, predictable monetary growth, and policy credibility. Such stability strengthens the effectiveness of the monetary transmission mechanism, allowing aggregate investment to effectively mediate the relationship between monetary policy and economic growth, thereby supporting long-term economic development.

2.3 Empirical Literature Review

The empirical literature on monetary policy transmission highlights substantial heterogeneity in how policy instruments influence investment and economic growth across countries, institutional settings, and financial structures. A recurring theme is that traditional monetary tools often transmit their effects imperfectly, particularly in developing economies where structural rigidities and financial market imperfections weaken policy effectiveness.

Using a data-rich Factor-Augmented VAR (FAVAR) approach, Yemba et al. (2024) examine the effectiveness of monetary policy in China between 2007 and 2021. Their findings indicate that the Divisia monetary aggregate (DMA2), which accounts for both money supply and user cost, exerts stronger and more consistent effects on output and prices than conventional instruments such as interest rates, simple monetary aggregates, and reserve requirements. Notably, some traditional instruments produced responses inconsistent with standard theory, raising questions about the adequacy of narrow policy measures. While this study contributes to the literature on alternative monetary aggregates, its focus on a single advanced emerging economy and the absence of an explicit investment transmission channel limit its applicability to developing economies such as Nigeria.

The growing role of financial innovation in reshaping monetary transmission is explored by Hasan et al. (2024), who analyze how FinTech adoption modifies the effectiveness of monetary policy using an interacted panel VAR framework over the period 1989–2018. Their results suggest that higher FinTech penetration generally weakens the response of output, prices, and housing to monetary policy shocks, with the strongest attenuation observed in bank loan growth. The authors attribute this outcome to relaxed financing constraints, regulatory arbitrage, and increased financial sector competition. Despite its relevance, the study abstracts from country-specific macroeconomic dynamics and does not incorporate real investment as a mediating variable, leaving unresolved how monetary policy ultimately influences growth in developing economies.

Firm-level evidence on monetary transmission is provided by Finnegan and Kapoor (2023), who investigate the impact of the European Central Bank's unconventional monetary policies on SME access to finance in crisis-affected Eurozone countries between 2014 and 2019. Their panel regression results show that while unconventional policies improved aggregate funding conditions, highly leveraged, small, and young firms continued to face binding credit constraints. These findings underscore the uneven transmission of monetary policy to investment at the firm level. However, the limited time horizon and focus on advanced economies constrain the study's relevance for long-run growth dynamics in developing countries.

In the Nigerian context, Anthony-Orji, Ogbuabor, and Uka (2023) examine the relationship between financial development, financial inclusion, and economic growth from 1981 to 2019 using a classical regression framework. Their results reveal that both financial development and inclusion exert significant positive effects on economic growth, highlighting the importance of efficient financial intermediation. While informative, the study does not explicitly model monetary policy dynamics nor the role of investment as a transmission mechanism, thereby offering only partial insights into the policy–growth nexus.

Using a Keynesian DSGE framework, Peykani et al. (2023) analyze the effects of monetary policy on Iran's real economy between 1990 and 2020. Their results show that contractionary monetary policy reduces firm activity and household income, weakens bank balance sheets, and constrains credit supply, thereby amplifying adverse investment effects. Although the model effectively captures credit and balance-sheet channels, its restrictive variable set and country-specific focus limit broader generalization, particularly for Sub-Saharan African economies.

Evidence from Southeast Asia is provided by Angelina and Nugraha (2020), who investigate

monetary policy, investment, and economic dynamics in Indonesia using a simultaneous equations model estimated via Two-Stage Least Squares. Their findings indicate that money supply growth and exchange rate depreciation significantly increase inflation, while higher policy interest rates reduce price pressures. More importantly, both domestic and foreign investment exert strong positive effects on economic growth, whereas inflation does not significantly influence output. These results reinforce the central role of investment in driving growth. However, the exclusion of key monetary instruments such as reserve requirements and lending rates weakens the policy relevance of the study.

Cross-country evidence from Younsi and Nafla (2019) further emphasizes the interconnectedness of monetary policy, financial stability, and economic growth across 40 developed and developing countries between 1993 and 2015. Their panel regression results show that trade openness, capital account openness, and foreign direct investment positively affect growth, while inflation, financial crises, low bank reserves, and high nonperforming loans exert negative effects. Although the study provides valuable macro-level insights, its panel structure masks country-specific transmission mechanisms and does not isolate investment as an explicit mediating channel.

Focusing on Nigeria, Okafor (2020) examines the effects of monetary policy instruments on domestic investment between 1970 and 2018 and finds that past private investment and bank credit significantly influence current investment, whereas narrow money supply and other policy instruments exhibit weak effects. A key limitation of this study is its failure to link investment outcomes to economic growth, resulting in an incomplete assessment of monetary policy effectiveness.

Similarly, Okeke and Awogbemi (2020) apply an ARDL framework to analyze the relationship between interest rates, money supply, domestic investment, and economic growth in Nigeria from 1980 to 2016. Their results indicate unstable and inconsistent effects of monetary policy on investment in both the short and long run, attributing low investment levels to policy inconsistency. However, the single-equation approach does not adequately capture the dynamic interdependencies among monetary policy, investment, and growth.

Overall, the existing literature reveals three major gaps. First, many studies focus on advanced or non-African economies, limiting their relevance for Nigeria. Second, most Nigerian studies examine either monetary policy–investment or monetary policy–growth linkages in isolation, without explicitly modelling investment as a transmission mechanism. Third, several studies rely on restrictive methodologies or outdated datasets. This study addresses these gaps by explicitly examining the mediating role of aggregate investment in transmitting the effects of monetary policy to economic growth in Nigeria, using an ARDL–ECM framework and updated annual data spanning 1986–2024. By integrating key monetary policy instruments with aggregate investment and growth dynamics, the study provides context-specific evidence on the effectiveness of monetary policy transmission in a developing economy, thereby contributing to the empirical literature on monetary policy and growth in Sub-Saharan Africa.

III. METHODOLOGY

3.1 Research Design and Approach

This study employs a quantitative research design, grounded in a time series econometric framework, to investigate the relationship between monetary policy, aggregate investment (disaggregated into public and private investment), and economic growth in Nigeria. The research is explanatory in nature, seeking to uncover the causal pathways through which monetary policy influences investment and, in turn, how investment contributes to economic growth. Given the dynamic and temporal nature of the macroeconomic variables under study, such as monetary policy rates, money supply, cash reserve ratio, exchange rate, investment levels, and GDP, a time series approach is appropriate for capturing both short-term adjustments and long-term equilibrium relationships.

3.2 Model Specification

This model investigates whether public and private investment serve as distinct mediating channels through which monetary policy affects economic growth in Nigeria. Expanding on the classical Baron and Kenny (1986) mediation framework, this study disaggregates aggregate investment into its public and private components to better capture the heterogeneous transmission mechanisms of monetary policy within a time series econometric context.

Mediation Framework with Disaggregated Investment Channels

The analysis proceeds in four regression stages, with investment decomposed into public investment (PU_INV) and private investment (PR_INV).

Equation 1: Direct Effect of Monetary Policy on Economic Growth

$$GDPGR_t = \alpha_0 + \alpha_1 MPR_t + \alpha_2 \ln(MS_t) + \alpha_3 CRR_t + \alpha_4 EXR_t + u_t$$

This equation estimates the total (direct) effect of monetary policy instruments on economic growth.

Equation 2a: Effect of Monetary Policy on Public Investment (First Mediator)

$$\ln(PU\_INV_t) = \beta_0 + \beta_1 MPR_t + \beta_2 \ln(MS_t) + \beta_3 CRR_t + \beta_4 EXR_t + v_t$$

This equation evaluates the effect of monetary policy on public investment.

Equation 2b: Effect of Monetary Policy on Private Investment (Second Mediator)

$$\ln(PR\_INV_t) = \beta_0 + \beta_1 MPR_t + \beta_2 \ln(MS_t) + \beta_3 CRR_t + \beta_4 EXR_t + w_t$$

This equation captures how monetary policy influences private investment.

Equation 3: Full Mediation Model with Public and Private Investment

$$GDPGR_t = \gamma_0 + \gamma_1 MPR_t + \gamma_2 \ln(MS_t) + \gamma_3 CRR_t + \gamma_4 (PU\_INV_t) + \gamma_5 \ln(PR\_INV_t) + \gamma_6 EXR_t + e_t$$

In this final model, both public and private investment are included to evaluate their joint mediating effects. A reduction in the magnitude or significance of the monetary policy coefficients (e.g., MPR, M2, CRR) relative to Equation 1, along with significant coefficients for PU_INV and PR_INV, would indicate that both investment channels play mediating roles.

Mediation Conditions (Baron & Kenny, 1986, Adapted)

For public and/or private investment to serve as mediators:

1. Monetary policy variables must significantly affect economic growth (Equation 1).
2. Monetary policy must significantly affect public and/or private investment (Equations 2a & 2b).
3. Public and/or private investment must significantly affect growth (Equation 3), and;
4. the direct coefficients of monetary policy instruments must decline in magnitude or lose significance when mediators are included.

This decomposition allows for richer insights into how monetary policy differently influences growth through government-led versus market-driven investment channels.

3.3 Nature and Sources of Data

The study is based on an ex-post facto design. The annual data on all variables were sourced from the CBN Statistical Bulletin, WGI and WDI (2023). The period covered is 39 years (1986 to 2024). The scope started from 1986 to reflect only the market-based economic conditions in the study. The variables used in the study include GDP growth rate (GDPGR), Cash Reserve Ratio (CRR), Money Supply (M2), Monetary Policy Rate (MPR), Exchange Rate (EXR), Private Investment (PR_INV), Public Investment (PU_INV), Political Stability and Absence of Violence (PS) and Rule of Law (RL). The variables are further discussed in Table 3.1.

Table 3.1: Description of Variables

Variable	Label	Description	Measurement / Unit	Source	Expected Sign
GDP Growth Rate	GDPGR	Annual percentage change in real Gross Domestic Product	% Annual change	World Bank (WDI)	Dependent Variable
Cash Reserve Ratio	CRR	Mandatory reserves held by commercial banks with the central bank	% of total deposits	CBN Statistical Bulletin	±
Monetary Policy Rate	MPR	Benchmark interest rate set by the Central Bank of Nigeria	% Per annum	CBN Statistical Bulletin	–

Variable	Label	Description	Measurement / Unit	Source	Expected Sign
Exchange Rate	EXR	Official exchange rate of the naira against the US dollar	Naira/USD	CBN Statistical Bulletin	±
Money Supply	M2	Total quantity of money in circulation, including narrow money and demand deposits	Billion Naira	CBN Statistical Bulletin	±
Private Investment	PR_INV	Gross Fixed Capital Formation from the private sector	Constant 2015 USD (millions)	World Bank (WDI)	+
Public Investment	PU_INV	Government capital expenditure	Billion Naira	CBN Statistical Bulletin	+

Notes: In Nigeria, monetary policy could generally affect the level of investment financing through the following mechanisms: (1) controlling the amount of money in circulation through lending activities; (2) using monetary policy rates to influence the cost of capital in the economy and the ability to borrow or deposit, thereby impacting the level of corporate spending and investment

IV. RESULT PRESENTATION AND DISCUSSION

4.1 Descriptive Statistics

Table 1: Result of Descriptive Statistics

	GDPGR	CRR	M2	MPR	EXR	PR_INV	PU_INV
Mean	4.159	11.33	8043	13.80	182.0	4.8E+15	729.9
Median	4.099	8.600	2637	13.50	127.4	5.4E+15	498.0
Maximum	15.32	32.50	2.2E+04	26.00	1483	8.0E+15	3090
Minimum	-2.035	1.000	23.81	6.000	2.020	7.3E+13	5.465
Std. Dev.	3.751	9.112	8716	3.738	263.3	2.3E+15	808.0
Skewness	0.532	0.756	0.521	0.704	3.468	-1.022	1.448
Kurtosis	3.648	2.300	1.545	4.771	16.87	2.945	4.388
Jarque-Bera	2.522	4.514	5.204	8.319	390.6	6.796	16.76
Probability	0.283	0.105	0.074	0.016	0.000	0.033	0.000
Sum	162.2	442.0	3.1 E+05	538.4	7098	1.9E+17	2.8E+04
Sum Sq. Dev.	534.7	3155	2.9E+09	530.9	2.6E+06	1.9E+32	2.4E+07
Observations	39	39	39	39	39	39	39

Source; Authors computation 2025

Table 4.1 presents the descriptive statistics of the variables used in the study, providing insights into Nigeria's macroeconomic and investment dynamics over the sample period. The average GDP growth rate is 4.16%, indicating moderate long-run economic performance, though the wide dispersion between peak growth and contraction reflects substantial macroeconomic volatility. The standard deviation confirms pronounced fluctuations in output growth, consistent with exposure to oil price shocks and policy-induced instability. The near-normal distribution of GDP growth suggests balanced growth dynamics around the mean.

Monetary policy indicators display significant variability. The cash reserve ratio averages 11.33%, with large fluctuations reflecting episodes of aggressive liquidity tightening by the Central Bank. Similarly, the monetary policy rate averages 13.80%, indicating a generally restrictive stance, though its wide range and non-normal distribution suggest abrupt policy adjustments in response to

macroeconomic conditions. The exchange rate exhibits extreme volatility, characterized by sharp depreciation episodes and high skewness, underscoring persistent external sector pressures and regime shifts in Nigeria's foreign exchange management.

Investment variables reveal pronounced asymmetries. Private investment records a relatively high mean but displays negative skewness, indicating that while investment levels are generally elevated, there are occasional sharp contractions. Public investment, by contrast, is highly volatile and positively skewed, reflecting episodic surges in government capital spending associated with fiscal cycles and accommodative monetary conditions. Overall, the descriptive statistics highlight substantial macroeconomic instability and investment volatility in Nigeria, reinforcing the relevance of examining monetary policy transmission through aggregate investment.

4.2 Test of Stationarity

To determine the stationarity properties of the variables used in the model, both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were employed. These tests are essential to avoid spurious regression results and to guide the appropriate econometric technique in this case, the ARDL approach, which requires that variables be integrated of order zero, I(0), or order one, I(1), but not I(2). The ADF and PP tests for both levels and the first difference are presented in the Table 2.

Table 2: Result of Unit Root Tests

	ADF				PP				
Variable	Level		1st Diff		Level		1st Diff		Remarks
	Stat.	P-Value	Stat.	P-Value	Stat.	P-Value	Stat.	P-Value	
GDPGR	-4.16 [a]	0.00	-	-	-4.07 [a]	0.00	-	-	I(0)
CRR	0.54	0.99	-5.87[a]	0.00	0.28	0.97	-6.03 [a]	0.00	I(1)
LnM2	1.79	1.00	-4.47 [a]	0.00	0.07	0.99	-6.42 [a]	0.00	I(1)
MPR	-3.25 [b]	0.03	-	-	-3.31 [b]	0.02	-	-	I(0)
LnEXR	-2.72	0.24	-5.82 [a]	0.00	-1.47	0.54	-5.82 [a]	0.00	I(1)
LnPR_INV	2.26	1.00	-12.9 [a]	0.00	4.89	1.00	-3.91 [b]	0.02	I(1)
LnPU_INV	-2.00	0.29	-7.18 [a]	0.00	-2.21	0.21	-7.12 [a]	0.00	I(1)

Note: the ADF and PP critical values at 1%, 5% and 10% are -3.621, -2.943 and -2.610 respectively. a, b and c indicate that the statistics are significant at 1%, 5% and 10% level of significance respectively.

Table 4.2 reports the unit root test results based on the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) procedures. These tests were conducted to determine the stationarity properties of the variables and to avoid spurious regression results. The null hypothesis of a unit root was tested at level and first difference. The results indicate a mixed order of integration. GDP growth rate (GDPGR), and monetary policy rate (MPR), are stationary at level, implying they are I(0). In contrast, the cash reserve ratio, money supply, exchange rate, public and private investment, are non-stationary at level but become stationary after first differencing, indicating they are I(1). Importantly, none of the variables is integrated of order two, confirming the suitability of the dataset for cointegration analysis and the application of the ARDL framework. Overall, the stationarity results provide a sound econometric basis for examining both the short-run and long-run relationships among monetary policy, investment, and economic growth in Nigeria.

4.3 Cointegration Test

The cointegration test enables us to determine whether a long-run equilibrium relationship exists among two or more non-stationary time series variables. It examines if a linear combination of these variables is stationary, implying that the variables move together over time despite short-term fluctuations. This concept is essential in econometrics, especially when analyzing economic and financial variables that are integrated of the same order, as it helps identify meaningful long-term

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relationships for model estimation and policy analysis.

Table 3: Result of ARDL Bounds Cointegration Test

F-Bounds Test			Null Hypothesis: No levels relationship		
Test Statistic	K	F-statistic Value	Signifcance	I(0)	I(1)
				Asymptotic: n=1000	
Model 1	4	4.682	10%	1.99	2.94
Model 2a	4	8.494	5%	2.27	3.28
Model 2b	4	3.538	2.50%	2.55	3.61
Model 3	6	6.250	1%	2.88	3.99

The ARDL Bounds test result shows that the F-statistics are above the 5% upper bound critical value of 3.28. This indicates that we reject the null hypothesis of no long-run relationship. This implies that there is strong evidence of cointegration, confirming a long-run relationship between the variables in Nigeria. This validates the use of the ARDL model for further analysis.

4.4 ARDL Estimates

This section investigates whether aggregate investment mediates the relationship between monetary policy and economic growth in Nigeria, drawing on the mediation framework of Baron and Kenny (1986). The underlying hypothesis is that monetary policy influences economic growth indirectly by first affecting investment decisions, which subsequently drive output expansion. To test this, three regression models are estimated: (i) the direct effect of monetary policy on economic growth, (ii) the impact of monetary policy on aggregate investment, and (iii) the effect of aggregate investment on economic growth while controlling for monetary policy instruments. Together, these models assess the significance and strength of the investment channel in Nigeria's monetary policy transmission process.

Model One: Direct Effect of Monetary Policy on Economic Growth

Table 4.7.a: Result of Long and Short Run Direct impact of Monetary policy on Economic Growth

Dependent Variable: Economic Growth (GDPGR)				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
Long-Run				
CRR	-0.135	0.164	-0.824	0.418
LnMS	-2.584**	1.220	-2.118	0.045
MPR	-0.433	0.328	-1.319	0.200
LnEXR	3.741**	1.548	2.416	0.024
Short-Run				
D(CRR)	-0.120	0.154	-0.781	0.443
D(LnMS)	-2.303**	1.033	-2.229	0.019
D(MPR)	-0.386	0.252	-1.533	0.139
D(LnEXR)	-2.663**	1.182	-2.254	0.034
CointEq(-1)*	-0.891***	0.113	-7.889	0.000

*Note: ***, ** and * indicate that the coefficients are significant at 1%, 5% and 10% levels of significance respectively. (.) indicates P-value*

Table 4.7.a reports the ARDL estimates of the direct long- and short-run effects of monetary policy instruments on Nigeria's economic growth. The model captures the pure impact of Cash Reserve Ratio (CRR), money supply (LnMS), Monetary Policy Rate (MPR), and exchange rate (LnEXR) without additional controls.

In the long run, CRR and MPR exert negative but statistically insignificant effects on economic growth, indicating weak credit and interest rate transmission

mechanisms. In contrast, money supply shows a negative and significant effect, suggesting that monetary expansion has been largely growth-inhibiting due to inflationary pressures, exchange rate instability, and inefficient credit allocation. The exchange rate exhibits a positive and significant effect, implying that currency depreciation supports long-run growth through improved export competitiveness and import substitution.

Short-run effects remain asymmetric. Changes in CRR and MPR are negative but insignificant, reaffirming the limited short-term effectiveness of these instruments. Money supply shocks exert a significant contractionary effect on output, reflecting immediate inflationary and macroeconomic pressures. Exchange rate depreciation reduces growth in the short run, highlighting adjustment costs associated with higher import prices and production costs.

The error correction term is negative and highly significant, confirming a stable long-run relationship among the variables, with approximately 89% of short-run disequilibrium corrected within one period.

Model Two: Effect of Monetary Policy on Aggregate Investment (Mediator)

Table 4.7.bi: Result of Long and Short Run Direct impact of Monetary policy on Private Investment

Dependent Variable: Private Investment (PR_INV)				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
Long-Run				
CRR	-0.382**	0.084	-4.538	0.011
LnMS	3.019***	0.498	6.069	0.004
MPR	0.482*	0.178	2.709	0.054
LnEXR	-1.579***	0.323	-4.896	0.008
Short-Run				
D(CRR)	-0.321***	0.042	-7.575	0.002
D(LnMS)	21.12***	1.973	10.70	0.000
D(MPR)	0.338***	0.041	8.183	0.001
D(LnEXR)	-0.052	0.372	-0.140	0.896
CointEq(-1)*	-3.271***	0.257	-12.74	0.000

*Note: ***, ** and * indicate that the coefficients are significant at 1%, 5% and 10% levels of significance respectively. (.) indicates P-value*

Table 4.7.bi presents ARDL estimates of the direct long- and short-run effects of monetary policy instruments on private investment in Nigeria. In the long run, the Cash Reserve Ratio (CRR) exerts a negative and significant effect, indicating that higher reserve requirements constrain bank lending and discourage private investment. In contrast, money supply has a positive and highly significant impact, suggesting that improved liquidity conditions enhance credit access and support sustained private capital formation. The Monetary Policy Rate shows a weakly positive effect, reflecting Nigeria's macro-financial structure where tighter policy may signal stability and improve investor confidence. Exchange rate depreciation negatively and significantly affects private investment, underscoring the economy's dependence on imported capital goods and vulnerability to currency instability.

Short-run results indicate stronger transmission effects. CRR continues to significantly suppress private investment, while money supply exerts a large and positive effect, highlighting the immediate role of liquidity in easing financing constraints. The Monetary Policy Rate also shows a positive and significant short-run impact, whereas exchange rate movements remain insignificant, suggesting that firms respond more to persistent rather than transitory exchange rate changes. The error correction term is negative and highly significant, confirming a stable long-run relationship with rapid adjustment following monetary shocks.

Overall, the results indicate that monetary policy exerts a stronger and more direct influence on private investment than on economic growth in Nigeria, with

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liquidity conditions, reserve requirements, and exchange rate stability playing dominant roles.

Table 4.7.bii: Result of Long and Short Run Direct impact of Monetary policy on Public Investment

Dependent Variable: Public Investment (PU_INV)				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
Long-Run				
CRR	-0.081*	0.044	-1.848	0.079
LnMS	1.546**	0.590	2.622	0.016
MPR	-0.072	0.048	-1.502	0.149
LnEXR	0.248	0.387	0.641	0.529
Short-Run				
D(CRR)	0.008	0.014	0.607	0.551
D(LnMS)	1.663***	0.226	7.369	0.000
D(MPR)	-0.034	0.022	-1.595	0.126
D(LnEXR)	0.120	0.210	0.571	0.575
CointEq(-1)*	-0.482***	0.078	-6.210	0.000

*Note: ***, ** and * indicate that the coefficients are significant at 1%, 5% and 10% levels of significance respectively. (.) indicates P-value*

Table 4.7.bii reports the ARDL estimates of the direct long- and short-run effects of monetary policy instruments on public investment in Nigeria. In the long run, the Cash Reserve Ratio (CRR) exerts a weakly negative effect, suggesting that higher reserve requirements slightly constrain public investment, possibly through higher domestic borrowing costs. Money supply has a positive and significant effect, indicating that liquidity expansion enhances fiscal space and supports government capital expenditure. In contrast, the Monetary Policy Rate and exchange rate exhibit insignificant long-run effects, reflecting the limited sensitivity of public investment to market-based monetary conditions.

Short-run results show similarly weak transmission, except for money supply, which exerts a strong and significant positive effect on public investment. Changes in CRR, interest rates, and the exchange rate do not significantly influence public investment in the short run, underscoring the dominance of fiscal and institutional factors in public investment decisions. The error correction term is negative and significant, confirming a stable long-run relationship with moderate adjustment toward equilibrium.

Overall, the results indicate that money supply is the most effective monetary policy instrument for influencing public investment in Nigeria, while interest rate and exchange rate channels remain largely ineffective.

Model Three: Effect of Monetary Policy and Investment on Growth (Full Mediation Model)

Table 4.7.c: Result of Long and Short run on the combined impact of Monetary policy and Aggregate Investment on Economic Growth

Dependent Variable: Economic Growth (GDPGR)				
Variable	Coefficient	Std. Error	t-Statistic	P-Value
Long-Run				
CRR	-0.222	0.219	-1.016	0.323
LNMS	-1.287	1.945	-0.662	0.517
MPR	-0.819	0.567	-1.445	0.166
LNEXR	2.782	2.135	1.303	0.209
LNPR_INV	1.087	1.342	0.810	0.429
LNPU_INV	1.056	2.375	0.445	0.662

Short-Run				
D(CRR)	-0.168	0.185	-0.909	0.375
D(LnMS)	-0.971	1.477	-0.658	0.519
D(MPR)	-0.618*	0.307	-2.017	0.059
D(LnEXR)	-3.029**	1.261	-2.403	0.027
D(LnPR_INV)	1.023***	0.274	3.726	0.002
D(LnPU_INV)	-3.269**	1.169	-2.797	0.012
CointEq(-1)*	-0.755***	0.083	-9.123	0.000

*Note: ***, ** and * indicate that the coefficients are significant at 1%, 5% and 10% levels of significance, respectively. (.) indicates P-value*

Table 4.7.c reports the full mediation model examining the joint effects of monetary policy instruments and aggregate investment on economic growth in Nigeria. In the long run, neither monetary policy variables nor investment measures exert statistically significant direct effects on GDP growth, indicating that monetary policy influences growth mainly through indirect transmission mechanisms. The coefficients on CRR, money supply, MPR, and exchange rate are all insignificant, suggesting weak direct policy–growth linkages once investment is explicitly incorporated. Similarly, both private and public investment display positive but insignificant long-run coefficients, implying that their independent growth effects diminish within the full mediation framework.

Short-run dynamics are more informative. Changes in CRR and money supply remain insignificant, while the monetary policy rate has a weakly negative effect on growth, reflecting the contractionary impact of higher interest rates. Exchange rate depreciation exerts a significant negative short-run effect, likely operating through higher import costs and reduced productive efficiency. Private investment emerges as the dominant transmission channel, with a positive and highly significant short-run impact on economic growth, confirming its central mediating role. In contrast, public investment has a significant negative short-run effect, possibly due to crowding-out effects, implementation lags, or fiscal inefficiencies.

The error correction term is negative and highly significant, confirming a stable long-run equilibrium relationship and indicating rapid adjustment of short-run deviations toward equilibrium. Overall, the results highlight the predominance of indirect monetary policy transmission to growth through investment, particularly private investment, in Nigeria.

4.5 Diagnostic and Robustness Tests

To ensure the validity of the model estimates, a series of diagnostic tests was performed. These include the Breusch-Godfrey LM test for serial correlation, the Breusch-Pagan-Godfrey test for heteroskedasticity, and the CUSUM and CUSUMSQ tests for parameter stability over time. The results of these tests confirm that the model is free from serial correlation and heteroskedasticity, and that the estimated parameters remain stable throughout the sample period.

4.6 Discussion of Findings

The mediation analysis, grounded in the Baron and Kenny (1986) framework and estimated using Tables 4.7a, 4.7bi, 4.7bii, and 4.7c, provides strong evidence that aggregate investment constitutes a central channel through which monetary policy influences economic growth in Nigeria. Rather than operating directly on output, monetary policy affects growth primarily by shaping private and public investment decisions, with asymmetric growth implications. This finding is consistent with the broader empirical literature which emphasizes that monetary policy transmission in developing economies is often indirect and mediated through real-sector variables such as investment rather than through direct policy–output linkages (Angelina & Nugraha, 2020; Younsi & Nafla, 2019).

The first mediation condition is satisfied, as monetary policy significantly affects economic growth. Results from Table 4.7a show that money supply exerts a statistically significant negative effect on GDP growth in both the short and long run, while the exchange rate has a positive and significant long-run effect. The adverse growth impact of monetary expansion suggests weak absorptive capacity in productive sectors, with excess liquidity likely translating into inflationary pressures, speculative activity, or macroeconomic instability rather than real

output expansion. This outcome aligns with evidence from Nigeria and other developing economies showing that monetary expansion often fails to stimulate growth when financial intermediation is weak and credit allocation is inefficient (Okeke & Awogbemi, 2020; Okafor, 2020). Similar inconsistencies in the growth effects of conventional monetary aggregates have also been documented in emerging and advanced economies, where traditional instruments sometimes generate responses that deviate from theoretical expectations (Yemba et al., 2024).

The second mediation condition is also met, as monetary policy significantly influences aggregate investment through both its private and public components. For private investment (Table 4.7bi), money supply strongly stimulates investment in the short and long run, reflecting liquidity and credit availability effects, while CRR and MPR exert contractionary influences by tightening financing conditions. These results confirm that private investment responds sensitively to monetary policy via credit, liquidity, and expectations channels, consistent with firm-level and macro-level evidence showing that monetary tightening constrains investment by worsening credit conditions and balance-sheet positions (Finnegan & Kapoor, 2023; Peykani et al., 2023). In the Nigerian context, this finding corroborates earlier studies that identify bank credit availability and past investment dynamics as key drivers of private investment (Okafor, 2020).

Public investment (Table 4.7bii) is likewise affected by monetary policy, particularly through money supply and CRR in the long run, with money supply also exerting a significant short-run effect. This indicates that monetary policy shapes public capital spending indirectly through system-wide liquidity conditions, government borrowing costs, and financial sector intermediation. The result complements cross-country evidence that highlights the sensitivity of public investment to financial conditions and fiscal financing constraints, even though the growth implications of such investment may differ substantially across institutional settings (Younsi & Nafla, 2019). It also resonates with Nigerian evidence showing that public sector financing is influenced by monetary conditions but constrained by institutional rigidities (Anthony-Orji et al., 2023).

The third mediation condition requires that investment significantly affects economic growth when included alongside monetary policy variables. The results in Table 4.7c provide partial but important confirmation. Private investment exerts a positive and highly significant short-run effect on economic growth, underscoring its role as an efficient conduit through which monetary impulses translate into capital accumulation, productivity gains, and output growth. This finding is consistent with the investment-led growth hypothesis documented in Indonesia and other developing economies, where both domestic and private investment are found to be key drivers of output growth (Angelina & Nugraha, 2020). It also supports the argument that the effectiveness of monetary policy ultimately depends on its ability to stimulate productive private sector investment rather than on direct policy manipulation of aggregate demand.

By contrast, public investment displays a significant negative short-run effect on growth. This suggests that public capital spending may initially crowd out private activity or suffer from implementation lags and efficiency losses. Structural weaknesses, such as poor project selection, governance failures, cost overruns, and weak complementarities with private investment, appear to limit the growth payoff of public investment, even when it is responsive to monetary conditions. This result aligns with evidence from developing economies where public investment is often associated with low productivity and limited growth impact due to institutional inefficiencies (Younsi & Nafla, 2019), and it helps explain why increases in public spending do not automatically translate into higher output in Nigeria.

The final mediation condition is satisfied by the marked attenuation of the direct effects of monetary policy variables once investment is introduced into the growth equation. In particular, money supply, which is statistically significant in the baseline growth model, becomes insignificant in the full mediation model. This reduction in both magnitude and significance confirms that monetary policy influences economic growth predominantly through aggregate investment rather than through direct channels, consistent with findings that emphasize weak direct monetary transmission in the presence of financial market imperfections (Okeke & Awogbemi, 2020; Hasan et al., 2024).

Overall, the findings demonstrate that aggregate investment is a critical transmission mechanism linking monetary policy to economic growth in Nigeria, though its components operate asymmetrically. Private investment serves as an effective and growth-enhancing channel, while public investment mediates monetary policy effects weakly or negatively due to institutional and efficiency constraints. Consequently, the effectiveness of monetary policy in Nigeria depends less on the stance of policy instruments and more on the quality, efficiency, and sectoral allocation of investment, particularly within the private sector. This evidence contributes to the empirical literature by explicitly validating investment-based transmission mechanisms in a Sub-Saharan African context, where monetary policy effectiveness is often constrained by structural and institutional factors.

V. CONCLUSION AND RECOMMENDATIONS

This study investigated the mediating role of aggregate investment in transmitting the effects of monetary policy to economic growth in Nigeria, using a mediation framework grounded in monetary transmission theory and estimated within an ARDL setting. The empirical evidence demonstrates that monetary policy influences economic growth in Nigeria primarily through investment channels rather than through direct policy–growth linkages. Once private and public investment are explicitly incorporated into the growth equation, the direct effects of key monetary policy instruments, particularly money supply, become statistically insignificant, confirming that investment plays a dominant mediating role in the monetary policy–growth nexus.

The results further reveal strong asymmetries in how different components of aggregate investment transmit monetary impulses to economic growth. Private investment emerges as a robust and growth-enhancing channel, responding sensitively to monetary conditions and translating liquidity and credit effects into short-run output expansion through capital accumulation, productivity gains, and employment creation. In contrast, public investment exhibits weak or negative short-run growth effects, suggesting that increases in government capital spending do not automatically translate into productive capacity expansion. This outcome points to structural and institutional deficiencies, such as weak project selection, implementation delays, cost overruns, and limited complementarities with private sector activity, that undermine the growth effectiveness of public investment in Nigeria.

These findings imply that the effectiveness of monetary policy in Nigeria depends less on the stance or intensity of policy instruments and more on the quality and efficiency of the investment transmission process. While monetary policy significantly shapes both private and public investment decisions, only private investment consistently converts monetary impulses into growth-enhancing outcomes. Monetary expansion, in particular, exerts limited direct influence on economic growth and may even generate adverse effects when liquidity is inefficiently allocated or diverted toward inflationary and speculative activities rather than productive investment.

From a policy perspective, the results suggest that monetary authorities should prioritise policies that strengthen private investment as the principal conduit of monetary transmission. Enhancing credit availability to productive sectors, improving liquidity conditions for firms, and lowering structural financing constraints are likely to yield stronger growth dividends than broad-based monetary expansion. At the same time, caution is warranted in the use of money supply growth as a growth-stimulating tool, given its weak direct impact on output and its potential to exacerbate macroeconomic instability in the absence of effective investment absorption mechanisms.

The weak growth performance of public investment underscores the need for complementary institutional and fiscal reforms. Improving public financial management, strengthening governance and accountability in capital spending, and reducing inefficiencies in project implementation are essential to ensure that public investment supports, rather than undermines, private sector–led growth. Without such reforms, monetary policy–induced increases in public investment are unlikely to translate into sustainable economic expansion.

More broadly, the findings highlight the importance of closer coordination between monetary and fiscal policy in Nigeria. Since public investment outcomes are largely shaped by fiscal institutions and budgetary processes, aligning monetary conditions with

productive fiscal spending can enhance the overall effectiveness of policy transmission. Strengthening financial intermediation, deepening credit markets, and improving the efficiency of resource allocation within the financial system would further amplify the responsiveness of private investment to monetary signals and reinforce the growth impact of policy actions.

Overall, this study contributes to the literature by demonstrating that in a structurally constrained developing economy, monetary policy affects economic growth indirectly and unevenly through investment channels. The results emphasise that sustainable growth in Nigeria depends not merely on the availability of liquidity or the adjustment of policy instruments, but on the capacity of the economy, particularly the private sector, to transform monetary impulses into productive investment and real output growth.

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