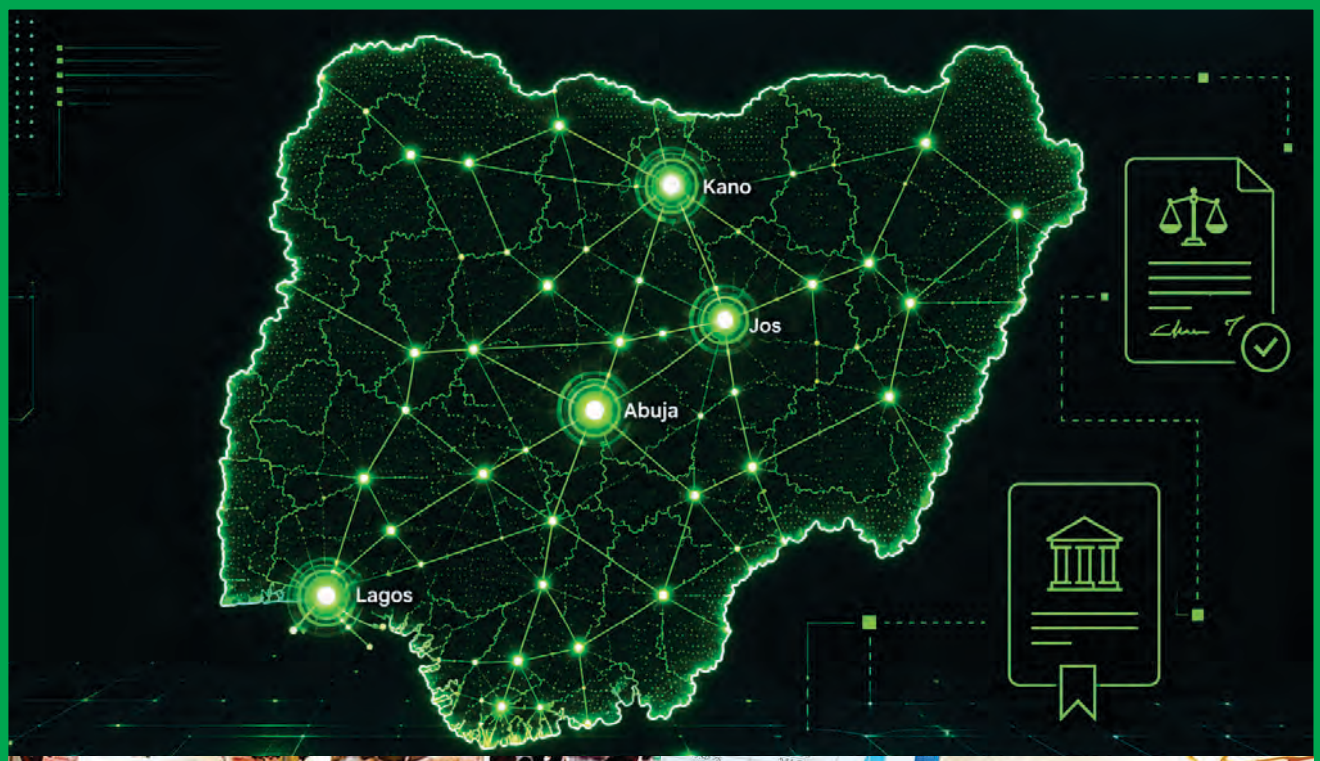
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Oluwasola D. Ajewole PhD

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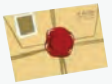
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CONTENTS

Central Bank of Nigeria (CBN) Global Award 2026: Strategic Reforms, Economic Stabilisation and Institutional Excellence under the Leadership of Governor Olayemi Cardoso — 6
By: Polycarp Ishaku M. PhD

Artificial Intelligence, Economic Governance and Financial Stability in Nigeria: Emerging Risks and Opportunities — 22
By: Suleiman Usman Yusuf

Monetary Policy Transmission and Real-Sector Growth in Nigeria: A Critical Review of Channels, Constraints and Enterprise Implications — 36
By: Olusegun T. Odesola PhD
Oluwatoyin A. K. PhD

Inflation, Food Affordability and Consumer Adaptation in Nigeria: Evidence from the Akara-Kuli Kuli Social Media Debate — 47
By: Godwin Okatahi Oniwon PhD

Technology, Green Finance, and Monetary Policy Transmission: A New Framework for Sustainable Economic Transformation — 57
By: Adedapo Adenekan PhD
Bandele A. G. Amoo PhD

Effect of Forensic Accounting Techniques on Financial Statement Fraud in Microfinance Banks in Nigeria — 77
By: Professor Adeoye A. Afolabi
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BULLION

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Based on the above, we hereby recommend implementing a policy that permits up to 20% AI-generated content in any manuscript submitted for publication in the Bullion.

We look forward to receiving your submissions.

CBN BULLION: AUTHORS' PROFILES

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Professor Adeoye Amuda Afolabi, a chartered accountant and Professor of Accounting at Kwara State University, is a teacher, researcher, mentor, and community servant. He teaches undergraduate and postgraduate students, supervises master's and doctoral research, serves as an external examiner for African and European universities, and publishes in peer-reviewed journals.

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Central Bank of Nigeria (CBN) Global Award 2026: Strategic Reforms, Economic Stabilisation and Institutional Excellence under the Leadership of Governor Olayemi Cardoso



Polycarp Ishaku M. PhD
Special Duties Department
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Abstract

This paper examines the recognition of the Central Bank of Nigeria (CBN) as Central Bank of the Year 2026 within the context of the reform agenda initiated under Governor Olayemi Cardoso in September 2023. Using a descriptive analytical approach and evidence from the CBN, IMF, World Bank, and FATF, the study assesses reforms in monetary policy, foreign exchange market liberalisation, institutional governance, and digital financial inclusion. Findings indicate that the reforms contributed to moderating inflationary pressures, clearing a US$7 billion FX backlog, strengthening external reserves, facilitating Nigeria's exit from the FATF grey list, and enhancing banking sector resilience. The paper concludes that the award reflects strengthened institutional credibility and improved macroeconomic management.

Keywords: *Reforms, Central Bank, monetary policy*
JEL Classification Codes: *P11, E58, E52*

1.0 Introduction

Central banks occupy a pivotal position in modern economic governance, as their ability to maintain price stability, safeguard financial system integrity and anchor expectations shapes macroeconomic performance and long-term development. Kydland and Prescott (1977) demonstrated that discretionary monetary policy generates an inflationary bias where policymakers are not constrained by credible rules, justifying independent, rule-based central banking. Subsequent research reinforces the importance of institutional credibility, transparency and policy consistency, particularly in emerging markets where institutional weaknesses and political pressures heighten the challenges facing monetary authorities (Blinder, 1999; Calvo & Reinhart, 2002; Mishkin, 2004; Dincer & Eichengreen, 2014). Against this backdrop, the recognition of the Central Bank of Nigeria (CBN) as Central Bank of the Year 2026 warrants examination beyond the award itself. Conferred by a distinguished international panel of monetary policy and financial sector experts, it provides an independent, evidence-based acknowledgement of the Bank's reforms and institutional transformation, and raises an analytical question: to what extent does the award reflect measurable improvements in monetary policy credibility, financial sector governance and institutional effectiveness? For Nigeria, with its longstanding challenges of commodity dependence, macroeconomic volatility and institutional credibility, the award also signals to investors, correspondent banks, multilateral institutions, rating agencies and trading partners renewed confidence in the CBN's capacity to deliver price stability, financial system soundness and effective monetary governance.

When Governor Olayemi Cardoso assumed office in September 2023, the CBN faced significant macroeconomic and institutional challenges arising from prolonged policy misalignment and weakened credibility. Headline inflation subsequently exceeded 30 per cent; the foreign exchange market remained fragmented across multiple windows despite previous attempts at unification, with an approximately 60 per cent divergence between official and parallel market rates; Ways and Means financing stood at ₦22.7 trillion; outstanding foreign exchange obligations had accumulated to approximately US$7 billion; and Nigeria's placement on the

Financial Action Task Force (FATF) grey list in February 2023 had further weakened investor confidence and the country's international financial standing (FATF, 2023; IMF, 2024; World Bank, 2024).

These challenges were compounded by distortions in the foreign exchange market. Ozili (2024) observes that the multiple exchange rate regime created arbitrage opportunities, weakened price discovery, distorted resource allocation and discouraged legitimate capital inflows. At the same time, extensive quasi-fiscal operations and departures from the Bank's core monetary and regulatory mandates had blurred the distinction between monetary management and fiscal support, raising concerns about institutional autonomy, policy consistency and the CBN's capacity to effectively deliver price stability and financial system soundness. The reform programme introduced under Governor Cardoso marked a decisive shift towards monetary discipline, institutional credibility and market-based policy management. It rested on four interrelated pillars: restoring price stability through disciplined monetary tightening; consolidating and deepening the unified foreign exchange market; strengthening institutional governance, transparency and regulatory compliance; and expanding digital financial infrastructure to deepen inclusion and payment system efficiency. Rather than isolated interventions, these measures formed a coordinated strategy addressing immediate macroeconomic imbalances and underlying institutional weaknesses, while refocusing the Bank on its core mandate.

The reform outcomes have been measurable. Headline inflation declined from a peak of 34.80 per cent in December 2024 to 15.10 per cent in January 2026, while external reserves increased to US$52.52 billion as at 17 July 2026, equivalent to about 11 months of import cover. The premium between official and BDC foreign exchange rates narrowed to below 2 per cent, signaling improved market efficiency and price discovery. Institutional gains were also significant: Nigeria was removed from the FATF grey list in October 2025, reflecting progress in strengthening anti-money laundering and counter-terrorism financing frameworks, while the banking sector mobilised ₦4.65 trillion through the recapitalisation programme, strengthening financial system resilience and its capacity to support economic growth.

These outcomes received validation from international institutions and financial markets. The IMF's 2024 Article IV Consultation described the unification of official foreign exchange windows in June 2023 as a foundational reform and noted that adjustment towards market-determined exchange rates, though disruptive in the short term, was necessary to support sustainable and inclusive growth (IMF, 2024). Similarly, Nigeria's successful Eurobond issuances of US$2.2 billion in December 2024 and US$2.35 billion in November 2025 attracted strong investor demand, with the latter issuance recording subscriptions exceeding US$13 billion (Debt Management Office, 2024, 2025). The strong oversubscription provided a market-based signal of renewed investor confidence in Nigeria's economic management and reform trajectory.

Accordingly, this paper treats the award as an external signal of the credibility of the reforms undertaken by the Bank, and provides a systematic, evidence-based assessment of the CBN's reform programme under Governor Cardoso. Drawing on data from the CBN, IMF, World Bank, FATF, peer-reviewed literature and other credible policy sources, it evaluates the rationale and effectiveness of the reforms in restoring macroeconomic stability, strengthening institutional credibility, improving foreign exchange market functioning, enhancing regulatory and supervisory effectiveness, and aligning the Bank with international central banking standards, before assessing achievements, remaining challenges and broader implications for economic governance in Nigeria. The remainder of the paper is structured as follows. Section Two reviews the literature and Section Three explains the methodology. Section Four provides the pre-reform context, Section Five examines the pillars of the reform agenda, and Section Six presents the assessment framework and findings. Section Seven discusses policy implications and lessons, and Section Eight concludes with recommendations.

2.0 Literature Review

Monetary policy reforms can have significant and lasting effects on macroeconomic performance, particularly through their influence on policy credibility and inflation expectations. The theoretical foundation for independent, rule-based central banking rests on the time inconsistency problem advanced by Kydland and Prescott (1977). Barro and Gordon (1983) further

show that once credibility is weakened, restoring it requires sustained and observable policy actions rather than pronouncements alone. Empirical evidence broadly supports this: Arnone et al. (2006) identify an inverse relationship between central bank independence and inflation, while Blinder (1999) and Mishkin (2007) emphasise consistency, transparency and predictability. The credibility challenge is particularly important in emerging market economies, where monetary policy is often complicated by fiscal pressures, external vulnerabilities and institutional constraints. Fraga et al. (2003) argue that effective disinflation requires monetary tightening to be complemented by institutional reforms that limit fiscal dominance and reinforce policy credibility. More recently, Nagy Mohácsi et al. (2024) find that emerging market central banks combining decisive policy action with clear communication achieved stronger inflation outcomes during the post-pandemic inflation episode, particularly where institutional credibility was already well established. These findings highlight credibility as an important policy asset in periods of macroeconomic adjustment.

Exchange rate arrangements also have important implications for macroeconomic stability and market confidence. Agénor (1992) shows that multiple exchange rate regimes can create parallel-market premiums, distort resource allocation and encourage rent-seeking behaviour. In the Nigerian context, Ozili (2024) argues that the pre-reform multiple-window foreign exchange system generated arbitrage opportunities, weakened transparency and discouraged investment. Accordingly, the exchange rate unification measures introduced in June 2023 can be viewed as a structural reform aimed at strengthening price discovery, improving market efficiency and rebuilding confidence in the foreign exchange market. The literature further emphasises that technically sound reforms require strong institutions and sustained leadership to produce durable outcomes. Acemoglu and Robinson (2012) associate institutional transformation with the capacity to overcome entrenched interests, while Andrews et al. (2017) emphasise leadership capable of sustaining reforms despite resistance. Within the financial sector, Barth et al. (2004) identify effective, independent banking supervision as an important determinant of financial stability, and Nance (2018) and Kida & Paetzold (2021) associate successful exit from the FATF grey list with stronger legal frameworks, supervisory capacity and credible enforcement. Bovaird & Löffler (2003) highlight the role of external assessments in promoting institutional accountability and reputational credibility.

Taken together, the literature provides four propositions for assessing the CBN's reform programme: credibility is built through consistent policy action rather than declarations alone (Kydland & Prescott, 1977; Mishkin, 2007); successful disinflation in emerging markets requires complementary monetary and institutional reforms that address fiscal dominance (Fraga et al., 2003; Nagy Mohácsi et al. (2024); exchange rate and governance reforms are foundations for restoring market confidence and financial sector credibility (Ozili, 2024; Nance, 2018); and durable transformation requires sustained leadership able to maintain reform momentum (Acemoglu & Robinson, 2012; Andrews et al., 2017). These propositions provide the conceptual basis for the analysis that follows.
While the existing literature provides important insights into individual dimensions of monetary policy, foreign exchange reform and institutional governance and financial sector credibility, these issues are often examined separately. This paper contributes to literature by considering the reforms as an integrated programme and assessing their combined macroeconomic, financial and institutional outcomes, as well as their relationship to the CBN's recognition as Central Bank f the Year 2026.

3.0 Methodology And Analytical Approach

The study adopts a descriptive analytical approach using secondary data from the CBN, NBS, IMF, World Bank, FATF, DMO, SEC and other credible sources. The analysis broadly covers 2021 to 2026, allowing comparison of pre reform conditions with developments following the commencement of the reform programme in September 2023.

Key indicators examined include inflation, monetary policy rates, exchange rates, external reserves, capital inflows, banking sector recapitalisation, financial system integrity and selected institutional reforms. The analysis relies on stylised facts, trend analysis and before and after comparisons. It is descriptive and does not establish causality, as observed outcomes may also reflect fiscal, supply side, structural and external factors. Limitations include data

revisions, differences in frequency and the short post reform period.

4.0 Stylised Facts: Pre-reform Economic Conditions In Nigeria

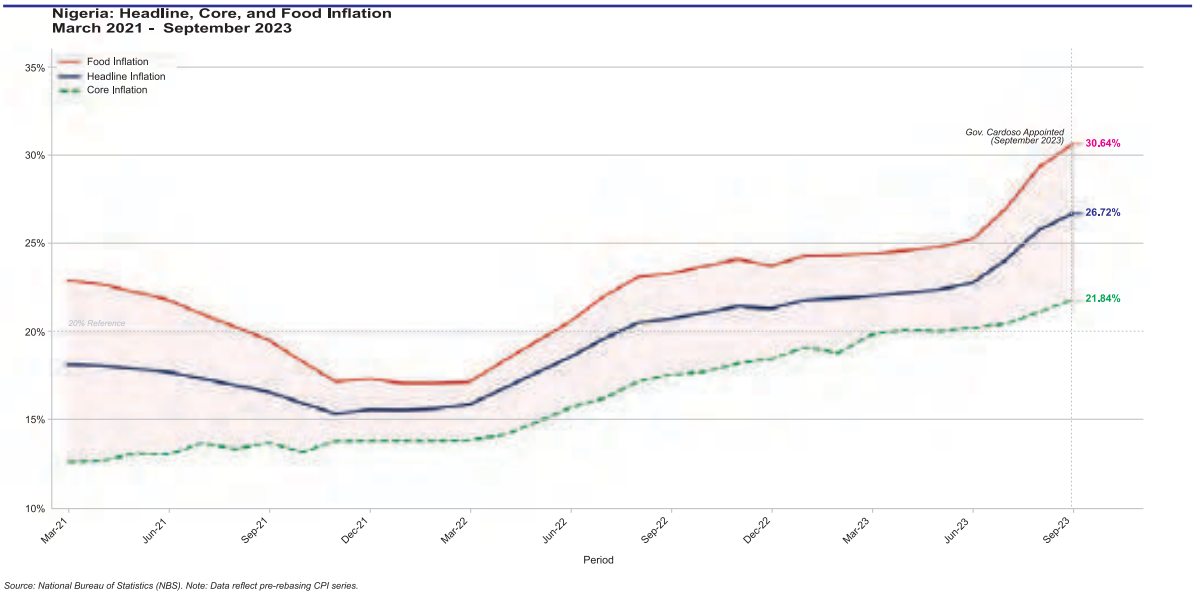
This section provides a data-driven diagnostic assessment of Nigeria's macroeconomic and institutional conditions immediately preceding the reform programme. Drawing on evidence from the National Bureau of Statistics (NBS), the CBN, the IMF and the World Bank, it establishes the empirical baseline against which the scope, effectiveness and outcomes of the reform agenda can be evaluated, and sets out the economic and institutional challenges confronting the country at the onset of the reform period.

4.1 A Chronic and Accelerating Inflation Crisis

Nigeria entered the reform period amid persistent and rising inflationary pressures. Headline inflation increased from 15.63 per cent in December 2021 to 21.34 per cent in December 2022 and continued to accelerate in 2023, reaching 26.72 per cent by September 2023. Food inflation rose even faster, reaching 30.64 per cent in September 2023 and imposing significant welfare pressures, particularly on low-income households whose expenditure is disproportionately concentrated on food.

The inflationary environment reflected domestic and external factors, including food supply constraints, rising energy and transportation costs, exchange rate depreciation, structural bottlenecks and the monetary financing of fiscal deficits through the Ways and Means facility. The removal of the petrol subsidy in May 2023 and the exchange rate adjustment from June 2023 amplified price pressures through higher energy, transportation and import costs, creating a difficult inflation environment at the onset of the new administration and underscoring the limits of monetary policy alone in restoring price stability.

Figure 1: Trend of Headline, Core and Food Inflation (Mar 2021-Sept. 2023)

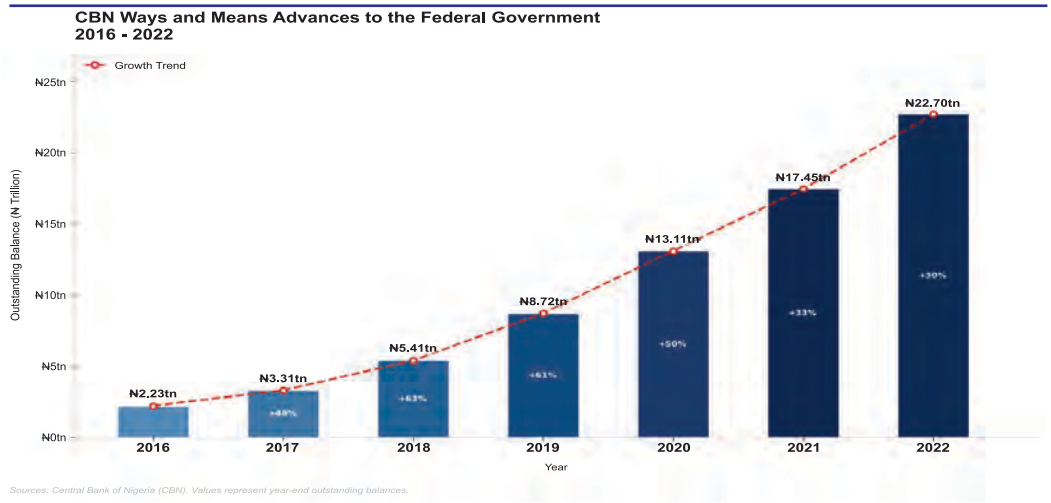


Source: NBS 2024 and CBN Statistical Bulletin 2024

4.2 Quasi-Fiscal Interventions and Governance Weaknesses

The accumulation of ₦22.7 trillion in Ways and Means advances to the Federal Government had significantly expanded the monetary base, creating a structural liquidity overhang that had to be addressed as a precondition for effective inflation management. In 2022 alone, the fiscal deficit stood at ₦7.03 trillion, while total public debt reached ₦46.25 trillion, or 23.2 per cent of GDP (CBN, 2022). The Bank simultaneously administered an extensive portfolio of development finance interventions, disbursing directly to agriculture, manufacturing and energy. This dual role weakened the integrity of the Bank's balance sheet, eroded its operational independence and created the policy inconsistency identified in the literature as detrimental to disinflation credibility (Fraga et al., 2003). The cumulative effect was an institution operating under competing mandates, with management attention diverted from core monetary policy and supervisory responsibilities at a time when those functions were most critical (World Bank, 2024).

Figure 2: CBN Ways and Means Advances to the Federal Government



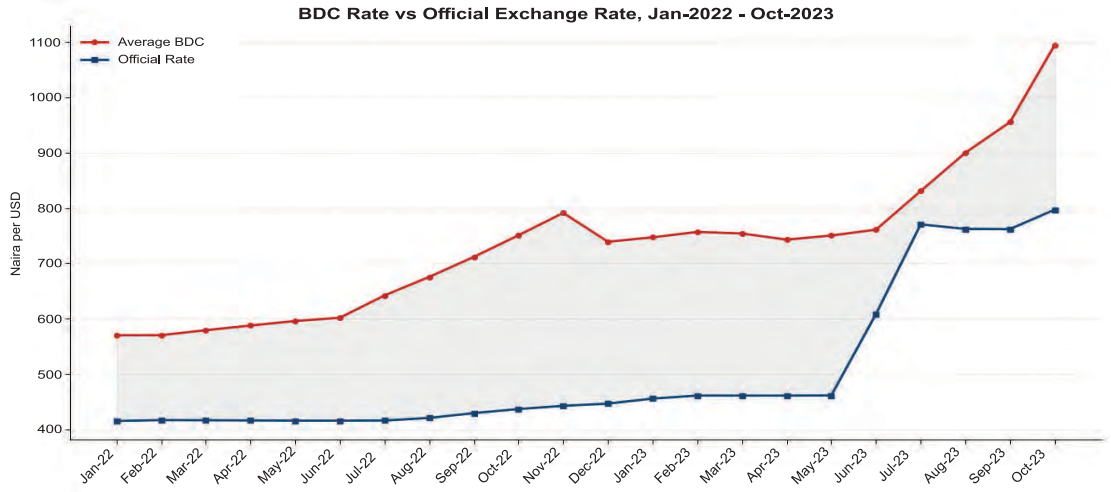
Source: CBN Statistical Bulletin 2023

4.3 A Fragmented and Distorted Foreign Exchange Market

Nigeria's pre-reform foreign exchange system was highly fragmented, with multiple official and BDC market windows, persistent FX shortages and a widening gap between official and BDC market rates. By mid-2023, the BDC market rate had reached ₦750–₦800/US$, compared with an official rate of ₦450.71/US$ at end-2022, implying a premium of about 60 per cent (CBN, 2022; IMF, 2024). These distortions weakened price discovery, encouraged arbitrage and contributed to an estimated US$7 billion backlog of unmet foreign exchange obligations, adversely affecting businesses and investor confidence.

In June 2023, the CBN commenced the transition towards a more market-determined exchange rate under a willing-buyer, willing-seller framework. While this marked an important step towards exchange rate unification, significant challenges remained when the administration assumed office in September 2023, including the outstanding FX backlog, limited market liquidity, exchange rate volatility and weakend market confidence.

Figure 3: Nigeria: BDC vs Official Exchange Rate (Jan 2022 - Oct 2023)

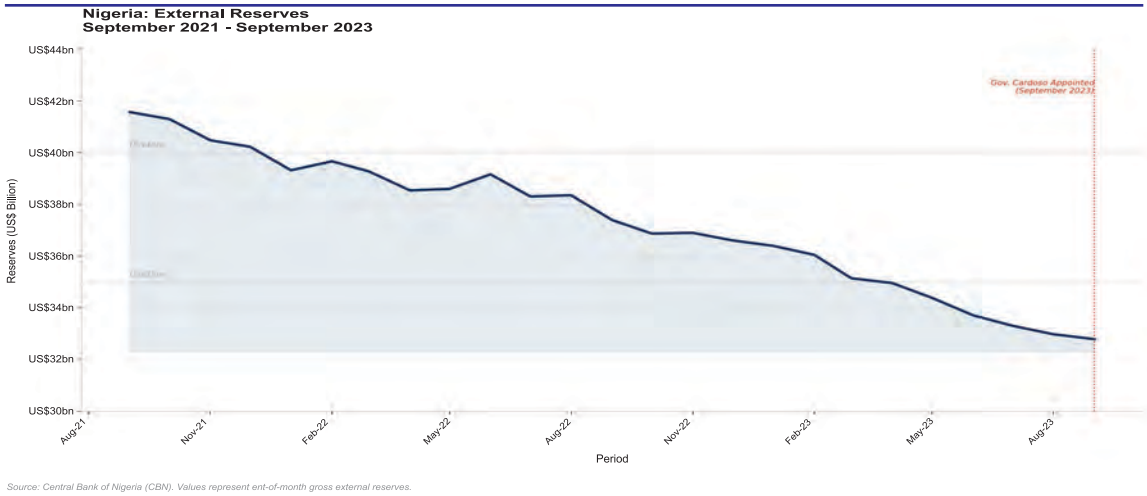


Source: CBN Statistical Bulletin 2024

4.4 A Declining External Reserve Position

External reserves also deteriorated, declining from US$40.23 billion in 2021 to US$36.55 billion in 2022 and about US$32.9 billion by end-2023 (CBN, 2022). More critically, Net Foreign Exchange Reserves (NFER) stood at US$3.99 billion at end-2023, against gross reserves of US$33.22 billion. Since NFER excludes near-term liabilities such as FX swaps and forward obligations, it better measures readily available buffers. The weak reserve position constrained the CBN's capacity to manage FX pressures, heightened volatility and raised concerns among investors and international counterparties about Nigeria's external liquidity.

Figure 4: Trend of External Reserve Sept. 2021-Sept 2023



Source: CBN Statistical Bulletin 2024

4.5 The FATF Grey Listing and Institutional Reputational Damage

In February 2023, Nigeria was placed on the FATF grey list following the identification of strategic deficiencies in its anti-money laundering and counter-terrorism financing framework, reflecting weaknesses in its legal and regulatory architecture, supervisory enforcement and oversight of high-risk sectors including real estate, precious metals and non-bank financial intermediaries. As Nance (2018) and Kida & Paetzold (2021) document, grey listing imposes measurable economic costs: correspondent banking relationships are often terminated or subjected to enhanced due diligence, raising transaction costs; foreign direct investment weakens; and sovereign risk premiums rise. For Nigeria, the designation compounded existing macroeconomic and institutional pressures, reinforcing the need to strengthen regulatory compliance, supervisory effectiveness and international financial credibility. Together, these stylised facts establish the empirical baseline against which the outcomes of the Cardoso reform programme can be objectively assessed.

5.0 The CBN Reform Programme and Outcomes

The appointment of Governor Olayemi Cardoso in September 2023 marked a turning point in Nigeria's monetary and financial sector governance. Assuming office amid considerable macroeconomic and institutional strain, he embarked on a comprehensive and carefully sequenced reform programme aimed at restoring policy credibility, strengthening institutional effectiveness and rebuilding confidence in the CBN. The agenda was structured around four interrelated pillars: monetary policy normalisation, foreign exchange market restructuring, institutional and governance reforms, and the advancement of digital finance alongside broader financial stability initiatives. Rather than isolated measures, the Bank adopted a coordinated approach addressing both immediate imbalances and deeper structural weaknesses. The IMF (2024) characterised the country's policy direction as "an ambitious reform path to restore macroeconomic stability and support inclusive growth". This section examines each reform domain in turn, highlighting the principal measures, their rationale and measurable outcomes.

5.1 Monetary Policy Reforms

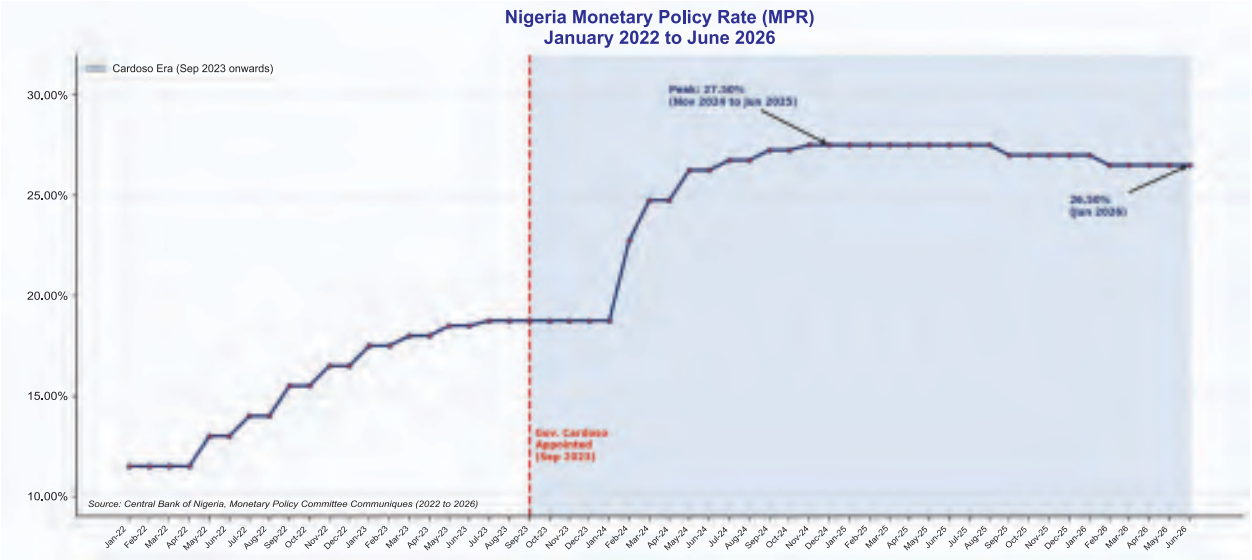
5.1.1 Return to Orthodox Monetary Policy

Against the backdrop of elevated inflation, excess liquidity and weakened policy credibility, a central element of Governor Cardoso's reform agenda was the CBN's return to orthodox monetary policy and renewed focus on its core mandate of price stability. This involved greater use of conventional monetary policy instruments, tighter liquidity management, improved policy communication and a gradual withdrawal from quasi-fiscal activities and extensive development finance interventions. The objective was to restore the effectiveness of monetary policy, better anchor inflation expectations and rebuild confidence in the Bank's commitment to price stability.

Between February and late 2024, the Monetary Policy Committee (MPC) raised the Monetary Policy Rate (MPR) from 18.75 per cent to 27.50 per cent, a cumulative increase of 875 basis points and one of the most aggressive monetary tightening cycles in Nigeria's modern central banking history. The tightening was reinforced by a high Cash Reserve Ratio (CRR), which was maintained at 50.0 per cent through July 2025,

alongside other liquidity management measures aimed at absorbing excess banking system liquidity and strengthening monetary policy transmission. However, as inflationary pressures moderated and macroeconomic conditions improved, the Bank reduced the CRR for Deposit Money Banks (DMBs) to 45.0 per cent in September 2025 as part of a cautious shift toward monetary easing, while maintaining a policy stance consistent with sustaining price stability.

Figure 5: Monetary Policy Rate, Jan 2022- June 2026



Source: CBN Statistics database 2026

The tightening cycle was accompanied by greater emphasis on communication and forward guidance. As Governor Cardoso stated at the 2024 Annual Bankers' Dinner, "We are committed to price stability and will maintain tight monetary conditions until we see sustainable disinflation" (Cardoso, 2024). These measures strengthened policy signalling and confidence in the CBN's commitment to price stability.

Inflation remained elevated through 2024, reflecting the interaction of monetary conditions with exchange rate pass-through, fuel subsidy removal, food supply constraints and other structural pressures. Headline inflation peaked at 34.80 per cent in December 2024. In January 2025, the National Bureau of Statistics rebased the Consumer Price Index, creating a methodological break in the inflation series and affecting the direct comparability of pre- and post-rebasing rates. By January 2026, headline inflation stood at 15.10 per cent. The moderation observed after the rebasing should therefore be interpreted separately from the statistical break and reflects a combination of sustained monetary tightening, improved foreign exchange market conditions, fiscal measures, supply-side developments and base effects.

Figure 6: Nigeria's Headline Inflation Rate, Jan 2022- June 2026



Source: NBS 2026 and CBN Statistics database 2026

As illustrated in Figure 6, the broader inflation trajectory indicates moderating price pressures through 2025 and 2026, notwithstanding the methodological break. Sustained monetary restraint contributed to this adjustment alongside improved foreign exchange market conditions, evolving fiscal conditions, supply-side developments and other domestic and external factors. The reform also involved a progressive withdrawal from direct development finance intervention and a renewed emphasis on separating monetary policy from quasi-fiscal activities. This helped refocus the Bank on its core mandates improved balance sheet integrity, and brought Nigerian practice into alignment with the international norms for central bank governance articulated by the Bank for International Settlements (World Bank, 2024).

5.1.2 Strengthening the Framework for Inflation -Focused Monetary Policy

The return to orthodox monetary policy has been accompanied by efforts to strengthen the institutional foundations for a more inflation-focused framework, including greater reliance on the policy rate and liquidity management, improved forecasting and surveillance, and clearer communication of the Bank's commitment to price stability. These measures strengthen transmission, better anchor expectations and improve policy predictability, providing building blocks for a possible evolution towards formal inflation targeting as institutional, analytical and market conditions mature.

5.1.3 Introduction of Nigerian Overnight Financing Rate (NOFR)

The CBN also introduced the Nigerian Overnight Financing Rate (NOFR) as a transparent benchmark for short-term interest rates, calculated from actual secured overnight lending transactions between financial institutions. Its introduction aligns Nigeria with international best practice, where benchmark rates are increasingly based on observable market transactions rather than administered rates. By improving transparency in money market pricing and strengthening the transmission of policy decisions to broader financial markets, the NOFR supports the transition towards an inflation-focused framework and the development of deeper, more efficient financial markets.

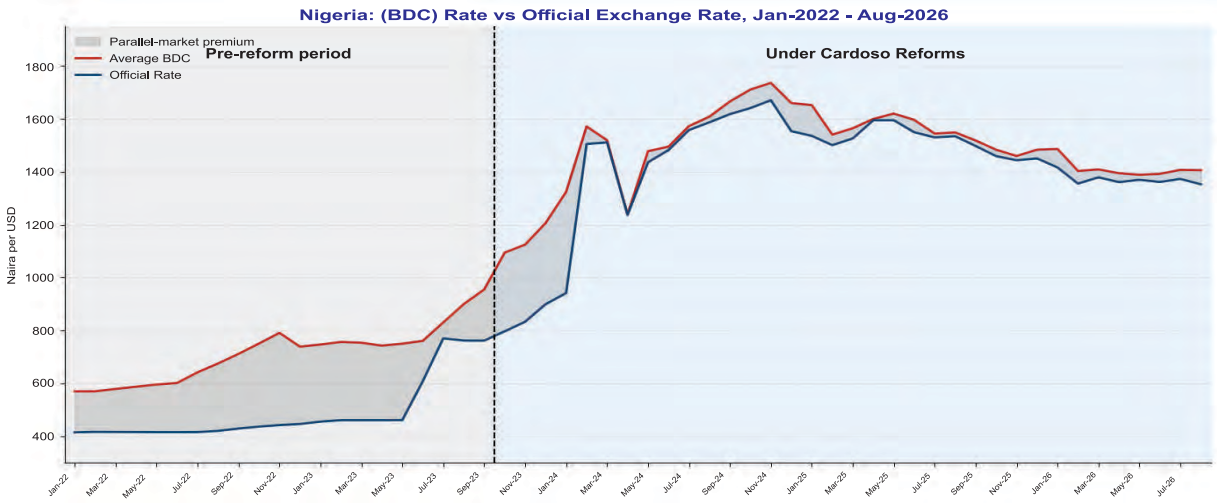
5.2 Foreign Exchange Market Reforms

Alongside monetary policy tightening, the reform of Nigeria's foreign exchange market constituted perhaps the most consequential and immediately visible dimension of the CBN's programme. Building on the transition towards a market-determined exchange rate initiated in June 2023, the new administration focused on consolidating the reform, addressing legacy obligations, improving market transparency and liquidity, and restoring confidence in the FX market.

5.2.1 Consolidation and Deepening of Foreign Exchange Market Reforms

Following the initial exchange rate unification in June 2023, the Cardoso led administration deepened the trasnsition towards a more transparent and market-driven foreign exchange system. Key measures included improving price discovery and market liquidity, removing restrictions on access to FX for previously excluded import categories, strengthening market conduct and progressively narrowing the gap between official and BDC market rates. These measures helped reduce market distortions and strengthen confidence in the functioning of the FX market.

Figure 7: BDC vs Official Exchange Rate, Jan. 2022 - Aug. 2026



Source: CBN Statistics database 2026

5.2.2 Clearance of Legacy Foreign Exchange Obligations

Among the most consequential early actions was the systematic clearance of US$7 billion in verified foreign exchange obligations. International airlines including British Airways, Emirates and Air France had been unable to repatriate revenues trapped in naira, leading several carriers to suspend or reduce Nigerian operations. The clearance, completed in March 2024, restored confidence among international businesses and supported the normalisation of airline operations, with benefits for connectivity, trade and investor sentiment (CBN, 2024).

5.2.3 Electronic Foreign Exchange Matching System

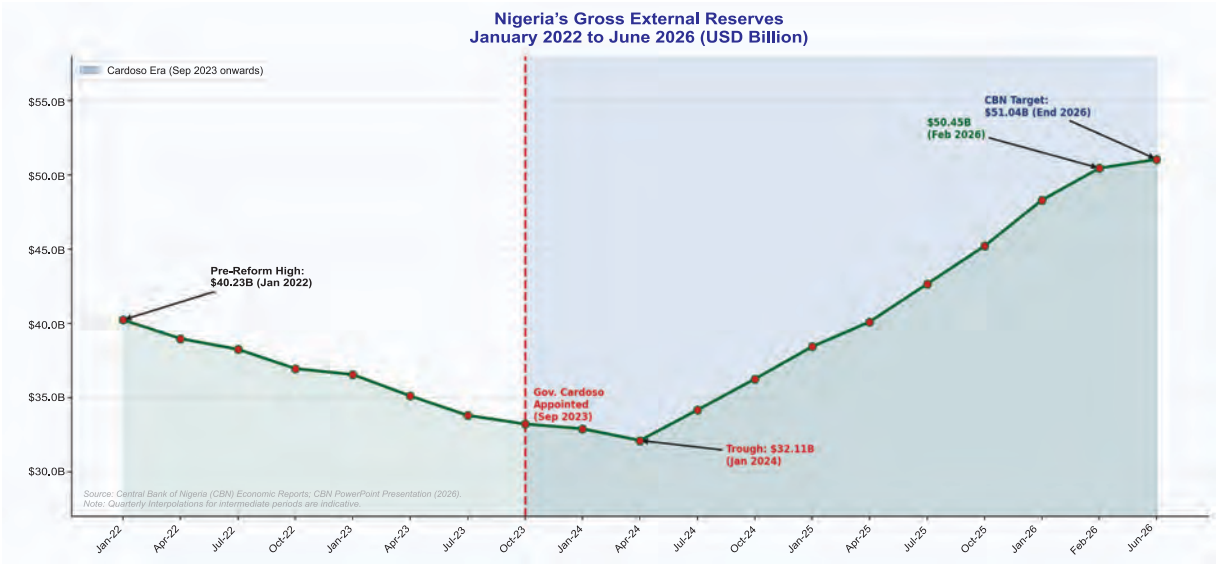
The CBN introduced the Electronic Foreign Exchange Matching System, integrated with Bloomberg's BMatch technology, replacing the fragmented and opaque FX allocation system with a transparent, rules-based electronic marketplace. The platform enabled real-time price discovery, reduced information asymmetry and limited discretionary allocation, addressing inefficiencies in market architecture and laying the foundation for a deeper, more liquid and more efficient foreign exchange market.

5.2.4 Rebuilding External Buffers and Investor Confidence

Improved market conditions, stronger capital inflows and higher external receipts supported a significant rebuilding of external reserves, which rose from about US$32.9 billion at end-2023 to over US$53.8 billion by end-August 2026, strengthening Nigeria's capacity to absorb external shocks. Reserves surpassed US$54 billion in early September 2026, reaching approximately US$54.08 billion, the highest level since 2008.

The improvement was accompanied by stronger portfolio inflows and renewed international investor interest, refelecting greater confidence in Nigeria's macroeconomic reform direction. While these gains also benefited from broader domestic and external conditions, the increased transparency and improved functioning of the FX market contributed to the recovery in market confidence.

Figure 8: Nigeria's Reserve, Jan 2022- June 2026



Source: CBN Statistics database 2026

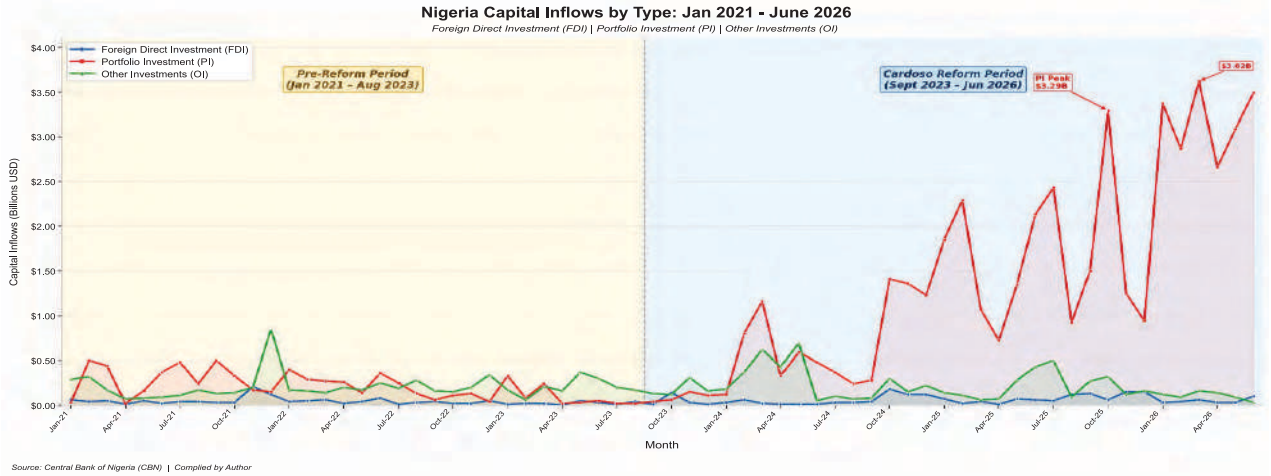
Capital inflows also strengthened during the period, driven largely by portfolio investment. Nigeria returned to the international Eurobond market in December 2024 with a US$2.2 billion issuance (Debt Management Office, 2024).

This was followed in November 2025 by a further US$2.35 billion Eurobond issuance, which attracted subscriptions exceeding US$13 billion (Debt Management Office, 2025). The strong demand for the issuances provided a market-based indication of renewed investor appetite for Nigerian sovereign assets and improving confidence in the country's macroeconomic reform trajectory. Foreign portfolio investment flows also recovered during the period, amid improved foreign exchange market transparency and reduced uncertainty.

Figure 9 illustrates two distinct capital flow regimes separated by a decisive policy turning point. In the pre-reform era (January 2021 to

August 2023), inflows were modest and broadly flat across all three investment types: portfolio investment rarely exceeded US$0.50 billion in any month and trended downward through 2022 and early 2023 amid currency distortions and policy uncertainty, foreign direct investment remained thin, and other investments offered only occasional bright spots.

Figure 9: Nigeria's Capital Inflows by Type Jan. 2021 – Jun. 2026



Source: CBN Statisitc Database 2026

The reform era from September 2023 marks a clear inflection point. Exchange rate unification, monetary tightening and restored macroeconomic credibility coincided with a surge in portfolio investment, from under US$0.10 billion at the onset of reforms to a peak of US$3.62 billion in March 2026, more than seven times the highest pre-reform figure. While foreign direct investment is yet to respond with equal force, sustained portfolio inflows suggest improved appetite for Nigerian assets amid greater FX market transparency and policy credibility.

5.3 Institutional and Governance Reforms

The CBN's transformation extended beyond monetary and foreign exchange policy. A comprehensive institutional overhaul addressed governance weaknesses, compliance deficiencies and structural inefficiencies accumulated over an extended period, restoring the Bank's credibility as a regulatory authority and its international standing.

5.3.1 Bank Recapitalisation Programme

In March 2024, the Central Bank of Nigeria launched a major recapitalisation programme, raising the minimum capital requirement to ₦500 billion for international commercial banks, ₦200 billion for national banks and ₦50 billion for regional banks. The objective was to strengthen the resilience of the banking system, rebuild capital buffers eroded by inflation and exchange-rate depreciation, and enhance banks' capacity to support a larger and more diversified economy.

By the conclusion of the programme in 2026, the industry had mobilised about ₦4.65 trillion in fresh capital through rights issues, public offers, private placements and other approved options (Securities and Exchange Commission, Nigeria, 2026). Beyond meeting regulatory thresholds, the exercise strengthened confidence in the banking system and improved its capacity to absorb shocks and support larger credit exposures. The real test lies in how effectively the new capital is deployed. Stronger capital should be matched by sound asset quality, prudent risk management, good governance and sustainable earnings, and banks may face pressure on returns unless capital is channelled into viable, risk-adjusted lending and investment.

The recapitalisation may also encourage further consolidation as institutions reassess their business models and market positions. While this could produce stronger and more efficient banks, it will require close supervisory attention to integration, governance, operational and concentration risks.

Ultimately, success should be measured not by the amount of capital raised, but by whether it delivers stronger financial intermediation, greater credit to productive sectors, improved resilience and a banking system better able to support sustainable growth.

5.3.2 Exit from the FATF Grey List

Nigeria's removal from the FATF grey list on 24 October 2025 represented a significant national inter-agency achievement. The decision followed Nigeria's completion of the FATF Action Plan and progress in addressing identified deficiencies in its anti-money laundering, counter-terrorist

financing and counter-proliferation financing framework. The FATF acknowledged improvements in risk-based supervision, beneficial ownership transparency, financial intelligence, money laundering investigations and prosecutions, terrorist financing enforcement and related institutional measures. Within this broader national effort, the CBN contributed through strengthened AML/CFT/CPF supervision of regulated financial institutions (Financial Action Task Force, 2025). The exit strengthened Nigeria's international financial standing and reduced the heightened scrutiny associated with grey-listing, with positive implications for correspondent banking relationships, cross-border transactions and investors perceptions.

The European Union formally delisted Nigeria from its own list of high-risk third countries in January 2026, further lending credence to the country's international financial standing (European Commission, 2026).

5.3.3 Internal Restructuring and Compliance Architecture

The Bank undertook a comprehensive internal restructuring programme, establishing a dedicated Compliance Department with an enhanced mandate, introducing strengthened accountability mechanisms, and redeploying staff on the basis of competency assessments aligned with the Bank's reformed strategic priorities. The restructuring strengthened internal controls and deepened corporate governance within the Bank, enhancing accountability, improving oversight, and supporting more effective institutional decision-making. A new institutional ethos was articulated and consistently communicated: the CBN would operate as a credible, transparent and independent institution guided by its statutory mandate rather than as an instrument of short-term fiscal policy. This cultural shift, though difficult to quantify, was reflected in improved assessments by international evaluators and renewed trust among market participants, correspondent banks and development finance institutions.

5.4 Digital Finance and Financial System Stability

Complementing its macroeconomic and governance reforms, the CBN advanced Nigeria's digital financial infrastructure, building on the country's position as Africa's largest fintech ecosystem. These initiatives strengthened the payments system, expanded financial inclusion and reinforced resilience against emerging operational and cyber risks. A major milestone was the launch of the Nigeria Payments System Vision 2028 (PSV 2028) in June 2026, providing a strategic framework for a more secure, inclusive, innovative and globally connected payment ecosystem.

5.4.1 Payments System Enhancement

The CBN continued to invest in and expand Nigeria's instant payment infrastructure, deepening the capabilities of the Nigeria Inter-Bank Settlement System and driving interoperability between deposit money banks and mobile money operators. PSV 2028 further provides a framework for strengthening regulatory oversight, expanding financial inclusion and improving integration with regional and global payment systems.

5.4.2 Financial Inclusion and the Women Financial Inclusion Code

The Bank continued to promote financial inclusion through initiatives expanding access to formal financial services among underserved groups, including the Women Financial Inclusion Code, a voluntary framework encouraging licensed institutions to track and improve women's access to financial services. The annual CBN Fair, a nationwide consumer education and financial literacy outreach programme, was expanded in scope and reach, promoting financial literacy, consumer awareness and digital financial services adoption.

5.4.3 Cybersecurity and Supervisory Resilience

As financial services became increasingly digital, the CBN strengthened cybersecurity requirements and financial crime frameworks. In 2026 it deployed the Cybersecurity Self-Assessment Tool (CSAT) to support risk-based supervision, enhanced fraud controls for instant payments and set baseline standards for automated AML/CFT/CPF solutions, reinforcing the safety, resilience and integrity of the financial system.

6.0 Interpreting the 2026 Central Bank of the Year Award

The recognition of the CBN as Central Bank of the Year 2026 provides important external validation of the reform programme examined in this paper. In announcing the award, Central Banking highlighted the Bank's return to orthodox monetary policy, its decisive monetary tightening measures, foreign exchange market reforms, the clearance of outstanding foreign exchange obligations, and broader efforts to restore policy credibility, transparency and confidence in Nigeria's financial system (Central Banking,

2026). These achievements formed the basis of the international recognition and reflect the progress made in repositioning the Bank towards its core mandate of price and financial system stability.

While the award was conferred based on the achievements highlighted by Central Banking, a broader assessment of the reform programme provides additional insight into its significance and implications for monetary and economic governance in Nigeria. Accordingly, this paper evaluates the reforms across four analytical dimensions: macroeconomic stabilisation; foreign exchange and market reform; financial system resilience; and institutional credibility and governance. These dimensions are not the formal assessment criteria of the Awards Committee; rather, they provide a structured framework through which the wider impact, coherence and sustainability of the reforms can be examined.

Analytical Dimension	Key Reform Evidence	Significance
Macroeconomic Stabilisation	Monetary tightening, improved monetary discipline and moderation in inflationary pressures	Reinforced commitment to price stability and strengthened policy credibility
Foreign Exchange and Market Reform	FX reforms, clearance of verified FX obligations, improved price discovery and stronger external buffers	Reduced market distortions, improved transparency and supported investor confidence
Financial System Resilience	Bank recapitalisation, payments modernisation, stronger financial integrity and FATF exit	Strengthened the capacity, integrity and resilience of the financial system
Institutional Credibility and Governance	Improved governance and transparency, organisational reforms and renewed focus on the CBN's core mandate	Reinforced accountability, institutional confidence and policy effectiveness

The award should, however, be viewed as recognition of progress rather than completion. Inflation, exchange rate pressures, structural constraints and the need for deeper financial intermediation remain important challenges. Its enduring significance will therefore depend on the extent to which the policy discipline, market reforms and governance improvements recognised by the award are sustained and institutionalised.

The CBN's recognition builds on its earlier distinction at the African Banker Awards 2025, where Governor Cardoso received the Central Bank Governor of the Year award. The back-to-back recognition by leading institutional evaluators on the continent underscores the depth and consistency of the reform effort.

7.0 Impact, Lessons, and Global Implications

7.1 Macroeconomic Impact

While these outcomes reflect the interaction of monetary, fiscal, structural and external factors, the CBN reforms contributed to an improvement in Nigeria's macroeconomic and financial conditions. Key outcomes during the reform period include:

I. Moderation in Inflationary Pressures: Following the significant acceleration in inflation through 2024, price pressures subsequently moderated. While monetary tightening contributed to this adjustment, the outcome also reflected fiscal measures, exchange-rate developments and evolving supply conditions.

II. Improved Foreign Exchange Market Functioning: Greater market transparency, improved price discovery and the clearance of verified legacy FX obligations contributed to reduced distortions and improved confidence in

the foreign exchange market.

III. Strengthened External Buffers: Gross external reserves increased significantly during the reform period, strengthening Nigeria's capacity to absorb external shocks and supporting greater confidence in the external sector.

IV. Improved Financial System Resilience: The bank recapitalisation programme strengthened the capital base of the banking system, while complementary supervisory and governance reforms enhanced the foundations for financial stability.

V. Stronger Policy Coordination: Greater engagement between monetary and fiscal authorities supported a more coordinated approach to macroeconomic stabilisation, although sustained alignment remains necessary to consolidate the gains achieved. The Bank has itself emphasised that effective fiscal-monetary coordination remains critical to sustaining macroeconomic stability.

VI. Improved Growth and External Assessment: The IMF's 2026 Article IV Consultation assessed that reforms over the preceding three years had improved macroeconomic outcomes and strengthened resilience. Real GDP growth was estimated at 4.0 per cent in 2025 and projected at 4.1 per cent in 2026, although the IMF also emphasised continuing inflation, poverty and food-security challenges.

7.2 Lessons for Monetary Policy Institutions

The CBN's experience offers several instructive lessons for monetary authorities in emerging market economies grappling with similar structural challenges:

- Credibility must be demonstrated through consistent policy action rather than declared through communication alone. The 875-basis-point tightening cycle, sustained across multiple Monetary Policy Committee meetings under considerable political pressure, was essential in establishing that the CBN's commitment to inflation reduction was genuine and durable.

- Structurally necessary reforms must be implemented with courage and conviction even when they entail significant short-term adjustment costs. The unification of exchange rates, long delayed due to political economy constraints, caused real hardship in the transition period but was indispensable for restoring market functionality and investor confidence.

- Monetary and institutional governance reforms are complementary and mutually reinforcing. The FATF grey list exit was as important to Nigeria's financial credibility as the monetary tightening cycle; international investors evaluate institutional integrity holistically and will not commit capital to markets where governance deficiencies create unacceptable risks.

- Policy communication is itself an instrument of monetary policy. The CBN's improved transparency through clearer Monetary Policy Committee communiqués, regular speeches by the Governor, and expanded public outreach helped anchor expectations in a manner that amplified the effectiveness of rate actions.

- Institutional reforms must be embedded in law and regulatory frameworks to ensure durability beyond the tenure of any individual leadership. Sustainable institutional improvement requires systemic change rather than personal relationships.

7.3 Implications for African Monetary Integration

Nigeria's reform experience offers broader lessons for economies confronting inflation, foreign exchange shortages, weak policy transmission and declining institutional credibility. A key lesson is that durable stabilisation requires a coherent package of monetary, exchange rate, financial-sector and governance reforms rather than isolated interventions. The experience also demonstrates the importance of sequencing reforms, strengthening credibility and maintaining policy consistency while managing the social cost of adjustment, a point echoed in the IMF's 2026 assessment.

For African economies, stronger domestic financial systems can also support deeper regional financial integration. More resilient banks, transparent foreign exchange markets, robust AML/CFT/CPF frameworks and secure interoperable payment systems can facilitate cross-border trade, investment and financial flows. Nigeria's exit from FATF increased monitoring in October 2025 further illustrates the value of sustained institutional remediation and international regulatory compliance in strengthening financial credibility. The wider significance of the CBN's reform experience lies not in providing a single model for other countries,

but in demonstrating how credible institutions, disciplined macroeconomic management and stronger financial infrastructure can reinforce economic resilience and create a firmer foundation for regional and global financial integration.

8.0 Recommendations

I. Institutionalise Fiscal and Monetary Policy Coordination

Establish a structured framework for regular information sharing and policy coordination between the CBN and relevant fiscal authorities, with clearly defined institutional boundaries. This would improve the alignment of liquidity management, public debt operations and fiscal financing with monetary policy objectives, while preserving the operational independence of the Bank.

ii. Deepen Foreign Exchange Market Reforms

Consolidate recent FX reforms by deepening interbank liquidity, strengthening implementation of the FX Code and expanding transparent hedging instruments, including forwards and other derivatives. Continued improvements in market infrastructure and surveillance would strengthen price discovery, reduce volatility and further reinforce confidence in the FX market.

iii. Strengthen Transparency and Policy Communication

Institutionalise regular public reporting on key reform outcomes, including monetary policy transmission, foreign exchange market conditions, reserve adequacy, financial system soundness and payments performance. Clear and consistent communication would strengthen policy predictability, anchor expectations and reinforce the credibility gained from recent reforms.

iv. Strengthen Monetary Policy Transmission and the Transition to Inflation Targeting

Build the institutional and operational foundations for a credible inflation-targeting regime by strengthening forecasting and nowcasting capabilities, inflation expectations surveys and the transmission of policy rates through financial markets. The implementation of the Nigerian Overnight Financing Rate should also be leveraged to improve money-market pricing and strengthen the effectiveness of monetary policy signals.

v. Consolidate Post-Recapitalisation Financial System Resilience

Shift supervisory attention beyond compliance with minimum capital requirements towards the quality and productive deployment of new capital. Enhanced stress testing and risk-based supervision should focus on asset quality, credit concentration, liquidity, corporate governance, cybersecurity and operational resilience, while encouraging banks to translate stronger capital positions into sustainable credit to productive sectors of the economy.

vi. Deepen Financial Inclusion, Payments Resilience and Consumer Trust

Accelerate implementation of the Payments System Vision 2028 through measurable milestones for financial inclusion, interoperability, transaction security, fraud reduction and consumer protection. Particular attention should be given to underserved populations, MSMEs and geographically excluded communities, while strengthening dispute resolution and public confidence in digital financial services.

vii. Institutionalise the Reform Gains and Strengthen Accountability

Embed the major reforms undertaken since 2023 within enduring institutional frameworks, policies and governance processes to ensure their continuity beyond the current leadership. The CBN should consider publishing a periodic Reform and Institutional Performance Report tracking progress across monetary policy, FX market development, financial stability, governance, payments and financial inclusion against clearly defined indicators.

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Artificial Intelligence, Economic Governance and Financial Stability in Nigeria: Emerging Risks and Opportunities



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Abstract

This paper examines how artificial intelligence (AI) is reshaping economic governance and financial stability in Nigeria between 2024 and 2026. Using qualitative analysis of Central Bank of Nigeria (CBN) regulations, national AI policy documents, reports of international standard-setters, and recent empirical studies, it finds that AI strengthens fraud detection, economic nowcasting and oversight of public expenditure. However, it also introduces risks, including cybersecurity threats, market concentration, algorithmic bias, herding behaviour, and explainability risks, which gaps in regulatory capacity, data, and infrastructure magnify. The paper concludes that Nigeria needs a risk-proportionate AI supervisory framework, mandatory algorithmic audits and phased institutional capacity building.

JEL Classification: E52, E58, G21, G28, O33
Keywords: Artificial Intelligence, Financial Stability, Economic Governance, Central Banking, Nigeria

1.0 Introduction

The period 2024–2026 has been a defining phase for the Nigerian economy, operating in a complex, volatile environment shaped by deep structural reforms and shifting macroeconomic conditions. The after-effects of major policy changes have characterised the period, notably the unification of the foreign exchange (FX) windows and the removal of petrol subsidies in 2023. Although these reforms were intended to strengthen long-term fiscal sustainability, they were followed in the short term by elevated inflation and exchange rate volatility, compelling the Central Bank of Nigeria (CBN) to maintain a tight monetary policy stance for an extended period. By September 2026, with headline inflation having moderated to 15.39 per cent in August, the Monetary Policy Committee reduced the Monetary Policy Rate from 26.5 per cent to 23.0 per cent (CBN, 2026b). Monetary policy, therefore, enters a new phase in which the accurate and timely reading of economic conditions has become very important.

Alongside these conventional macroeconomic difficulties, a quieter but equally profound change has been gathering pace: the rapid and extensive deployment of artificial intelligence (AI) within both the financial services sector and the wider machinery of public administration. For the CBN, AI is a double-edged sword. It promises efficiencies in monetary policy analysis, real-time economic oversight, fraud detection, and financial inclusion, but it also introduces a portfolio of new, often opaque, "black-box" risks that could threaten the very stability that regulators are charged with protecting (FSB, 2024; Danielsson and Uthemann, 2025).

The push for AI adoption in Nigeria is driven less by global technological fashion than by domestic necessity. Nigeria's FinTech ecosystem is one of the most vibrant in Africa and a key driver of digital transformation. The value of transactions processed on the Nigeria Inter-Bank Settlement System (NIBSS) Instant Payment platform rose to about ₦1.07 quadrillion in 2024, up from ₦600.36 trillion in 2023, while mobile money operators alone processed about ₦79.5 trillion (Vanguard, 2025).1 At these volumes, traditional analytical approaches and manual oversight are no longer adequate. AI systems, which can process millions of data points in real time, have therefore become key tools for fraud detection, credit scoring, and

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customer interaction. As at February 2025, ten of Nigeria's twenty-six commercial banks had deployed conversational AI (Lagos Business School and Microsoft, 2025). However, much of this deployment has taken place in a regulatory environment that is struggling to keep pace with the speed of innovation.

The international literature on AI and financial stability has grown rapidly since the Financial Stability Board's (FSB) first assessment of the subject (FSB, 2017). Recent contributions by the FSB (2024; 2025), the International Monetary Fund (IMF, 2024), the Bank for International Settlements (BIS, 2024) and academic researchers (Gensler and Bailey, 2020; Danielsson and Uthemann, 2025) have identified third-party concentration, market correlation, cyber risk and model risk as the main channels through which AI may threaten financial stability. However, this submission is largely drawn from, and designed for, advanced economies with deep capital markets, mature data infrastructure and well-resourced supervisors.

Evidence for Nigeria remains limited and fragmented. Existing studies have tended to examine individual dimensions of the problem, such as the risks AI poses to financial stability (Ozili et al., 2025), the use of AI in central bank liquidity management (Efuntade and Efuntade, 2024), algorithmic bias in FinTech credit scoring (Obi, 2025), AI-enabled governance and anti-corruption tools (Adisa et al., 2025), and AI-related cyber resilience in financial institutions (Odumusor et al., 2026). Few studies bring the economic governance and financial stability dimensions together in a single framework that is directly usable by policymakers. This gap matters because fiscal governance, payment integrity, credit allocation, and monetary transmission in Nigeria are closely interlinked, so weakness in one area spreads quickly to others. The 2024–2026 period therefore represents a "policy inflection point" at which Nigerian regulators must put in place a governance framework that balances the drive for technological advancement against the need for systemic safety.

The overall objective of this paper is to provide a policy-oriented analysis of the relationship between AI, economic governance and financial stability in Nigeria, and to propose practical pathways for the CBN and other institutional stakeholders. The paper adopts a qualitative approach based on a structured review of documents published mainly between 2017 and 2026. The rest of the paper is organised as follows. Section 2 sets out the conceptual and theoretical framework and examines AI in economic governance. Section 3 analyses AI's benefits and risks for financial stability. Section 4 assesses Nigeria's policy and regulatory challenges, and Section 5 presents recommendations, an implementation roadmap, and the conclusion.

2.0 Artificial Intelligence and Economic Governance in Nigeria

2.1 Understanding Artificial Intelligence in the Context of Public Policy

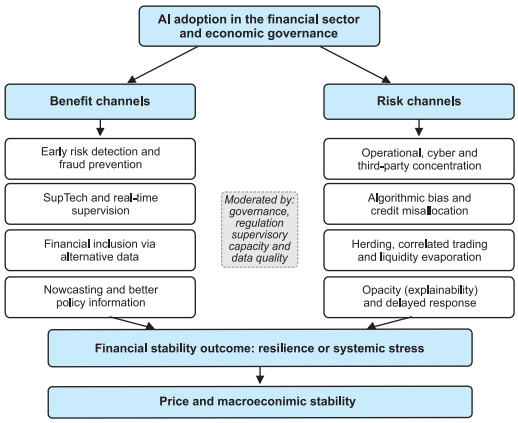
2.1.1 Conceptual Clarification

There is no single, universally accepted definition of AI. For policy purposes, this paper adopts the approach of the OECD (2024), which describes an AI system as a machine-based system that, for explicit or implicit objectives, infers from the inputs it receives how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Three families of AI are most relevant here: machine learning, which learns patterns from historical data and is used for credit scoring, fraud detection, and forecasting; natural language processing, which powers chatbots and text analysis; and generative AI, which produces new text, code, and images and has lowered the cost of both productive and malicious applications (Nassr, 2023; FSB, 2024).

Economic governance refers to the institutions, rules and processes through which public authorities make and implement fiscal, monetary and regulatory policies and are held accountable. Financial stability is a condition in which the financial system continues to perform its role of intermediation, payments and risk management, even under shocks, without severe disruption to the real economy.

The link between the three concepts is that AI changes both the quality of information available to policymakers and the behaviour of the market participants they oversee. Figure 1 summarises the channels through which AI adoption is transmitted to financial and macroeconomic stability. These channels provide the conceptual framework for the rest of the paper.

Figure 1: Transmission of Artificial Intelligence to Financial and Macroeconomic Stability



Source: Author's conceptualisation, drawing on FSB (2024) and BIS (2024).

2.1.2 Theoretical Underpinnings

Four strands of economic theory help to explain the effects of AI on governance and stability. The first is the theory of information asymmetry. Akerlof (1970) showed that when one party to a transaction knows more than the other, markets may function poorly or fail. Stiglitz and Weiss (1981) extended this insight to credit markets, showing that lenders who cannot distinguish good from bad borrowers may ration credit rather than raise interest rates. AI-based credit scoring is, in effect, an attempt to reduce this asymmetry by drawing on new sources of data. Empirical studies confirm that mobile phone usage data can predict loan repayment among borrowers with no credit history (Björkegren and Grissen, 2020). However, the same theory predicts a new asymmetry between regulated firms, which understand their models, and supervisors, who may not.

The second strand concerns herding and procyclicality. Scharfstein and Stein (1990) showed that managers may rationally imitate the decisions of others to protect their reputations, even when their private information suggests otherwise. When many institutions rely on similar AI models trained on similar data, a technological version of herding may arise, with correlated responses to the same signals (Gensler and Bailey, 2020). Minsky's (1992) financial instability hypothesis adds that stability itself can breed instability, as periods of calm encourage risk-taking. AI systems trained on data from calm periods may underestimate risk precisely when conditions are about to change, which Danielsson and Uthemann (2025) describe as “wrong-way risk”.

The third strand is the regulatory dialectic. Kane (1981) argued that regulation and financial innovation interact in a continuous cycle: regulation induces innovation designed to avoid it, and regulators respond with new rules after a lag. AI accelerates this cycle and widens the lag. Stigler's (1971) theory of regulatory capture warns that regulators who depend on the industry for expertise and information may come to reflect its interests. Both theories are relevant to Nigeria, where supervisory capacity in AI is still developing. The fourth strand is the literature on regulatory and supervisory technology (RegTech and SupTech), which argues that the digitisation of finance requires a corresponding digitisation of regulation (Arner et al., 2017). It implies that the CBN must itself become an intelligent user of AI, not only its regulator. Taken together, these theories suggest that AI can improve efficiency and inclusion but may, without adequate governance, increase opacity, correlation and procyclicality in the financial system.

2.2 Opportunities for Economic Governance

Nigeria's economic governance landscape is shifting towards “digital-first” models, with the piloting of AI and distributed ledger technologies to improve transparency, accountability and service delivery. The main driver of this shift is the need for better resource allocation and the systematic elimination of leakages in public spending, a priority that has taken on new importance in the context of current fiscal consolidation efforts. Adisa et al. (2025) propose a digitally integrated governance model that combines AI and blockchain to create a “trustless” environment for public financial management. In this model, blockchain-based traceability allows funds to be tracked in detail from the federal treasury to the final point of expenditure, while AI-powered audit systems monitor these flows for signs of diversion or inefficiency. In auditing and institutional oversight, Nigerian public institutions have historically relied on retrospective, sample-based auditing. Such traditional methods are often too slow to detect sophisticated financial crimes and too narrow to reveal broader systemic inefficiencies. By contrast, AI systems can support “continuous auditing”, in which transaction flows are monitored in real time and anomalies, such as ghost workers on a payroll or irregular disbursements on a public works project, are flagged immediately for investigation (Adisa et al., 2025; Bochner, 2025). This is particularly valuable for public debt management, where

high-frequency oversight helps ensure that domestic and external borrowings are used transparently.

AI is also being used to improve the delivery and targeting of public services, which are central to Nigeria's social contract. AI systems can process applications and identify eligible citizens for purposes ranging from the assessment of tax liabilities to the management of large social safety net programmes, with a speed and precision that manual systems cannot match. The National Artificial Intelligence Strategy identifies sector-wide AI adoption, including in public services, as one of its core pillars (FMCIDE, 2025). By automating routine work, AI can also free public servants for more complex policy tasks. However, such initiatives succeed only where data are of good quality and digital infrastructure is robust, two areas in which Nigeria still faces major bottlenecks (Section 2.3).

AI also has implications for fiscal–monetary coordination. It can help the CBN and the Federal Ministry of Finance to pursue their objectives more effectively through more accurate, high-frequency forecasts of government revenue and expenditure. AI analysis of non-traditional data sources, such as satellite imagery of agricultural areas, transport flow data, and digital transaction volumes, can provide a more granular and timely view of the economy than traditional lagging indicators such as gross domestic product (GDP) or inflation figures (BIS, 2024). Such "nowcasting" provides near real-time measures of economic activity. Improved transparency of this kind is a key element in managing the inflationary pressures and exchange rate volatility that have posed persistent challenges for Nigerian policymakers in recent years. In essence, AI can serve as a "digital lens" that allows policymakers to see the details of the Nigerian economy more clearly and respond more effectively.

2.3 Current State of AI Readiness in Nigeria

Nigeria has taken important steps towards an enabling environment for AI. In April 2025, the Federal Government launched the National Artificial Intelligence Strategy, which rests on five pillars: infrastructure development, building a world-class AI ecosystem, sector-wide AI adoption, responsible AI use, and a robust governance framework. The Strategy sets out twelve goals and thirty-four initiatives (FMCIDE, 2025). It builds on the National Digital Economy Policy and Strategy 2020–2030 (FMCDE, 2020) and on the Nigeria Data Protection Act 2023, which established the Nigeria Data Protection Commission (NDPC) and introduced rules on the lawful processing of personal data, including safeguards relating to automated decision-making (NDPC, 2023).

Within the financial sector, the CBN has moved from general guidance towards specific expectations on AI. In March 2026, it issued Baseline Standards for Automated Anti-Money Laundering Solutions, which require banks and other financial institutions to deploy automated systems with capabilities such as anomaly detection, behavioural pattern recognition and automated risk scoring. The standards require independent validation of machine learning models at least once a year, a documented governance framework, human oversight, and explainable alerts. Deposit money banks have eighteen months and other financial institutions twenty-four months to comply (CBN, 2026a; TechCabal, 2026). This is the clearest signal to date that the CBN regards AI as a supervisory concern as well as a commercial tool. Significant readiness gaps nevertheless remain. Broadband penetration stood at about 48 per cent in April 2025, and Nigeria ranked 132nd out of 220 countries for internet speed (Lagos Business School and Microsoft, 2025). A shortage of skilled AI professionals persists across both the public and private sectors, although national programmes such as the Three Million Technical Talent (3MTT) initiative have begun to address it. Unreliable power supply, the high cost of computing capacity and the fragmented state of public sector data further limit the scale at which AI can be deployed. Readiness is therefore uneven.

2.4 Lessons from International Experience

International experience offers useful, though not directly transferable, lessons. The European Union adopted a comprehensive, risk-based approach through its Artificial Intelligence Act (Regulation (EU) 2024/1689). The Act classifies AI systems used to evaluate the creditworthiness of individuals as "high-risk", which subjects them to requirements on data quality, documentation, human oversight and transparency (European Union, 2024). Singapore took a principles-based route. The Monetary Authority of Singapore issued the Fairness, Ethics, Accountability and Transparency (FEAT) principles in 2018 and then worked with industry, through the Veritas

initiative, on practical methods for assessing compliance (MAS, 2018).

The United Kingdom has relied mainly on existing, technology-neutral rules, supported by regular market monitoring. A 2024 survey by the Bank of England and the Financial Conduct Authority found that 75 per cent of UK financial firms were already using AI, and that a third of all use cases were implemented by third parties. This highlights the growing importance of concentration and outsourcing risk (Bank of England and FCA, 2024). India offers an example closer to Nigeria's circumstances. In August 2025, the Reserve Bank of India published a Framework for Responsible and Ethical Enablement of Artificial Intelligence (FREE-AI), which combines guiding principles with specific recommendations on governance, infrastructure, capacity and consumer protection (RBI, 2025). Globally, the FSB has moved from identifying vulnerabilities (FSB, 2024) and monitoring adoption (FSB, 2025) to setting out sound practices covering board oversight, data governance, explainability, human oversight, cyber risk and third-party risk (FSB, 2026).

Three lessons emerge for Nigeria. First, a risk-based and proportionate approach, which concentrates the most demanding requirements on high-impact uses such as credit decisions and on systemically important institutions, is more practical than blanket regulation. Second, principles are most effective when they are accompanied by practical assessment tools and close engagement with industry, as the Singapore experience shows. Third, regulators must invest in their own data and monitoring capabilities; without these, even well-designed rules cannot be enforced.

3.0 Artificial Intelligence, Financial Innovation and Emerging Stability Risks

3.1 Artificial Intelligence Applications in the Financial Sector

AI is now embedded across the value chain of Nigerian financial services. In payments and banking, machine learning models monitor transactions for fraud and money laundering, a use that has become a regulatory expectation under the CBN's 2026 baseline standards (CBN, 2026a). In lending, digital lenders and FinTechs use AI-based credit scoring to assess applicants who lack formal credit histories, drawing on “alternative data” such as mobile phone usage and transaction records (Obi, 2025). In customer service, conversational AI handles account enquiries and complaints at scale (OECD, 2021; Lagos Business School and Microsoft, 2025). In the capital market, algorithmic tools support trading, portfolio management and surveillance; the IMF (2024) expects AI to increase the speed and volume of trading. Central banks are also users of AI. The BIS (2024) documents applications in economic nowcasting, the analysis of payment data, supervisory risk assessment, and the processing of large volumes of text such as bank reports and news. In Nigeria, Efuntade and Efuntade (2024) argue that AI-driven optimisation models could improve the efficiency and accuracy of the CBN's liquidity management, while Ozili et al. (2025) note both the potential benefits and the risks of adopting AI in the CBN's own financial stability work.

3.2 Potential Benefits for Financial Stability

When well governed, AI can strengthen financial stability in at least four ways. First, it improves the early detection of risk. Machine learning models can identify unusual patterns in payments, lending and trading data more quickly than traditional methods, providing earlier warning of fraud, operational failures or emerging stress. Second, it strengthens supervision. SupTech tools can help supervisors process regulatory returns, monitor institutions continuously and focus scarce staff on the highest risks (Arner et al., 2017; BIS, 2024). Third, it can deepen financial inclusion, which supports stability by diversifying the funding base of banks and bringing informal activity into the regulated system. By assessing creditworthiness with alternative data, AI can extend credit to individuals and small businesses excluded by traditional models (Björkegren and Grissen, 2020; Ozili, 2025). Fourth, it improves operational efficiency, lowering costs and potentially strengthening the resilience of financial institutions' earnings.

These benefits are, however, conditional on good data, sound model design, human oversight and capable regulators. Where these are absent, the same technologies can become sources of instability.

3.3 Emerging Risks and Vulnerabilities

The risks AI poses to the stability of the Nigerian financial system are as significant as its advantages. They are not hypothetical; they are already emerging as operational realities. Table 1 summarises them in four categories.

Table 1: Artificial Intelligence Risk Taxonomy for the Nigerian Financial System

Risk category	Key drivers	Main transmission channel	Potential stability impact
Operational and cyber	Reliance on a few third-party AI and cloud providers; AI-enabled cyber-attacks and fraud	Payment and banking system disruption	Widespread system outages; loss of data integrity; loss of confidence in digital channels
Distributional	Algorithmic bias in credit scoring; misuse of alternative data; no right of appeal	Credit allocation and consumer outcomes	Financial exclusion; predatory lending; migration to unregulated lenders
Systemic (market)	Similar models and data across firms; high-speed automated trading	Correlated behaviour (herding) and liquidity	Sudden liquidity evaporation; flash crashes; FX market volatility
Governance	Lack of explainability ("black box"); supervisory skills gaps; regulatory fragmentation	Supervisory detection and crisis response	Delayed supervisory response; unclear accountability; regulatory capture

Note: Categories are not mutually exclusive; risks in one category can trigger or amplify risks in another.
Source: Author's compilation based on FSB (2024), Danielsson and Uthemann (2025), Obi (2025) and Ozili et al. (2025).

The first and perhaps most urgent risk is the rapid expansion of the cyber-attack surface. As financial institutions deploy AI-powered systems for everything from customer onboarding to risk management, they create new vulnerabilities that sophisticated attackers can exploit. AI itself can be used as a weapon to automate the discovery of software flaws, to run highly targeted and convincing phishing campaigns, or to bypass traditional security measures (FSB, 2024; Odumusor et al., 2026). In addition, growing reliance on a small number of third-party AI models and cloud service providers introduces "concentration risk".

A technical failure at, or a successful cyber-attack on, one provider could cause a systemic outage across the Nigerian banking network (FSB, 2024; Bank of England and FCA, 2024). The second, and perhaps more pernicious, risk is algorithmic bias and its direct implications for financial inclusion. Machine learning models are fast becoming the "gatekeepers" of credit in Nigeria's dynamic and competitive FinTech market. These models often look beyond traditional credit histories and draw on alternative data, such as airtime purchase patterns, social media activity, and even phone battery usage, to assess creditworthiness.2 This approach promises to bring millions of unbanked Nigerians into the formal financial system, but it also risks replicating, or even worsening, existing structural inequalities.

Research on credit markets in the United States shows that machine learning models can increase disparities in outcomes between groups even when they improve overall accuracy (Fuster et al., 2022). In Nigeria, Obi (2025) finds that opaque credit-scoring algorithms can discriminate based on geography, gender or socio-economic markers, creating a form of "digital redlining". The greater danger is that applicants are denied credit with no clear reason, no remedy and no human review. Such practices can reinforce exclusion, erode public confidence in digital finance and push households towards unregulated lenders. AI also poses systemic vulnerabilities. One pathway is "algorithmic herding". If many financial firms trade, manage liquidity or assess risk using similar AI models trained on similar data, their automated

responses to news or price movements may become highly correlated (Gensler and Bailey, 2020; FSB, 2024). Such coordinated behaviour can lead to so-called "flash crashes", in which liquidity disappears suddenly as automated systems all try to move in the same direction at the same time. Danielsson and Uthemann (2025) show that AI can make the transition from stability to crisis more abrupt, so that crises which once unfolded over days may now occur within minutes. Such feedback loops could be particularly damaging in Nigerian markets, which have thin trading volumes and recurrent FX liquidity shortages, allowing a minor correction to escalate into a system-wide disturbance.

In addition, the "explainability" problem, which is the inherent difficulty of understanding how a complex AI model reaches a particular decision, is a major barrier to regulatory oversight and crisis response (Burrell, 2016). If an AI system fails, or produces a series of poor lending decisions in a major Nigerian bank, it may be very difficult for the CBN to diagnose the root cause quickly enough to prevent contagion. Ozili et al. (2025) caution that in a developing economy such as Nigeria, where institutional safeguards are still evolving, the risk that AI could create unforeseen sources of instability cannot be ignored. Without proactive and detailed oversight, a technology intended to promote stability could itself become a significant source of fragility.

3.4 Implications for Monetary and Financial Stability

The spread of AI requires the CBN to re-examine both its monetary policy toolkit and its broader regulatory philosophy. AI changes the speed and predictability of the monetary policy transmission mechanism. As banks and FinTechs increasingly use AI to adjust lending rates and credit availability in near real time in response to high-frequency signals, the traditional lags between a policy decision and its effect may become shorter or more erratic (BIS, 2024). This is particularly relevant as the CBN moves into an easing cycle, following the September 2026 reduction in the Monetary Policy Rate (CBN, 2026b).

The CBN would therefore need to supplement its traditional econometric models with AI-assisted nowcasting tools that track such shifts as they happen. Monitoring the "algorithmic pulse" of the credit market will be important for price stability in an AI-driven economy. Liquidity management, a core central banking function, is also directly affected. Central banks around the world are exploring AI as a decision-support tool in managing system liquidity and conducting open market operations. However, this transition carries model risk. Efuntade and Efuntade (2024) point out that data quality, technical expertise, and cybersecurity are significant obstacles to the use of AI in the CBN's liquidity management. If the CBN's own algorithms are not well calibrated to the specific features of the Nigerian market, they may unintentionally distort payment flows or create artificial credit squeezes. There is also a risk that market participants may "game" the central bank's algorithms if these become too predictable. The CBN must therefore ensure that AI serves as a support tool for human decision-makers and does not replace professional judgement in high-stakes policy settings. More broadly, the risks in Section 3.3 increase the likelihood that shocks are amplified and transmitted quickly through the system (Figure 1). Because operational, credit, liquidity and confidence channels reinforce one another, AI-related risk must be assessed at the level of the whole system and not only of individual institutions.

4.0 Policy and Regulatory Challenges in Nigeria

4.1 Existing Regulatory Landscape

Nigeria's existing regulatory framework provides a solid foundation but was not designed specifically for AI. The CBN's Framework for Regulatory Sandbox Operations (CBN, 2021b) allows innovative financial products to be tested under supervision. The Regulatory Framework for Open Banking (CBN, 2021a) and its subsequent operational guidelines govern the sharing of customer data through standardised interfaces, which is a key input for AI-based services. The Risk-Based Cybersecurity Framework and Guidelines for Deposit Money Banks and Payment Service Banks (CBN, 2024) set minimum cybersecurity requirements, while the Nigeria Data Protection Act 2023 governs the processing of personal data (NDPC, 2023).

The 2026 baseline standards for automated anti-money laundering solutions are the first CBN instrument to set explicit expectations for model validation, explainability, and human oversight (CBN, 2026a). Responsibilities for AI governance are, however, spread across several institutions, as shown in Table 2.

Table 2: Institutional Responsibilities for AI Governance in Nigeria's Financial System

Institution	Relevant mandate	Proposed AI governance role
Central Bank of Nigeria (CBN)	Monetary policy; banking, payments and financial stability	Lead AI supervisor for banks, FinTechs and payment institutions; systemic AI risk monitoring; AI in stress tests
Nigeria Data Protection Commission (NDPC)	Data protection (Nigeria Data Protection Act 2023)	Rules on automated decision-making, alternative data and consumer data rights
National Information Technology Development Agency (NITDA)	Digital technology standards and policy	National AI technical standards and certification; public sector AI coordination
Securities and Exchange Commission (SEC)	Capital market regulation	Oversight of algorithmic trading and AI-based investment advice; market surveillance
Nigerian Financial Intelligence Unit (NFIU)	Financial intelligence	AI-enabled detection and analysis of financial crime; information sharing
Federal Ministry of Finance / FMCIDE	Fiscal policy; digital economy policy	AI in public financial management; National AI Strategy implementation; digital infrastructure

Source: Author's compilation.
Note: FMCIDE = Federal Ministry of Communications, Innovation and Digital Economy.

4.2 Regulatory Gaps and Emerging Challenges

Several gaps remain. First, there is no comprehensive, sector-wide framework for the use of AI in financial services. Existing instruments address specific functions such as anti-money laundering, cybersecurity, and data sharing, but they do not set general expectations for model risk management, fairness testing, or explainability across all high-impact uses. Obi (2025) observes that the current framework contains weak enforcement mechanisms and limited transparency obligations with respect to AI-based credit scoring.

Second, legal and ethical frameworks are struggling to keep up with technological reality. The Nigeria Data Protection Act 2023 was an important step forward, but it does not fully address complex AI-specific questions, such as the extent of a customer's right to an explanation of automated decisions, liability for harm caused by AI, and the acceptable use of alternative behavioural data in financial services. Third, the financial sector lacks a clear, sector-specific AI strategy that sits beneath the National AI Strategy. The result is a patchwork of rules, with overlapping mandates and differing priorities across agencies. Such regulatory uncertainty can either stifle innovation or allow risks to go unaddressed. Fourth, the digital divide creates a distinct policy challenge. Many Nigerians lack the devices, connectivity, and digital literacy needed to benefit from AI-powered services. “Digital-first” policies that ignore this divide risk widening inequality and further marginalising those with no digital footprint, who are therefore invisible to data-driven credit models (Ozili, 2025). A related challenge is that many lightly regulated FinTechs perform bank-like lending functions without the prudential and conduct requirements applied to banks.

4.3 Institutional Capacity Requirements

The most significant institutional constraint on the safe deployment of AI is the shortage of technical capacity within Nigeria's regulatory and public institutions. The rapid development of AI has outpaced many agencies' ability to recruit or train staff with the necessary skills in data science,

machine learning and AI ethics (Lagos Business School and Microsoft, 2025). This "literacy gap" is not merely a technical issue but a governance issue. Without in-house expertise, regulators may have little choice but to rely on the self-assessments and assurances of the private firms they are required to oversee. This creates a potentially dangerous information asymmetry that may result in regulatory capture or the oversight of systemic risks (Stigler, 1971). Supervisory practice must therefore change. The CBN will need to build a cadre of "algorithmic supervisors": staff trained to carry out in-depth reviews of the machine learning models used by banks and FinTechs. This means stress-testing models under different economic scenarios to ensure they do not behave in a biased or unstable manner under pressure, and asking firms to demonstrate how their models reach decisions and why (Obi, 2025; FSB, 2026).

Infrastructure is a further constraint. AI requires a constant and reliable power supply, high-speed connectivity, and access to substantial computing capacity. Well-documented deficits in the national power grid and the uneven spread of high-speed internet, particularly in rural areas, limit the potential for AI to support broad-based economic governance (Lagos Business School and Microsoft, 2025). Data infrastructure is also still developing. AI needs clean, representative and interoperable data, yet much of the data held by Nigeria's public sector is fragmented across agencies, incompletely digitised or not representative of the country's diverse population. This "data poverty" makes AI models more likely to produce biased or flawed results, particularly for people at the margins of the economy.

4.4 Strategic Considerations for Policymakers

Four strategic considerations should guide policy. The first is balance. Excessively restrictive regulation could slow innovation and push activity into less regulated channels, while excessively permissive regulation could allow systemic risks to build up unnoticed. A proportionate, risk-based approach offers the best balance, in line with international practice (FSB, 2026; RBI, 2025).

The second is coordination. Because AI cuts across the mandates of the CBN, the NDPC, the National Information Technology Development Agency (NITDA), the Securities and Exchange Commission (SEC), the Nigerian Financial Intelligence Unit (NFIU) and the fiscal authorities, no single agency can govern it effectively on its own. A multi-stakeholder approach that also involves the Federal Ministry of Communications, Innovation and Digital Economy, the private sector and civil society is needed to align AI development with Nigeria's wider objectives of economic stability and inclusive growth.

The third is sequencing: given capacity constraints, priority should go to the highest-risk uses and the most systemically important institutions. The fourth is sovereignty and resilience, since heavy dependence on foreign AI models and cloud infrastructure creates exposure to external disruptions and limits the ability of Nigerian authorities to inspect critical systems. The task before Nigerian policymakers is therefore to regulate AI in a manner that builds trust and supports a sustainable, locally owned AI ecosystem.

5.0 Policy Opportunities, Strategic Recommendations and Conclusion

5.1 Policy Opportunities

The analysis points to four immediate opportunities. The CBN can use AI to improve its nowcasting, liquidity forecasting, and supervisory analysis as monetary policy enters a new phase. The fiscal authorities can deploy AI-assisted continuous auditing to reduce leakages in public spending. Policymakers can channel AI-based credit scoring towards responsible inclusion of small businesses and women. Finally, Nigeria can build on existing foundations, including the National AI Strategy, the regulatory sandbox and the 2026 anti-money laundering standards, rather than starting afresh.

5.2 Strategic Policy Recommendations

A forward-looking, coordinated policy response is required both to manage the risks and to realise the full potential of AI in Nigeria's financial and economic systems. The following recommendations are addressed to the CBN and other relevant regulatory stakeholders.

(i) Establish an AI risk management framework for the financial sector. The CBN should develop a formal AI risk taxonomy, building on Table 1, which identifies and categorises AI-specific risks, including cyber, algorithmic, concentration and systemic risks. It should issue clear guidance on how financial institutions should manage these risks. The framework should be integrated into the CBN's macroprudential supervision and inform

the design of system-wide stress tests (Ozili et al., 2025; FSB, 2026).

(ii) Introduce mandatory algorithmic audits and ethical impact assessments. The CBN should require independent audits of AI models used by systemically important financial institutions and FinTech platforms for critical functions such as credit scoring, fraud detection, and liquidity management. These audits should assess the models for bias, accuracy, and robustness, extending to other high-impact uses the annual validation already required for anti-money laundering models (CBN, 2026a). Ethical impact assessments should also be mandatory for any AI deployment that affects consumer outcomes (Obi, 2025).

(iii) Invest in digital infrastructure and sovereign data. The government should create incentives for the development of sovereign data repositories, meaning interoperable, high-quality datasets that reflect Nigeria's economic and social realities, to reduce reliance on foreign models and improve the quality of local AI. Improving broadband connectivity and the stability of the power supply should be treated as national priorities so that AI can be scaled up (FMCIDE, 2025; Lagos Business School and Microsoft, 2025).

(iv) Strengthen institutional capacity. The CBN should work with the private sector and academic institutions to develop a comprehensive AI literacy programme for regulators and the wider public sector. This should include the creation of dedicated "AI Oversight Units", staffed by data scientists and AI ethics specialists, within the regulatory agencies. Public–private research partnerships can help to build local AI expertise and keep pace with global developments.

(v) Expand regulatory sandboxes for responsible innovation. Existing regulatory sandboxes should be expanded and adapted for AI-powered financial services. Such "AI sandboxes" should give innovators access to anonymised data and a controlled environment in which to test products under realistic conditions, with the CBN using the results to develop proactive, evidence-based regulation (CBN, 2021b).

(vi) Enhance cyber resilience and collective defence. The financial sector should adopt a collective defence approach to AI-enabled cyber threats. The CBN should promote an industry-wide AI threat intelligence platform that allows institutions to share information on AI-enabled attacks in real time. Financial software should also be required to comply with secure AI development standards, and the concentration of critical services in a small number of third-party providers should be monitored (CBN, 2024; FSB, 2024).

(vii) Incorporate AI into macro-level stress testing. The CBN's Financial Policy and Regulation and Financial Stability functions should include AI-failure scenarios in regular stress-testing exercises. These scenarios should simulate the effects on the Nigerian financial system of large-scale algorithmic herding, the sudden loss of explainability of critical systems and the failure of a major third-party AI service provider (Danielsson and Uthemann, 2025).

(viii) Institutionalise inter-agency coordination. A standing inter-agency committee on AI in finance, bringing together the CBN, NDPC, NITDA, SEC, NFIU and the Federal Ministry of Finance, should be established to harmonise rules, share information and avoid regulatory gaps and overlaps, with responsibilities along the lines set out in Table 2.

5.3 Roadmap for Implementation

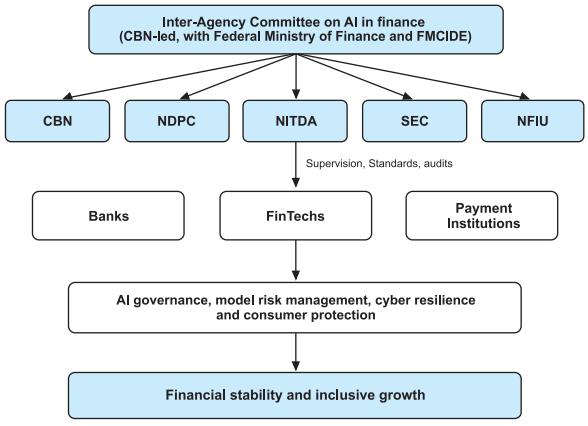
Given capacity and resource constraints, the recommendations should be implemented in phases. Table 3 sets out a proposed roadmap covering the immediate term (up to 12 months), the medium term (one to three years) and the long term (beyond three years). Figure 2 presents the proposed governance architecture that would support implementation.

Table 3: Strategic Policy Roadmap for AI Governance in Nigeria's Financial System

Priority area	Immediate (0–12 months)	Medium term (1–3 years)	Long term (beyond 3 years)	Lead institution(s)
AI governance framework	Issue AI risk taxonomy and guidance for high-impact uses	Mandatory algorithmic audits for systemic institutions	Continuous review and international alignment	CBN, NDPC
Regulatory capacity	AI literacy training for supervisors	Dedicated AI Oversight Units	Advanced SupTech and in-house AI tools	CBN, SEC, NITDA
Cyber resilience	AI threat monitoring; third-party mapping	Sector-wide AI threat intelligence platform	Predictive, collective defence	CBN, NFIU
Data governance	Common data standards	Interoperable public data	Sovereign data infrastructure	NDPC, NITDA, FMCIDE
Stress testing and coordination	Inter-agency AI committee established	AI-failure scenarios in stress tests	Integrated macroprudential AI monitoring	CBN, Federal Ministry of Finance

Note: Timelines are indicative and should be adjusted to available resources.
Source: Author's compilation.

Figure 2: Proposed AI Governance Architecture for Nigeria's Financial System



Source: Author's conceptualisation.

5.4 Conclusion

This paper set out to examine how AI is reshaping economic governance and financial stability in Nigeria and to propose policy pathways for managing the associated risks and opportunities. The analysis leads to four main conclusions. First, AI is not a futuristic technology but a present reality that is already transforming payments, credit, supervision and public financial management in Nigeria. Its opportunities are substantial, including continuous auditing of public funds, nowcasting for monetary policy, stronger fraud detection, and broader financial inclusion.

Second, AI introduces risks that are new in form, though often familiar in substance. Cyber and concentration risks, algorithmic bias, herding and the lack of explainability can each undermine financial stability, and they can reinforce one another. Third, Nigeria's regulatory framework, while improving, remains fragmented. Gaps in supervisory skills, data, and infrastructure magnify the risks. Fourth, a proportionate, risk-based and coordinated response, implemented in phases, offers the most realistic path forward.

These findings confirm the vulnerabilities identified by the FSB (2024) and the IMF (2024) and the Nigerian-specific concerns of Ozili et al. (2025) and Obi (2025). They also support the theoretical expectations in Section 2: AI reduces some information asymmetries in credit markets but creates new ones between regulators and regulated firms, may intensify herding and

procyclicality, and accelerates the cycle of innovation and regulatory response described by Kane (1981).

The paper's contribution is to bring the governance and stability dimensions together in a single framework for a major emerging economy, and to translate this into a sequenced agenda for the CBN and its partners. The paper has limitations. It relies on documentary and secondary evidence because systematic data on AI adoption by Nigerian financial institutions are not yet available. Future research should therefore collect survey data on AI use across banks, FinTechs and public agencies, and should test the links between AI adoption, credit outcomes and market volatility in Nigeria.

Ultimately, the goal is to ensure that AI works for the people of Nigeria. By aligning technological advancement with the core values of fairness, accountability and stability, the CBN can help build a digital economy that is not only efficient but also resilient and inclusive.

With capacity building, transparency requirements and an ecosystem of responsible innovation, Nigeria has a real opportunity to leapfrog long-standing governance challenges and to offer a model of how a developing economy can navigate the AI era safely.

NOTES

1. NIBSS Instant Payment (NIP) is Nigeria's main real-time interbank electronic funds transfer platform. The rapid growth of transaction volumes over 2023–2024 was accompanied by a corresponding rise in reported fraud attempts, which is one of the main reasons for the growing use of AI-based fraud detection in the Nigerian banking sector.
2. The concern is not limited to any single product. Opaque automated credit decisions can affect applicants across digital lending, payments and buy-now-pay-later services, particularly where effective appeal and human review mechanisms are absent.

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Monetary Policy Transmission and Real-Sector Growth in Nigeria: A Critical Review of Channels, Constraints and Enterprise Implications





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Abstract
This article critically reviews monetary policy transmission in Nigeria and its implications for real-sector growth and enterprise performance. It demonstrates that the credit channel dominates, while the interest rate channel remains weak due to structural rigidities, low pass-through, and supply-side constraints. The exchange rate and expectations channels play contingent roles but are undermined by heavy central bank intervention and fiscal dominance. Transmission effectiveness is constrained by shallow financial intermediation (private credit <20% of GDP), financial dualism (large informal finance sector), fiscal dominance (CBN financing of government deficits), underdeveloped capital markets, and institutional weaknesses (weak contract enforcement, information asymmetries). These constraints impose asymmetric burdens on small and medium enterprises (SMEs), which are disproportionately harmed by monetary tightening due to limited access to alternative finance and higher information opacity. The paper proposes a novel conceptual framework integrating transmission channels, structural constraints, and enterprise heterogeneity. It identifies critical research gaps firm-level micro-mechanisms, non-bank intermediaries, comparative African perspectives, targeted policy instruments, digital finance, nonlinearities, expectations, and spatial dimensions and outlines a forward-looking research agenda. Key recommendations include strengthening banking competition, addressing fiscal dominance via statutory limits on ways and means, scaling credit guarantee schemes for SMEs, deepening capital markets, enhancing monetary-fiscal coordination, and developing a coherent digital finance regulatory framework.

Keywords: *Monetary policy transmission, credit channel, real-sector growth, enterprises, financial intermediation.*
JEL Code: *E52, E44, O55, L25, G21*

1.0 Introduction

Transmission of monetary policy is one of the core issues of macroeconomic theory and policy. The interest rate channel, which is part of the focus and basics of both Keynesian and New Keynesian economics, is the movement of interest rates in the market in reaction to policy rate changes affecting investment, aggregate demand, and consumption. Theoretical developments in the 80s have complemented our knowledge of the transmission mechanism. Inclusion of the financial frictions and asymmetric information in the credit channel suggests that the credit channel emphasizes the power of monetary impulses to be amplified by collateral constraints (Khan et al., 2023). The financial accelerator result indicates that when the balance sheet of firms becomes strong, borrowing power can be amplified, resulting in a procyclical cycle (Zarei et al, 2025). Newer literature is concerned with expectations: forward looking agents respond not only to the current policy but also to a set of credible signals of future policy courses. An obvious conclusion that comes from this is that the structure of the financial system, its completeness, and information environment quality affect the effectiveness of policy implementation. In advance economies with broad-based capital markets and high quality institutions, these channels are found to be functioning effectively.

Transmission is more complicated and weak in developing countries like Nigeria. Structural weaknesses such as shallow financial intermediation, the prevalence of dualism between formal and informal financial systems, underdeveloped capital markets, and the regularity of fiscal dominance, break, interrupt, or distort the linkages of policy instruments with real impacts (Khan et al., 2023; Tiedemann et al., 2025). It is not just an academic issue, but one of utmost priority for the success of the Central Bank of Nigeria (CBN) in price stability and sustainable growth goals. For this highly decentralised financial system, it is pivotal to have detailed understanding of the mechanism through which policy can influence this system to draw up realistic and predictable policy frameworks, which would not indirect and disproportionately punish the most disadvantaged enterprises. For instance, when the CBN tightens the Monetary Policy Rate (MPR) to quell inflation in an economy, its impact on aggregate demand may be offset if banks offer to borrow at the higher rate but charge lower than that. On the other hand,

high or increasing Cash Reserve Ratio (CRR) could directly limit credit provision for smaller businesses, leading to a deeper than expected economic slowdown. The monetary policy instrument in Nigeria has come through different stages, starting from direct monetary tools in the 1980s to those instruments that relied on the principle of effective demand during the 1990s up to the current explicit inflation targeting framework, based on MPR, which came into the light in early 2000s. This change is part of a worldwide replacement of nominal policy anchors where effective expectations and discretionary interventions are nominalized. However, the effects of the real sector are staunchly disputed even after having been brought under some measure of fine control within the institutions.

The findings of some recent studies show that it has strong effect on output, employment and business activity (Yahaya, 2026) while others show weak effect or asymmetric effect on lending rates and private investments (Jock et al., 2025; Ogundeji, 2026). This is even more critical for Small and Medium scale businesses (SMEs) which accounts for about 50-80% of GDP with more than 80% of jobs in Nigeria (NBS, 2020). Finance is a lifeline for these companies; as the pace at which it is tightened increases, they are the first and the worst affected, whereas larger companies that have easy access to other sources of financing such as internal financing, bond markets, and borrowing from abroad – are relatively protected. These asymmetrical impacts are not just an economic efficiency issue, but a need for inclusive growth and poverty alleviation. This paper makes four contributions: Firstly, it gives a theoretical discussion of the interest rate, credit, exchange rate, balance sheet and expectation channels, and evaluates their relevance in Nigeria. Second, it shows the empirical evidence from Nigeria, and from other countries, in order to identify trends, inconsistencies, and gaps. Thirdly, it builds a novel conceptual framework about how all these factors, including transmission channels, structural constraints, and enterprise heterogeneity, combine to set up a heuristic resource for researchers and policymakers. Fourth, it depicts a research agenda for the future through emerging trends of the financial sector: digital finance and 'fin-tech'.

2.0 Methodology

The critical interpretive synthesis (CIS) methodology is used in this review, following Dixon-Woods et al. (2006) and Jesson, Matheson and Lacey (2011). CIS is especially suited to the fusion of theoretical and empirical literature because it transcends description to produce new theoretical frameworks. Unlike systematic reviews that aggregate findings in a relatively mechanical way, CIS is iterative, allowing heterogeneous sources theoretical works, qualitative studies, quantitative analyses – to be synthesised into a consistent interpretive argument. This design aligns with the objective of creating a comprehensive conceptual framework that can guide both future empirical research and policy design.

A systematic literature search was conducted between January and March 2025 using Scopus, Web of Science, Google Scholar, African Journals Online (AJOL), and EconLit. Keywords included combinations of: “monetary policy transmission”, “interest rate channel”, “credit channel”, “bank lending channel”, “exchange rate channel”, “balance sheet channel”, “real sector growth”, “output”, “employment”, “investment”, “enterprises”, “SMEs”, “Nigeria”, “Sub-Saharan Africa”, “developing countries”. Manual reference list checking and citation tracking of key recent works (e.g., Yahaya, 2026; Ogundeji, 2026) supplemented the search. The search covered publications from 2022 to 2026 to ensure currency and relevance, capturing the post-COVID policy environment and recent monetary policy shifts.

Studies were included if they: (1) directly addressed monetary policy transmission channels, real sector performance, or enterprise implications in Nigeria or comparable African contexts; (2) were peer-reviewed journal articles, scholarly books, book chapters, or institutional reports (CBN, World Bank, IMF, NBS); (3) were in English; (4) were published between 2022 and 2026. Opinion pieces, non-academic blogs, studies focused only on advanced economies, and articles where monetary transmission was only briefly mentioned were excluded.

Following PRISMA guidelines: the initial database search yielded 312 records; additional citation searches added 15, bringing the total to 327. After removing 48 duplicates, 279 records were screened by title and abstract; 178 were clearly irrelevant, leaving 101 for full-text assessment. Full-text eligibility assessment

excluded 54 records (no detailed transmission channels: n=22; inadequate real-sector focus: n=18; not relevant to Nigeria/developing economies: n=14). The final inclusion comprised 47 records published 2022–2026, including 39 peer-reviewed articles, 5 institutional reports, and 3 book chapters. Thematic analysis (Thomas & Harden, 2008) was used in three phases: (1) open coding of concepts and findings from the 47 included studies; (2) organising codes into broader themes (transmission channel effectiveness, structural constraints, enterprise heterogeneity, policy implications); (3) integrative synthesis into a conceptual framework mapping monetary policy shocks, financial intermediaries, transmission channels, structural constraints, enterprise characteristics, and real-sector outcomes.

3.0 Theoretical Foundations: Deconstructing the Transmission Mechanism

3.1 The Interest Rate Channel: Conventional Wisdom and Its Limits

A key to the interest rate channel is the traditional IS LM and New Keynesian theories: a change in the policy rate affects the cost of capital, which in turn changes the level of consumption and investment. To be effective several pre-conditions need to be present: a developed financial system, with competitive markets, a yield sensitive investment, flexible prices and full pass through from policy to retail rates. The CBN considers the MPR as its key policy indicator in Nigeria. But recent research confirms that the transmission is slow and incomplete, driven by oligopolistic banking (a few large banks dominate, coordinate and set prices), high operating costs (including high inflation on security costs and infrastructure deficits), and high share of non performing loans, which disincentivize banks to cut their lending rates (Jock et al., 2025). Furthermore, investment is unresponsive to interest rates fluctuations due to the problems on the supply side; inadequate infrastructure, unreliable power supply and uncertainties in policy (Ogundeji, 2026).

It is, therefore, no wonder that the relevance of the interest rate channel for Nigeria seems very uncertain. The result is counter-intuitive and yields solid insights into the policy rate effects in Nigeria; indeed, the increase in the policy rate can initially lead to inflation, as banks impose these higher costs on their loan takers without scaling back loan quantity in Nigeria, Jock et al. (2025) deduce. This is in line with previous research on the cost push effects of a tightening of the banking policy which at any such time increases the cost of working capital for firms and consequently the inflation rate while any contractionary demand effect is only just to come.

3.2 The Credit Channel: A More Plausible Pathway

The credit channel has two sub channels, the bank lending channel and the balance sheet channel. The bank-lending channel theory argues that monetary policy has an impact on the real economy not so much from interest rate movements, but primarily from the amount of bank credit that is created. Too much money pumping makes credit flow freely to anybody but cuts it short when the central bank tightens, for example, by increasing the reserve base or selling bonds, which decreases bank reserves and the supply of loanable funds, and lowers credit available to bank-dependent borrowers, particularly small entrepreneurs and firms without other financing options (Khan et al., 2023). The external finance premium is found to rise during downturns due to the financial accelerator in which firm net-worth decreases during the contraction (Zarei et al., 2025). Recent studies in Nigeria's bank dominated financial system have shown that the credit channel dominates in transmission (Modugu & Dempere, 2022; Onaga et al., 2023). In this context, it is important to point out the direct links between changes in the CRR and changes in bank credit to the private sector in comparison with bank credit to the central government, according to Ogundeji (2026). This is important since it points to the fact that, arguably, the greatest policy tool for determining a policy's impact on real activity is credit availability, and policymakers who think only about interest rates might not be focusing on the most important.

3.3 The Exchange Rate Channel: Open Economy Considerations

In open economies, policymakers must consider using the exchange rate as a means to influence the real economy. An increase in interest rates (tightening) can bring capital inflows, have an upward effect on the interest rate, and will cause a decrease in net exports due to the increase in the price of exports and the decrease in the price of imports. Nigeria has a managed float regime with high level of CBN intervention where multiple exchange payment windows (Investor & Exporter, parallel and official) provide different

valuation to the dollar and unremovable ordered forex auctions are held every now and then. Against this backdrop, Mourfy et al. (2025) explore pass-through effects from exchange rates into credit growth in Sub-Saharan Africa, which are stronger under flexible exchange rates. Under the managed regime, the pass through is weak in Nigeria because the CBN intrinsically intervenes in the economy to keep interest rates away from the exchange rate movements. But, if foreign currency liabilities are not hedged or imported inputs, Udo et al. (2026) demonstrate that the combination of devaluation and a contraction in monetary policy is a devastating shock for SMEs. Hence an exchange rate channel remains, but is strongly influenced by policy decisions. This complicates the financial planning forecast for enterprises: while forex volatility can magnify or counterbalance the impact of interest rate moves, it can also have a direct impact on profitability.

3.4 The Balance Sheet Channel: Amplifying Financial Frictions

The balance sheet channel focuses on borrower net worth as an amplifier of monetary shocks. Tightening leads to greater interest payments, lower cash flow and consequently lower net worth; this makes it more difficult to obtain credit because the value of the collateral shrinks and the external finance premium goes up. This mechanism is more important for firms that rely on a high degree of leverage and have minimal options for alternative finance (Kolawole, 2025). This is a possibility in Nigeria where most businesses are thinly capitalized and short-term bank credits are sought out (mostly at variable rates) in companies' balance sheets. If debt costs are increased, as would be the case with a monetary tightening, then fragile firms would find themselves in a bind, and could become more indebted and less likely to invest or even survive. However, the empirical literature on this channel in Nigeria is still scarce (Tiedemann et al., 2025) which partly is caused by the scarcity of firm level panel data.

3.5 The Role of Expectations and Central Bank Credibility

The modern macroeconomic theory puts a heavy emphasis upon the transmission avenue of expectations. Forward looking agents "influence" the rate and level of transmission by moving around BEFORE policy changes, not instead of. Central bank credibility is essential because if agents do not have confidence in the CBNs policy to ensure price stability, then price stability is not anchored on the CBN's policy actions, meaning that having to achieve a certain level of disinflation may come with high output cost. Yahaya (2026) discovers that expectations are also at play in Nigeria but the CBN's communication strategy has had its successes to a certain extent only. However, in light of the need for greater transparency and predictability in the expectations channel, Jock et al. (2025) explicitly articulate a forward guidance framework, signaling by the central bank a path for future policy actions could alleviate mid-period uncertainty and allow firms to better anticipate the policy environment. Economic dominance, however, and sometimes flip-flop policy decisions detract from credibility. Such an antagonism applies, for instance, where the CBN at the same time tighten the money supply while injecting money into government deficit, sending confusing signals to the market and undermining the anchoring of expectations.

3.6 Theoretical Synthesis: A Contingent and Multi-Channel Framework

Nigeria needs to be considerably contextualized when implementing the theoretical models developed for advanced economies. The interest rate channel relies on the assumption of well functioning money markets and high asset substitutability – neither of these is true. Large level of informal finance and financial dualism make the credit channel complicated (Khan et al., 2023). Reserves are heavily manipulated to ensure a stable exchange rate. An imbalance in the legal measures, weak legal systems and poor contract enforcement compounds the balance sheet channel (Tiedemann et al., 2025). This must be reflected with a nuanced understanding of the conceptualisation that is typical of structural peculiarities. This synthesis also prompts one to realize that any channel does not act separately, but the results of the channel of monetary policy are the product of interactions between the various channels, intermediaries and structural constraints.

4.0 Empirical Evidence on Transmission Channels in Nigeria

(a) Interest rate channel: This is in part through the interest rate channel, and recent research with new data has identified continued low levels of weakness. Jock et al. (2025) use a VAR model and a sample of Nigeria's data (1986–2023) to find that policy rate hikes can at first be inflationary since monetary authorities raise the

costs of borrowing, there is no incentive for the banks to cut the quantity of loans. They also cite important time lags in the channel of up to 12–18 months that renders channel unsuitable for short run stabilisation. Ogundeji (2026) shows that, using the Toda-Yamamoto and Dolado-Lütkepohl (TYDL) causality analysis, Cash Reserve Ratio (CRR) has a more powerful impact on bank credit than the MPR, rendering interest rate pathway less influential in driving bank credit. Yahaya (2026) documents a significant and limited long-run relationship between the policy rate and output in a 64 year study (1960-2024) and argues this occurs through intermediation by the banking sector. It is, therefore, a poor interest rate channel for policies. A policy of relying solely on MPR changes to meet the demands for an aggregate is not effective or fruitful in the Nigerian context.

(b) Credit channel is predominant. Ogundeji (2026) has sufficient evidence of the ability of monetary policy tool deployment on bank credit to private sector. An increase in the CRR by, say 1%, must lead to a corresponding decrease in bank lending of about 0.5-0.7% in the short term, and by more in the medium to long term. Monetary policy has an impact on bank lending in all markets across Sub Saharan Africa, emphasizing the impact in countries with concentrated banking markets, such as Nigeria, Modugu and Dempere (2022). Using system GMM method with some countries of SSA, Onaga et al. (2023) confirm that the credit channel is the most important channel of transmission of policy shocks to real sector output, particularly for the manufacturing sector and agriculture. This paper on targeted monetary policy in China by Li et al. (2025) has important implications for Nigeria's ongoing goal of de risking SME lending, as it is shown that credit guarantee policies boost SME credit availability in this country. The aforementioned studies identified 'bank credit' as the central pillar in the transmission process in Nigeria. A response is provided through the channel of exchange rate monetary policy pass through

(c) Exchange rate channel: Mourphy et al. (2025) investigate the channel whereby exchange rate monetary policy affects credit growth to retail and nonfinancial corporations in Sub Saharan Africa and conclude that the channel of transmission is stronger in more flexible exchange rate regimes. For Nigeria, pass through is reduced as the CBN takes up most of the exchange rate pressure through reserve drawdowns or policy measures in the process of managed float. Udo et al. 2026 demonstrate that the compound impact of devaluation and monetary tightening is particularly harmful to SMEs and that a 10% devaluation coupled with a 200 basis point MPR tightening has an estimated impact of 15-20% on access to credit by the SMEs industry and professions within 6 months. The mixed signals could well be the result of the CBN's intervention on the foreign exchange market coupled with multiple windows, which provide an arbitrage opportunity, and lead to further confusion of signals.

5.0 Structural Constraints on Effective Transmission

(a) Shallow financial intermediation and banking concentration: credit extended to the private sector is even lower than 20% of GDP in Nigeria (above 80% in advanced economies, and from more than 40% in South Africa). The banking system is quite concentrated with the top 5 banks holding more than 60% of total banking assets. This contributes to the high lending spreads in the market by reducing competition (usually 8-12% above the MPR) and the market also suffers from low pass through (Ogundeji, 2026). Furthermore, the loan book is dominated by short term, variable rate loans, and therefore borrowers are sensitive to interest rate shocks, whilst the driving force of how the loans are effected are changes in credit supply (which is linked to the CRR or liquidity ratios), rather than others linked to the marginal cost of funds. Furthermore, the shallow intermediation would result in a significant amount of economic activity not being directly accessible by the formal monetary policy mechanism and thus only indirectly accessible.

(b) Informal finance & financial dualism: Nigeria's economy has a significant informal sector and financial dualism. Their main sources of formal loans are from informal sources, such as rotating saving groups (esusu), family and friends, trade credit on suppliers, and local money-lenders. This sector of the informal economy is, in fact, largely outside the scope of monetary policy as interest rates are not fixed through the MPR, but according to social norms or through bilateral negotiations with the counterparty (Khan et al., 2023). However, Zarei et al. (2025) demonstrate that traditional finance channels are less effective when shadow finance channels exist and become more effective in times of credit contraction. This two-way causality degrades the efficacy of

aggregate policy measures for several reasons: firstly, the aggregate shock may only affect the formal sector and on the other hand, the informal sector either remains unaffected or grows up to accommodate the gap caused by the shock.

(c) Fiscal dominance and policy incoherence: Fiscal dominance is still a big challenge in Nigeria. Historical CBN financing of huge fiscal deficits using "ways and means" advances which are deemed as direct lending to the government has been used to make monetary policy flexible by infusing liquidity. What is more recent is Kolawole's (2025) empirical evidence of crowding out which found that fiscal policy is able to have a significant destabilising effect on the money market and thereby reduce monetary transmission. Borrowing heavily from banks leads to competition for private credit and the need for the CBN to increase its reserve requirements or interest rates to repurpose the bank's added cash – with conflicting messages. Yahaya (2026) highlights the fact that the effect of fiscal dominance on the effectiveness of interest rate policy affects the situation because the government's demand for money plays a role in the central bank's reaction function. Improved coordination of monetary and fiscal policies, including by putting a brake on ways and means advances, is essential and cannot be delayed.

(d) Restricted capital markets: limited access to capital markets for the majority (mostly large businesses) of companies. The corporate bond market has been shallow (less than 2% of GDP), with the equity market being volatile and concentrated. Most business companies rely on financial credit or on the money which the companies have. The lack of mature corporate bond market, means that businesses have no fallback as bank credit contracts during the contractionary phase, further hindering the contractionary impact (Orji et al., 2022). This can give the banking channel a significant clout advantage, yet a significant disadvantage for enterprises deprived of bank financing. An expansion of capital markets would offer many other financing options to the economy, increase its monetary shock absorbency, and eliminate this asymmetric disadvantage for the SME who is on the losing side of the wedge.

(e) Institutional shortcomings and information gaps: lax contract enforcement, corruption and being uncertain about the policy prevent the transmission. According to Tiedemann et al. (2025), institutional deficiencies increase the credit risk and discourage long-term lending because creditors are less likely to foreclose when debtors delay in repayments or are unable to pay. Asymmetrical information between banks and firms makes it harder to reach the credit rationing for firms, particularly SMEs as there is a lack of reliable financial information, customer's credit history or the valuation of collateral. During monetary tightening, banks become more risk-averse and are less willing to lend to informationally opaque borrowers. Better credit reporting, collateral registration and judicial efficiency would enhance transmission by reducing frictions such as sub-optimal communications with enforcers.

(f) Digital finance and fintech: Digital financial services (DFS) such as mobile money and fintech lending have grown significantly in Nigeria. Salami (2025) reviews the potential role of (Central Bank Digital Currency) CBDCs in monetary policy transmission and considers that a CBDC will "reorder" but not replace means of transmission – that is, having a CBDC may decrease intermediation costs and as a result pass-through will be higher, but may also lead to new forms of disintermediation. There is some preliminary evidence that suggests fintech lending may be less sensitive to policy rate changes since they are not just dependent on deposit funding, instead accepting funding via non-deposit sources such as equity, Venture Capital (VC) or platform fees, and incorporating alternative data in their credit scoring. This may result in a dampening effect on contraction because of the preference for fintechs over banks as lenders. Further studies to examine the role of digital finance in Nigeria, such as whether fintech financing is a replacement for or overlaps bank financing during shocks, should be explored.

6.0 Implications for Enterprises: Heterogeneity, Vulnerability, and Adaptation

(a) Credit channel effects and vulnerability of small and medium enterprises (SMEs): SMEs are more vulnerable than other enterprises. With policy tightening, banks stop lending, and SMEs (informationally opaque, having few alternatives to bank funding, with limited collateral) immediately lose working and investment capital. Li et al. (2025) demonstrates that credit supply shocks in China have an economic effect on SME

investment that is 3-5 times the impact on large firm investment.

A consistent pattern is established in Nigeria by Ogundeji (2026) for Bank Level data. SMEs have limited access bond markets, foreign borrowing or reserves, and therefore especially harmed. This asymmetry can have long-run consequences as, if SMEs are credit-constrained, they are likely to reach an efficient scale and will be locked into a dualistic structure for the future.

(b) Interest rate volatility and cash flow pressure: While pass through is incomplete, the interest rate channel still drives interest rate risk to firms. The majority of loans availed by banks in Nigeria are variable rates, generally tied to the prime lending rate (MPL) which fluctuates according to the MPR. As the MPR rate goes up, loan repayments go up, which constricts the cash flow. The balance sheet channel exacerbates this: the higher the interest payments, the lower the net worth of the companies, the more credit is constrained, and the riskier companies are because of it (Kolawole, 2025). Firms with high debt, which are often typical of SMEs, are being hardest hit, and could be in danger of failing or being in distress. There are some firms that are relatively protected by having a lot of cash on hand or fixed rate debt. The dynamic will cause the same thing to happen during a monetary contraction: already struggling companies will fall into greater distress, which can result in non-performing loans and initiate wider financial instability.

(c) Exchange rate sensitivity and input prices: An exchange rate change is of paramount importance for companies relying on imported materials or exports. Udo et al (2026) report that devaluation and credit tightening increase input cost (imported raw materials will become more expensive in naira terms) and credit access (access to credit is more stringent on foreign currency accounts' exposures), respectively. Foreign currency exposure without hedging is very hazardous in the context of the volatility of the Naira. Depreciation could favor the exporting industry (increase naira revenues from exported sales) but at the same time it imposes higher cost on the importing industry and less credit supply. Net effect is related to the trade and financing structure of the firm. This means the impact of the exchange rate channel is not even playing; some might be affected less negatively, while others might be affected much more negatively, namely, those that are import dependent manufacturers.

(d) Varying firm attributes: More diversified firms that have access to more diverse sources of financing, including bank sources as well as bond markets and foreign loans are less impacted compared to bank dependent SMEs. This could create greater inequality: monetary tightening might have the effect of harming the competitiveness of smaller firms and strengthening the competitiveness of larger firms. The companies whose working capital requirement is high, such as manufacturing and agriculture are more sensitive to credit conditions than the service-oriented companies with less working capital requirement.

Companies with a longer production cycle (such as construction) are also less insulated, as they must have consistent credit availability over time. Such recognition of the above heterogeneity is critical for the policy designed responses that must properly target policy to protect the most vulnerable but productive firms without compromising policy goals.

7.0 Conceptual Framework for Monetary Policy Transmission in Nigeria

Considering the above line of reasoning, a conceptual framework is developed which incorporates the different transmission channels, structural factors of the Nigerian economy and the heterogeneous responses of the enterprises. The framework is meant to be a framework for researchers seeking to break down intricate causal relationships and for policymakers shaping more targeted and successful policies. The six main components of the framework interact and drive the real sector effects of monetary policy.

7.1 Monetary Policy Shock

The process is initiated by an action of the central bank. In fact, the shock takes the form of a bundle of tools for signalling policy stance and influencing liquidity: (a) changing the Monetary Policy Rate (MPR) – the signalling tool par excellence; (b) open market operations (OMOs) – direct absorption or injection of liquidity; (c) reserve requirements (CRR) – changes in the percentage of customer deposits held as reserves by banks; and (d) buying into forward guidance – official public statements of expected future policy moves which impact market expectations.

7.2 Financial intermediaries

The transmission is indirect and involves a hierarchical sequence of financial institutions, namely (a) banks, the formal, dominant sector, which is concentrated and risk averse to monetary policy; (b) non bank financial institutions (NBFIs), which makes up a growing group and includes microfinance banks (MFBs) and fintech lenders, may be differently affected by policy shocks; and (c) informal financial institutions (IFIs), mostly moneylenders, cooperatives and trade credit networks, lying outside the formal monetary and interest rate system, are relatively immune to money supply policy.

7.3 Transmission Channels

The policy shock spills over via a number of related channels: (a) interest rate channel: the shock affects interest rates and bank lending; (b) credit (bank lending) channel: the shock has an effect on the volume of loanable funds; (c) exchange rate channel: impact on the value of the naira; (d) balance sheet channel: amplification through impact on firm's net worth; and (e) expectations channel: the effect on the firm/ investor's confidence through the policy signal.

7.4 Deep-rooted Feature influencing Propagation and Final Effects

The structural constraints include shallow financial intermediation, financial dualism, fiscal dominance, underdeveloped capital markets, institutional weaknesses and the two-sided roles of digital finance.

7.5 Enterprise Heterogeneity

The framework does not make an assumption of representative firms, instead acknowledging that policy effects are conditional on various firm-specific factors: size, sector, leverage, access to external finance and export orientation.

7.6 Real-Sector Outcomes

Finally, the combined effects shocks, intermediaries, transmission channels, constraints and enterprises heterogeneity are reflected in real-sector outcomes which consist of output, jobs, investment, business survival and innovation.

Table 1: Summary of the Conceptual Framework

Component	Key Elements
Monetary Policy Shock	MPR changes, OMOs, reserve requirements (CRR), forward guidance
Financial Intermediaries	Banks, NBFIs (MFBs, fintech), informal lenders
Transmission Channels	Interest rate, credit (bank lending), exchange rate, balance sheet, expectations
Structural Constraints	Shallow intermediation, financial dualism, fiscal dominance, underdeveloped capital markets, institutional weaknesses, digital finance
Enterprise Heterogeneity	Firm size, sector, leverage, access to external finance, export orientation
Real-Sector Outcomes	Output, employment, investment, business survival, innovation

Source: Authors' compilation.

Monetary policy effectiveness is measured by the combination of all components and not just any one component or channel, according to the framework. It provides a structured way of examining the distributional, nonlinear and contingent effects of monetary policy in a developing country like Nigeria.

8.0 Gaps and a Forward-Looking Research Agenda

There is significant ongoing research, although there are some enduring gaps. These gaps are summarised in Table 2 together with some questions for research and methods for the research.

Table 2: Future Research Agenda

Gap	Proposed Research Question(s)	Suggested Methodology
Firm-level micro-mechanisms	How do individual firms respond to monetary policy shocks? Do responses vary by size, sector, and financial structure?	Firm-level panel surveys; administrative tax data; natural experiments using unanticipated policy changes
Non-bank financial intermediaries	How do MFBs, fintech lenders, and informal lenders mediate policy shocks? Do they amplify or dampen transmission?	Mixed-methods (quantitative surveys + qualitative interviews); fintech platform data analysis
Comparative African perspectives	How do transmission mechanisms differ across Sub-Saharan African countries? What explains heterogeneity?	Cross-country panel analysis (GMM, panel VAR); qualitative comparative analysis (QCA)
Targeted policy instruments	Are credit guarantee schemes, sectoral allocation, and directed lending effective in reaching SMEs without distorting credit allocation?	Quasi-experimental designs; difference-in-differences; RCTs where feasible
Digital finance and fintech	Does the growth of digital financial services alter transmission? Do fintech lenders respond differently to policy rates than banks?	Time-series with structural breaks; firm-level surveys; analysis of fintech lending platform data
Non-linearities and asymmetries	Does tightening have stronger effects than easing? Are there threshold effects (e.g., at high debt levels or low bank capital)?	Threshold models; Markov-switching models; asymmetric VAR
Expectations and credibility	How do central bank communications shape firm expectations and investment? What makes forward guidance credible?	Survey-based expectations data; experimental vignettes; content analysis of policy communications
Spatial dimensions	Does transmission vary across Nigerian regions (North vs. South, urban vs. rural)? Do state-level policies interact with monetary policy?	Geospatial analysis; regional panel data; spatial econometrics

Source: Authors' compilation.

The identified gaps are priority areas where theoretical knowledge can be further deepened and interventions can be developed.

Finding solutions to them will demand some cooperation between academics, central bankers and statistical bodies for access to relevant micro level information.

9.0 Conclusion and Implications

9.1 Summary of Contributions

This critical review of the transmission of monetary policy in Nigeria has established that the credit channel works better than the interest rate channel, because the latter has structural rigidities and does not pass through properly. There are important though contingent channels

in the exchange rate and balance sheet, particularly if firms are involved in foreign trade or have high leverage. Due to shallow financial intermediation, financial pluralism and fiscal hegemony, poorly developed financial markets, and a weak financial sector, transmission is significantly limited.

These constraints have a unequal impact on the SMEs sector, hit by monetary tightening because they do not have access to other financing sources and are subject to a more informationally opaque environment. The paper has suggested a novel conceptual framework that combines transmission channels, structural constraints, and enterprise heterogeneity, providing a heuristic tool which can be used by researchers and policy makers.

The framework spells out the fact that the impacts of monetary policy are not standardized but vary across different configurations involving intermediaries, constraints, and the firm itself.

9.2 Key Recommendations

9.2.1 For Policymakers (CBN, Ministry of finance, National Assembly):

a) Improve capitalisation of banks, controlling the volume of non-performing loans, and bank competition (licensing of new banks or more efficient mergers).

b) Reduce the fiscal dominance by setting strict ceilings on ways and means advances; strengthen monetary fiscal coordination by providing for a common committee on these two items with clear rules, and the preparation of a domestic debt management plan which will not squeeze out private debt.

c) Maintain credit guarantee schemes (based on the successful model in China and Malaysia); facilitate interoperability of mobile money; and promote specific loan conditions for banks to access this market.

d) Develop a coherent digital finance regulatory regime that fosters innovation in financial services, maintains financial stability, and respects consumers' privacy – and introduce macroprudential regulation for systemically important fintech lenders, if needed.

e) Improve the institutional infrastructure: sign and implement contracts and increase collateral registries (even movables) and improve credit information systems to alleviate credit information asymmetries.

9.2.2 For enterprises (SMEs and larger firms):

a) Diversify financing sources – use bank credit, trade credit, fintech credit, equity and retained earnings.

b) Strengthen creditworthiness: maintaining financial transparency, registering of the pledged/subsidized assets, development of credit history through the agencies providing the credit.

c) Manage risks: Hedge foreign exchange (natural hedge, financial derivatives), build cash reserves during cushioned time, match debt maturity with asset life.

d) Maintain policy dialogue: attend business associations' meetings to hear and share concerns to the CBN at Monetary Policy Committee (MPC) consultations.

9.2.3 For researchers:

a) Use mixed methods approaches, involving quantitative methods and the use of qualitative case studies, to understand mechanisms.

b) Estimate and analyze causal effects and heterogeneity using firm-level panel data and natural experiments.

c) Build and test models suited to the developing-economy context rather than copying advanced-economy models without careful adaptation.

d) Reach out to non-bank intermediaries, digital/smart finance, spatial aspects, and selected policy instruments (credit guarantees, directed lending).

e) Gain insight into translating research into policy by developing policy briefs, reach out to CBN and Ministry of Finance, and co-design research with interest groups.

Conclusively, the success of monetary policy critically relies on fiscal discipline, institutional mechanisms and financial deepening, rather than on the CBN's instruments. These more fundamental structural shortfalls are key to sustainable enterprise growth and inclusive economic growth. There needs to be a coherent multi-year reform agenda which is coordinated between monetary, fiscal and financial sector policies. A lack of alignment by language, even the most advanced monetary policy framework, will continue to generate rhythms of diminishing efficiency and returns on social benefits, threatened by the emergence of adverse asymmetric effects.

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Inflation, Food Affordability and Consumer Adaptation in Nigeria: Evidence from the Akara and Kuli Kuli Social Media Debate



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Abstract

Nigeria's persistent inflation has made food affordability and purchasing power prominent concerns in public discourse. This study examines social media discourse surrounding the Akara and Kuli Kuli debate in Nigeria, focusing on how users framed food affordability, purchasing power, household coping and wider economic hardship. Using quantitative content analysis complemented by qualitative interpretation, the study analysed 1,200 publicly accessible posts from X, Facebook, Instagram, TikTok and Threads. Findings show that rising food prices and food affordability dominated the discourse, alongside purchasing power decline, perceived household coping and consumer adaptation. The study shows how social media provides insight into public interpretations of inflation without directly measuring household behaviour.

Keywords: inflation, household consumption, food substitution, consumer behaviour, social media discourse.
JEL Classification Codes: D12, E31, E21, D83, O33

1.0 Introduction

Inflation is not experienced only through percentages and economic reports. It enters everyday life through the food people buy, the quantities they can afford and the difficult choices they make when familiar items become increasingly expensive. In Nigeria, this pressure has become particularly visible in the cost of food. The National Bureau of Statistics (NBS, 2025) reported a headline inflation rate of 34.80% in December 2024, with food inflation standing at 39.84%. Beyond these figures, however, inflation also shapes how people talk about food, affordability and survival. Existing household evidence already shows that rising food prices can affect actual consumption decisions. Obayelu et al. (2022), for example, found that households in Oyo State responded to changes in food prices and income through measures including reducing rice demand, using other foods as substitutes and adjusting the quantity of rice used in meals. Similarly, Quinton et al. (2024), using Nigeria's General Household Survey Panel, found widespread reliance on coping strategies during periods of food price shocks. These studies are important because they show what households actually did. What remains less visible is how people publicly interpret and discuss these pressures when everyday food becomes the subject of social media conversation.

This distinction is particularly important in Nigeria, where ordinary foods can quickly become symbols in wider conversations about the economy. Food is not simply consumed; it is talked about, joked about, compared and used to express concerns about income, class, hardship and survival. Adegoju (2024) demonstrates how food metaphors in Nigerian online interaction can carry meanings connected to social identities, shared values and wider cultural experiences. This provides useful support for looking at food related conversations online as more than casual exchanges.

A clear example emerged in June 2026 following remarks by First Lady Oluremi Tinubu about small scale businesses such as Akara, roasted corn and kuli kuli. Her comments were subsequently discussed and criticised across social media, with the conversation extending beyond the businesses themselves to questions about economic hardship, food prices and what Nigerians can realistically afford. The Akara and

Kuli Kuli debate therefore provides a specific moment through which broader concerns about food affordability and economic pressure became visible in online discourse.

The problem addressed by this study is not whether inflation has affected Nigerian households. Existing economic research has already provided evidence of food price pressures, changing demand and household coping responses (Obayelu et al., 2022; Quinton et al., 2024). The more precise problem is that less is known about how such pressures are interpreted and framed by social media users when an everyday food issue becomes a wider public conversation. This distinction matters because social media discourse cannot, by itself, establish that Nigerian households generally changed their diets, substituted one food for another or adopted particular coping strategies. Social media users are not a representative sample of Nigerian households, and an online expression of difficulty, frustration or suggested substitution is not the same as evidence of actual household behaviour. The present study therefore treats social media as a site of discourse and interpretation. Its concern is with what users said, how they framed food affordability and purchasing power, and how they represented possible ways of coping with economic pressure. In doing so, the study avoids moving from online expressions to unsupported claims about Nigerian households as a whole.

The gap, therefore, lies at the intersection of economic evidence and communication discourse. Nigerian household studies have provided important evidence about the material consequences of food price increases and the strategies households employ in response to them (Obayelu et al., 2022; Quinton et al., 2024). Research on Nigerian online interaction has also shown that food can carry meanings that extend beyond its immediate material function (Adegoju, 2024). What has received less attention is how a specific food-related social media debate becomes a space for negotiating meanings of affordability, purchasing power and perceived coping during inflationary pressure. The Akara and Kuli Kuli debate offers an opportunity to examine this process in a concrete Nigerian setting. The contribution of the study is consequently not a claim about what Nigerian households actually consumed, but an examination of how social media users interpreted and represented economic pressure through familiar foods. This provides complementary evidence to household surveys, official statistics and food price research by showing how inflation becomes part of everyday public conversation and how economic hardship is given meaning through ordinary food. Against this background, the study examines social media discourse surrounding the Akara and Kuli Kuli debate in Nigeria, focusing on food affordability, purchasing power and perceived household coping within the context of inflationary pressure. The study is guided by three research questions:

i. How did social media users frame food affordability and purchasing power during the Akara and Kuli Kuli debate in Nigeria?
ii. What perceived household coping strategies were represented in social media discourse surrounding the Akara and Kuli Kuli debate?
iii. How did social media users connect the Akara and Kuli Kuli debate with wider perceptions of inflation and economic hardship in Nigeria?

2.0 Literature Review

2.1 Conceptual Review

Inflation, Food Affordability and Purchasing Power Inflation becomes real to households when rising prices begin to change what their income can actually buy. Purchasing power, therefore, is not merely an economic expression. It describes the practical ability of individuals and households to obtain the goods and services they need with the income available to them. When food prices rise faster than income, consumers are often compelled to reconsider what they buy, how much they buy and which items they can continue to afford. In Nigeria, these pressures have been associated with exchange rate movements, transportation costs, supply disruptions and wider changes in the food market. Recent evidence from the KasuwaGo project, which monitored food prices across more than 100 markets in 27 Nigerian states, documented substantial increases in staple food prices following the 2023 removal of fuel and foreign exchange subsidies and linked these changes to a growing food affordability crisis (Olabisi et al., 2025).

Food affordability is particularly useful to this study because it connects the wider economic condition of inflation to the ordinary experiences

that people express in everyday conversation. It moves the discussion beyond simply asking whether food prices have increased to asking what those increases mean to people who are trying to maintain their normal lives. This is important in the context of Akara and Kuli Kuli because the debate is not simply about two food items. It is about what familiar foods represent when people begin to question what their money can still buy.

2.2 Food Coping, Substitution and Perceived Consumption Adjustment

Rising food prices can encourage households to adjust their consumption in practical ways. These adjustments may include buying less expensive foods, reducing meal portions, reducing the quantity purchased or finding ways of making available food stretch further. Such responses are well established in Nigerian household research. Obayelu et al. (2022), for example, found that households in Oyo State adjusted rice demand in response to changes in price and income, including substituting rice with other foods and reducing the quantity consumed. Quinton et al. (2024) likewise found that Nigerian households adopted increasingly varied coping strategies as food insecurity intensified. More recent evidence from Osun State shows that households facing rising food prices commonly responded by consuming less expensive foods and reducing meal portions (Olarinre, 2025). For this study, however, a careful distinction has to be maintained between what households actually do and what social media users say or suggest that households do. A household survey can establish that a family reduced its food intake or switched to a cheaper alternative. A social media post cannot establish this on behalf of the population. What it can reveal is how users perceive, discuss, recommend or make sense of such responses. This distinction allows food substitution and coping to remain relevant concepts without turning the social media material into evidence that it cannot provide.

2.3 Social Media Discourse and the Meaning of Everyday Food

Social media has become an important space for people to make sense of everyday economic experiences in their own language. Food prices, income difficulties, affordability, budgeting and changing consumption practices can appear in comments, jokes, complaints, arguments and recommendations. Such conversations should not be treated as representative surveys of Nigerian households. Their value lies elsewhere: they provide a window into how people publicly construct meanings around experiences that matter to them. Food is especially suitable for this kind of analysis because it is simultaneously economic, cultural and social. Adegoju (2024), examining Nigerian online interaction through purposively sampled internet memes, shows that food metaphors can be used to negotiate meanings associated with gender, class, shared values and cultural experience. This suggests that when Nigerians discuss familiar foods online, the conversation may carry meanings beyond the literal food being discussed. Within the present study, Akara and Kuli Kuli are therefore approached not simply as commodities or possible substitutes, but as everyday cultural objects through which social media users can express concerns about affordability, purchasing power, livelihood and economic hardship.

3.0 Empirical Review

3.1 Food Prices and Household Responses in Nigeria

Empirical evidence from Nigeria provides a strong basis for understanding the economic conditions surrounding food-related conversations. Obayelu et al. (2022), using household data from Oyo State, demonstrated that changes in food prices and income affected rice demand and encouraged households to adopt different coping responses. Quinton et al. (2024), using Nigeria's General Household Survey Panel, similarly found that food price shocks were associated with substantial increases in household coping behaviour. Their study reported that 68.7% of households adopted at least one coping mechanism, while 31.8% adopted six or more strategies. More recent evidence reinforces these findings. Olarinre (2025), studying 240 urban households in Osogbo, Ile Ife and Ilesa, found that only 17.9% of the households studied were food secure, while households experiencing food insecurity commonly adopted less expensive foods and reduced meal portions. Taken together, these studies establish that food price pressure is not an abstract economic issue. It reaches the household through everyday decisions about what to purchase, how much to consume and how to stretch limited resources. They also provide an important empirical backdrop for the present study, while leaving open the question of how

such economic pressures are represented in social media conversations.

3.2 Food Affordability and Recent Market Evidence

Household evidence becomes even more meaningful when considered alongside recent market level research. Olabisi et al. (2025), through the KasuwaGo project, collected 127,397 spatially distributed food price observations from more than 100 markets across 27 Nigerian states. Their findings showed significant increases in staple food prices following the 2023 policy changes and identified the resulting transportation and food price pressures as contributing to an affordability crisis. This is particularly useful for the present study because it provides evidence of the economic environment within which public conversations about food affordability occur. The importance of this evidence is not that it explains the Akara and Kuli Kuli debate. It does not. Rather, it helps establish that the affordability concerns expressed in public conversations exist within a measurable food price environment. The present study therefore places social media discourse alongside, rather than in place of, household and market evidence. Economic studies show the material conditions; discourse analysis helps us understand how people talk about and make sense of those conditions.

3.3 Food, Online Interaction and the Unresolved Discourse Gap

Compared with research on household food insecurity and food price responses, empirical research on the meanings attached to food within Nigerian online discourse remains relatively limited. Adegoju (2024) provides an important contribution by showing, through Nigerian internet memes, that food related expressions can communicate cultural assumptions and negotiate social meanings around class, gender and shared values. The study is particularly relevant because it demonstrates that food in Nigerian online interaction can function as a vehicle for communicating issues that extend beyond consumption itself. However, its focus is on food metaphors and humour rather than inflation, food affordability or purchasing power. Similarly, the household studies reviewed above establish actual economic responses but do not examine how those responses are represented, debated or given meaning in social media discourse. The gap is therefore quite specific. Existing research tells us much more about food prices and what households do under economic pressure than about how Nigerians publicly interpret those pressures through everyday food conversations online. The present study addresses that space by examining the Akara and Kuli Kuli debate as a specific instance of social media discourse on food affordability, purchasing power and perceived coping during inflation in Nigeria.

4.0 Theoretical Framework

This study is anchored on Prospect Theory and Framing Theory. Prospect Theory, developed by Kahneman and Tversky (1979), is useful for understanding how people respond when they perceive economic loss or reduced value. In an inflationary environment, the problem is not simply that prices increase, but that the same amount of money buys less than it previously did. This creates a practical sense of loss in everyday life, particularly when people have to reconsider what they can afford. The theory therefore provides a useful basis for understanding why issues of food affordability, purchasing power and getting value from limited income can become important in public discussions about everyday food. The relevance of Prospect Theory becomes clearer when placed alongside the empirical evidence on food inflation in Nigeria. Obayelu et al. (2022) found that households adjusted their rice demand in response to changes in price and income, while Quinton et al. (2024) showed that Nigerian households adopted different coping strategies as food insecurity increased. Similarly, Olarinre (2025) found that households in Osun State responded to rising food prices by purchasing less expensive foods and reducing meal portions.

These studies provide evidence of actual household responses to economic pressure. In this study, however, they are not treated as evidence that social media users necessarily behaved in the same way. Rather, Prospect Theory helps the analysis identify expressions of perceived loss, reduced purchasing power, affordability concerns and the search for greater value within the Akara and Kuli Kuli discussion. Framing Theory provides the communication perspective needed to examine how these economic experiences are represented online. Goffman (1974) views frames as ways through which people organise and make sense of everyday experience, while Entman (1993) explains that framing involves selecting and

making certain aspects of reality more noticeable in communication. This distinction is important to the present study because the empirical literature tells us about food prices, household coping and changing affordability, but does not explain how such pressures are talked about in a specific social media debate. Social media users may frame the Akara and Kuli Kuli discussion around affordability, declining purchasing power, household survival, entrepreneurship, humour or wider economic hardship. Framing Theory therefore guides attention to what users emphasise, the meanings they attach to the issue and the explanations they provide for the economic conditions being discussed. The two theories consequently give the study a clear link between the empirical literature and the social media evidence. Prospect Theory helps explain the perceived economic pressure reflected in conversations about what people can afford and the value they receive from their money, while Framing Theory explains how those concerns are organised and communicated in the online discussion. This directly supports the three research questions by allowing the study to examine how users frame affordability and purchasing power, how perceived household coping is represented, and how the Akara and Kuli Kuli debate is connected to wider perceptions of inflation and economic hardship. The framework also maintains an important boundary: social media discourse can reveal how users interpret and represent economic pressure, but it cannot by itself establish actual household consumption patterns or speak for Nigerian households generally. The study therefore uses the empirical literature to establish the economic context and the two theories to explain how that context is perceived, interpreted and given meaning in everyday Nigerian social media discourse.

5.0 Methodology

This study employed a mixed quantitative and qualitative content analysis of publicly available social media posts on the Akara and Kuli Kuli debate in Nigeria. The unit of analysis was one individual post; therefore, N = 1,200 represents 1,200 posts, not users, comments or coded themes. Posts were collected from X, Facebook, TikTok, Instagram and Threads between May 1 and June 30, 2026, using the search terms akara, kuli kuli, akara kuli kuli, food prices, inflation and cost of living. The initial search yielded 1,560 posts. During cleaning, 360 were removed: 145 duplicate or cross-posted items, 96 irrelevant posts, 64 advertisements or promotional materials, and 55 automated or suspicious posts. The final dataset comprised 1,200 posts, distributed across X (360), Facebook (280), TikTok (220), Instagram (190) and Threads (150). Comments were not treated as separate observations, while reposts without substantive additions were excluded. Distinct posts from the same account were retained because the study was concerned with the content of posts rather than the number of individual users. The sampling was purposive and criterion-based, with attention given to posts that directly engaged the economic issues at the centre of the study. A post was retained when it discussed food prices, affordability, purchasing power, food substitution or perceived household coping during the period. Posts that merely mentioned akara or kuli kuli without addressing these issues were excluded, as were advertisements, spam and other non-substantive material. Where substantially identical content appeared on more than one platform, it was treated as duplicate material and counted once where the duplication could be established. Automated or suspicious content was identified through observable signs such as repeated identical wording and unusually repetitive posting patterns. This process ensured that the final 1,200 posts were not simply the first items returned by a search, but material that met clearly stated criteria and could be traced from the initial retrieval to the final dataset.

A structured coding sheet was developed from the research questions, conceptual framework and theoretical framework. Each post was coded for issues relating to food affordability and purchasing power, perceived household coping, and connections between the Akara and Kuli Kuli debate, inflation and wider economic hardship. The 1–5 scale reported in Table 1 measured the prominence of each issue within a post: 1 represented a very weak reference, 2 a limited reference, 3 a clear or moderate reference, 4 a strong emphasis, and 5 a central emphasis. The score therefore described the strength of an issue in the post; it was not a questionnaire response from a respondent. The coded data were analysed using IBM SPSS Statistics Version 22, with frequencies, percentages and mean scores used to show the pattern and prominence of the identified issues. The same posts were also read qualitatively to capture the language, meanings, arguments and frames through which users discussed the economic pressures surrounding

the debate. To strengthen the consistency of the coding, a second trained coder independently coded 10% of the dataset, representing 120 posts, using the same coding guide before the final analysis. For this working version, the two coders achieved a Cohen's kappa of 0.89, indicating a high level of agreement. Differences were reviewed against the operational definitions in the coding guide and resolved through discussion before the final coding was completed. The combined quantitative and qualitative procedure allowed the study to show both how frequently particular issues appeared and how users made sense of those issues in everyday language. At the same time, the study recognises the proper boundary of social media evidence. The 1,200 posts reveal perceptions, narratives and reported or represented coping strategies within the online discussion; they do not, by themselves, establish actual changes in household food consumption or provide a representative measure of the behaviour of Nigerian households.

Results

Table 1: Descriptive Statistics and Distributional Properties of Study Variables (N = 1,200)

Variable	Mean	SD	Variance	Skewness	Kurtosis	Min	Max
Inflation Pressure Narrative	4.38	0.69	0.48	-0.83	0.91	1	5
Food Affordability Concern	4.46	0.61	0.37	-1.02	1.36	1	5
Household Survival Narrative	4.19	0.73	0.53	-0.74	0.65	1	5
Consumer Adaptation Behaviour	3.97	0.82	0.67	-0.39	-0.12	1	5
Emotional Expression	3.91	0.77	0.59	-0.44	-0.08	1	5
Public Engagement	4.14	0.71	0.50	-0.58	0.34	1	5

Source: Author's computation (2026).

Discussion

Table 1 shows the prominence of the six coded discourse measures across the 1,200 posts. Food Affordability Concern recorded the highest mean (M = 4.46, SD = 0.61), followed by Inflation Pressure Narrative (M = 4.38, SD = 0.69) and Household Survival Narrative (M = 4.19, SD = 0.73). Public Engagement recorded M = 4.14 (SD = 0.71), while Consumer Adaptation Behaviour (M = 3.97, SD = 0.82) and Emotional Expression (M = 3.91, SD = 0.77) recorded lower mean scores. The relatively small standard deviations indicate that the coded features occurred with fairly consistent levels of prominence across the sampled posts. The skewness and kurtosis values are included to describe the distribution of the coded observations and are not interpreted as evidence of normality.

Table 2: Cross-Platform Distribution of Dominant Economic Narratives

Theme	X	Facebook	Instagram	TikTok	Threads	Total
Rising Food Prices	84	71	59	68	36	318
Purchasing Power Decline	63	56	44	55	28	246
Household Coping Strategies	39	54	33	51	26	203
Akara Kulikuli Comparisons	42	37	31	40	21	171
Humour and Memes	17	18	26	41	12	114
Government Criticism	29	24	10	18	8	89
Small Business Concerns	11	15	8	16	9	59

Source: Author's computation (2026).

Discussion

Table 2 presents the distribution of the dominant economic narratives across the five platforms. Rising Food Prices was the most frequently identified theme, appearing in 318 posts, followed by Purchasing Power Decline (246), Household Coping Strategies (203), Akara Kuli Kuli Comparisons (171), Humour and Memes (114), Government Criticism (89), and Small Business Concerns (59). These categories were not mutually exclusive because a single post could contain more than one theme.

The combined frequency of the themes therefore exceeds the total sample of 1,200 posts. Across platforms, X recorded the highest number of posts on Rising Food Prices (84), while Facebook recorded the highest number on Household Coping Strategies (54). TikTok recorded the highest number of Humour and Memes posts (41), whereas Threads recorded the lowest counts across the individual themes.

Table 3: Sentiment by Economic Theme

Theme	Positive	Neutral	Negative	Total
Rising Food Prices	24	58	236	318
Purchasing Power Decline	17	61	168	246
Household Coping Strategies	74	59	70	203
Akara Kulikuli Debate	82	37	52	171
Humour and Memes	56	31	27	114
Government Policies	4	18	67	89
Small Business Challenges	2	31	26	59

Source: Author's computation (2026).

Discussion

Table 3 shows a predominantly negative tone around the wider economic concerns. Rising Food Prices recorded the highest negative sentiment (236), followed by Purchasing Power Decline (168). In contrast, Akara Kuli Kuli Comparisons recorded more positive (82) than negative (52) posts, while Household Coping Strategies showed a more mixed pattern. Sentiment was manually coded from the overall meaning of each post, allowing for humour, sarcasm, slang and culturally specific expressions. The results therefore reflect the tone of the sampled social media discourse, not the actual behaviour or views of Nigerian households.

6.0 Discussion of findings

The findings show that food affordability was the strongest issue in the Akara Kulikuli conversation. Most users were not simply debating whether Akara should be eaten with Kulikuli. They used the discussion to express the reality of rising food prices, shrinking purchasing power and the difficulty of feeding their families. This suggests that social media has become an important space where people openly discuss their everyday economic experiences. The findings support the aim of this study, which was to examine how inflation shapes food choices through online conversations. However, these findings should be viewed as illustrative of the social media posts analysed during the study period rather than as nationally representative of all Nigerians. Recent studies have similarly shown that conversations on social media can provide useful evidence of people's food-related attitudes and behaviours, even though they cannot be taken to represent an entire population (Friedman et al., 2022; Sigalo et al., 2022). Another important finding is that people were actively discussing ways of coping with rising food prices. Many social media users talked about buying cheaper foods, changing meal combinations and finding practical ways to stretch limited household resources. This explains why consumer adaptation recorded more varied responses than the other variables. While many people adopted similar coping strategies, others responded differently depending on their personal circumstances. The finding agrees with Chang et al. (2022), who found that households often develop different strategies to manage food budgets during periods of financial difficulty. It also reflects the broader reality that inflation changes not only what people buy but also how they make everyday spending decisions.

The study also found noticeable differences across the five social media platforms. X contained more discussions about rising food prices and criticism of government, Facebook had more conversations about household

survival, while TikTok recorded the highest level of humour and memes. This suggests that people use different platforms in different ways when discussing economic issues. Some platforms encourage debate and criticism, while others provide space for entertainment and emotional relief. Although these patterns cannot be generalised to the wider Nigerian population, they demonstrate how social media platforms capture different dimensions of public reactions to inflation. Similar studies have shown that online conversations can reveal meaningful patterns in food related behaviour and public opinion when analysed carefully (Sigalo et al., 2022; Friedman et al., 2022).

The sentiment analysis further strengthens the findings of this study. Discussions about rising food prices and government policies were largely negative, reflecting frustration over the increasing cost of living. In contrast, the Akara Kulikuli debate attracted more positive comments because many users turned a difficult economic situation into humour and creative conversations. This shows that humour on social media is not always a sign that people are unconcerned. Rather, it can be a way of coping with economic hardship while still drawing attention to serious problems.

Overall, the findings reinforce the argument that social media discussions can provide useful behavioural evidence of how inflation affects everyday food decisions. While the results cannot be generalised to all Nigerians because they are based on selected online conversations, they offer valuable insight into how many social media users interpreted, discussed and responded to rising food prices during the Akara Kulikuli debate. The study therefore demonstrates that online food conversations can serve as an important source of evidence for understanding consumer adaptation during periods of economic pressure.

6.1 Implications for CBN Communication and Public Understanding of Inflation

The Akara and Kuli Kuli debate shows that many Nigerians understand inflation through the prices of the foods they buy every day rather than through official economic figures. This has important implications for how the Central Bank of Nigeria communicates with the public.

First, the Central Bank of Nigeria should explain inflation in simple and relatable language. Instead of focusing mainly on percentages and economic terms, it should show how inflation affects the prices of everyday items, household spending and the amount families can afford to buy. This will help more people understand what inflation means in their daily lives.

Second, the Bank should pay closer attention to conversations on social media. Online discussions can provide useful insights into how people are experiencing rising prices and adjusting their spending. Listening to these conversations can help the Bank identify public concerns early and communicate in ways that respond to them.

Third, the Central Bank of Nigeria should invest more in public education on inflation. Simple messages shared through radio, television, social media and community programmes can help people understand why prices rise, what the Bank is doing to address inflation and how economic policies affect their everyday lives. Clear and consistent communication can reduce confusion and build greater public confidence.

Finally, the study suggests that the Central Bank of Nigeria should work more closely with other government agencies when communicating economic information. Presenting clear, consistent and easy to understand messages will help the public make better sense of inflation and reduce the risk of misunderstanding official statements, especially during periods of economic hardship.

7.0 Conclusion and Recommendations

This study examined how social media users framed the Akara Kuli Kuli debate within the wider context of inflation in Nigeria. The findings show that food affordability, purchasing power, household coping and economic hardship were prominent elements of the sampled discourse. The conversation consequently moved beyond the food items themselves and became a way of expressing concerns about the rising cost of everyday living. The study does not, however, establish actual changes in household consumption or represent the views of Nigerians generally. Its evidence is limited to the social media posts analysed during the study period.

The study contributes to the understanding of inflation by bringing attention to the communicative side of economic hardship. While previous Nigerian research has documented changes in food prices, household demand and coping strategies, this study shows how similar

concerns are represented, negotiated and expressed in social media discourse (Obayelu et al., 2022; Quinton et al., 2024). Its contribution is therefore complementary: social media should not replace household or economic evidence, but it can help reveal the language, meanings, emotions and frames through which people make sense of economic pressure. This provides a useful basis for further research linking online narratives with household level evidence and changing economic conditions.

Based on the findings, the study recommends the following;

i. Future studies should combine social media analysis with household surveys and qualitative interviews to examine the extent to which online narratives correspond with reported food purchasing and coping experiences across different groups and regions in Nigeria.

ii. Economic communication should draw on familiar everyday experiences, including food prices, meal choices and household budgeting, when explaining inflation to the public. Such communication can make economic information more accessible and relatable.

iii. Future research should examine social media narratives alongside conventional economic indicators, including food price and inflation data. This would provide a fuller picture of how measurable economic changes are interpreted and discussed in everyday public communication.

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Technology, Green Finance, and Monetary Policy Transmission: A New Framework for Sustainable Economic Transformation





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Abstract

Conventional monetary policy transmission frameworks pay limited attention to the growing roles of technological innovation and green finance in shaping financial intermediation and sustainable economic development. This paper addresses this gap by developing the Technology-Driven Green Finance Transmission (TGFT) Framework, a conceptual framework that explains how technology strengthens monetary policy transmission through green financial markets to support sustainable economic transformation. Drawing on monetary economics, institutional economics, information economics, and sustainable finance, the paper integrates these perspectives into a unified analytical framework and applies it to the Nigerian context to illustrate the interactions among digital financial infrastructure, green finance, and monetary policy. The analysis shows that technology improves information efficiency, broadens financial inclusion, enhances capital allocation, and reinforces the responsiveness of financial institutions to monetary policy, while institutional and market constraints may weaken these transmission channels. The paper contributes to the literature by extending conventional monetary transmission analysis to incorporate technology and green finance as complementary transmission mechanisms. It concludes that strengthening digital financial infrastructure, institutional coordination, and green financial market development is essential for improving monetary policy effectiveness and advancing sustainable economic transformation in emerging economies.

Keywords: *Technology; Green Finance; Monetary Policy Transmission; Sustainable Economic Transformation.*

JEL Classification: *E52; O33; G20, G28; Q56.*

1.0 Introduction

Climate change has evolved from an environmental concern into a defining macroeconomic challenge with profound implications for price stability, financial intermediation, economic growth, and long-term development. The increasing frequency and intensity of floods, droughts, heatwaves, and other extreme weather events demonstrate that climate shocks are no longer isolated ecological occurrences but systemic disturbances capable of disrupting production, impairing infrastructure, weakening supply chains, and generating persistent inflationary pressures. Consequently, climate change has become a material consideration for macroeconomic management, compelling governments, financial institutions, and central banks to reconsider the traditional boundaries between environmental sustainability and economic policy (Stern, 2007; Bolton et al., 2020; Network for Greening the Financial System [NGFS], 2023).

These challenges are particularly acute in developing economies, where climate-sensitive sectors account for a substantial share of output, employment, and household livelihoods. Across much of Africa, limited infrastructure resilience, dependence on rain-fed agriculture, and constrained fiscal capacity amplify the transmission of environmental shocks into broader macroeconomic outcomes through lower agricultural productivity, food supply disruptions, higher transportation costs, and sustained inflationary pressures. Climate vulnerability therefore constitutes not only an environmental risk but also an important source of macroeconomic instability capable of constraining investment, productivity, and long-term structural transformation (Intergovernmental Panel on Climate Change [IPCC], 2023; African Development Bank, 2024). Nigeria exemplifies these interrelated challenges. Recurrent flooding, advancing desertification, coastal erosion, and persistent infrastructure deficits have increasingly disrupted agricultural production, business activity, and household welfare, intensifying supply-side inflation and complicating monetary policy in an economy already confronted by exchange-rate volatility and structural bottlenecks. Recognising these risks, the World Bank, the African Development Bank, and the Nigeria Economic Summit Group have identified climate resilience as a strategic

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prerequisite for sustainable economic growth rather than a peripheral environmental objective (World Bank, 2022; African Development Bank, 2024; Nigeria Economic Summit Group, 2023). At the same time, financing climate adaptation, energy transition, and resilient infrastructure requires investment well beyond the capacity of public budgets. Achieving Nigeria's climate commitments, modernizing its energy system, and expanding climate-smart agriculture demand sustained mobilisation of long-term private capital. Green finance has therefore emerged as a critical policy instrument for directing financial resources toward environmentally sustainable and economically productive investments, reinforcing the broader recognition that financial systems actively influence the direction, quality, and resilience of economic development rather than merely intermediating savings and investment (United Nations Environment Programme, 2016; Schoenmaker, 2017).

These developments have also reshaped the role of central banks within modern financial systems. Traditionally focused on price stability and liquidity management, monetary authorities increasingly recognise that climate-related risks affect the conditions under which monetary policy is transmitted. Climate-induced supply disruptions, asset repricing, financial-sector vulnerabilities, and changing investment patterns influence inflation dynamics, credit allocation, and financial stability, prompting central banks to incorporate climate considerations into prudential supervision, financial stability surveillance, stress testing, disclosure standards, and, in some jurisdictions, monetary operations (Bank for International Settlements, 2021; European Central Bank, 2023; NGFS, 2024). The growing digitalisation of financial systems has further broadened the scope of monetary policy transmission by reshaping payment systems, financial intermediation, and the interaction between central banks and financial markets.

Early Nigerian evidence suggested that electronic banking and digital payment systems could strengthen monetary policy implementation by expanding formal financial transactions, improving payment efficiency, and enhancing liquidity management, provided that operational and regulatory risks were effectively managed (Bamidele, 2005). Subsequent studies emphasized that the effectiveness of monetary policy depends fundamentally on the strength of conventional transmission channels—including interest-rate, exchange-rate, credit, and bank-lending channels—and the depth of financial intermediation through which policy actions influence real economic activity (Ajayi, 2007).

Empirical evidence from Nigeria further indicates that structural weaknesses within the financial system continue to constrain these transmission mechanisms. Adenekan and Ahortor (2013) found that broad money remained the dominant channel of monetary transmission, while the credit, interest-rate, and exchange-rate channels were comparatively weak because of limited financial depth and institutional rigidities. More recent studies extend this discussion to the digital era, arguing that innovations such as central bank digital currencies, digital payments, and financial technology are transforming monetary systems by improving payment efficiency, expanding financial inclusion, and strengthening information flows. Their effectiveness, however, depends critically on institutional quality, regulatory capacity, cybersecurity, public confidence, and the broader structure of the financial system (Uwaleke, 2022; Egbuna, 2022; Adedipe, 2022; Nwosa, 2026).

Despite these advances, the literature has largely evolved along parallel rather than integrated paths. Research on green finance has concentrated on sustainable financial instruments and climate-related investment, while studies on digital finance have focused primarily on financial inclusion, payment innovation, and central bank digital currencies. Similarly, the monetary policy literature continues to emphasize conventional transmission channels with comparatively limited attention to how technological innovation and green finance jointly influence the effectiveness of policy transmission. As financial systems become increasingly digital and climate-related risks become more deeply embedded within macroeconomic performance, understanding the interaction among these domains has become an increasingly important policy and research priority. This gap is particularly evident in developing economies such as Nigeria, where climate-financing constraints are compounded by shallow capital markets, high financing costs, fragmented digital infrastructure, and persistent information asymmetries. Although significant progress has been made through sustainable banking principles, sovereign green bonds,

climate-related disclosure standards, and digital financial initiatives, these reforms have generally been pursued as separate policy agendas. Consequently, existing scholarship provides valuable insights into individual policy domains but offers limited guidance on how technology, green finance, and monetary policy can operate as an integrated system to promote sustainable economic transformation (Dikau & Volz, 2021; NGFS, 2024; West African Monetary Institute [WAMI], 2023).

These developments point to an important gap in the literature. While green finance, digital financial innovation, and monetary policy have each received growing scholarly attention, they continue to be examined largely as separate areas of inquiry. Consequently, existing studies provide valuable insights into climate finance, financial technology, and monetary policy transmission individually but offer limited explanation of how these domains interact as mutually reinforcing components of a coherent policy architecture. Yet, as financial systems become increasingly digital and climate risks more deeply embedded in macroeconomic performance, the effectiveness of monetary policy depends not only on conventional policy instruments but also on the technological infrastructure through which financial resources are mobilised, allocated, monitored, and evaluated.

This paper addresses that gap by advancing the Technology-Driven Green Finance Transmission (TGFT) Framework, which conceptualizes technology as the institutional and operational bridge linking monetary policy with green financial intermediation. Rather than treating digital finance, green finance, and monetary policy as distinct policy domains, the framework explains how digital financial infrastructure enhances information efficiency, reduces transaction costs, strengthens transparency, improves resource allocation, and reinforces the transmission of monetary policy to environmentally sustainable investments.

In doing so, the framework extends conventional monetary transmission analysis by incorporating technology and green finance as complementary transmission channels within an integrated financial system. Building on the TGFT Framework, the paper further proposes a Dual-Objective Monetary Policy Framework, which argues that, within an appropriate institutional mandate, monetary policy can pursue macroeconomic and financial stability while facilitating the efficient mobilisation of green finance. The framework does not advocate replacing the traditional objectives of price and financial stability with environmental goals. Rather, it argues that climate-related financial risks, technological innovation, and sustainable investment have become sufficiently intertwined with macroeconomic performance that their systematic consideration can strengthen the effectiveness, resilience, and long-run credibility of monetary policy, particularly in climate-vulnerable developing economies.

Against this background, the paper makes three principal contributions. First, it integrates previously disconnected strands of research on green finance, digital financial innovation, and monetary policy into a unified conceptual framework for analyzing sustainable economic transformation in emerging economies. Second, it develops the Technology-Driven Green Finance Transmission (TGFT) Framework, which extends conventional monetary policy transmission theory by demonstrating how digital financial infrastructure can enhance the mobilisation, allocation, and monitoring of green finance. Third, it proposes a Dual-Objective Monetary Policy Framework, which provides a policy-oriented perspective on how central banks can strengthen climate-related financial intermediation while preserving their primary mandates of price and financial stability. Although the analysis is illustrated using Nigeria, the framework is sufficiently general to inform policy and future empirical research across other climate-vulnerable developing economies.

The remainder of the paper is organised as follows. Section 2 reviews the conceptual and institutional literature on green finance, climate-responsive monetary policy, and digital financial innovation. Section 3 develops the Technology-Driven Green Finance Transmission (TGFT) Framework and the Dual-Objective Monetary Policy Framework that underpin the analysis. Section 4 applies the proposed framework to Nigeria, highlighting the interactions among technology, green finance, and monetary policy together with the institutional constraints and policy implications. Section 5 concludes with the principal findings, contributions, and recommendations for strengthening monetary

policy transmission in support of sustainable economic transformation.

2.0 Green Finance: Concept and Evolution

Green finance has emerged as a central component of contemporary development finance, reflecting growing recognition that financial systems play an important role in addressing climate change and supporting sustainable economic development. Although environmental considerations have long influenced public policy, their integration into mainstream financial decision-making has accelerated over the past two decades in response to mounting evidence of climate risks, expanding international climate commitments, and increasing investor awareness that environmental sustainability has become an important determinant of long-term financial performance (Stern, 2007; United Nations Environment Programme [UNEP], 2016; Bolton et al., 2020). Broadly defined, green finance encompasses financial activities that mobilise and allocate capital toward projects delivering measurable environmental benefits while supporting sustainable economic development. It includes instruments such as green bonds, sustainability-linked loans, climate funds, renewable energy financing, climate-resilient infrastructure, pollution control, biodiversity conservation, and energy-efficiency investments (Organisation for Economic Co-operation and Development [OECD], 2023). Its central objective is to align financial resource allocation with environmental sustainability without compromising long-term economic growth.

Green finance is closely related to, but distinct from, climate finance, sustainable finance, environmental, social and governance (ESG) investing, and transition finance. Climate finance focuses on mitigation and adaptation under international climate agreements, while sustainable finance incorporates environmental, social, and governance considerations across the broader financial system. ESG investing emphasises risk-informed investment decisions, whereas transition finance supports firms and sectors moving progressively toward lower-carbon production. Green finance therefore constitutes an important component of the wider sustainable finance architecture rather than a separate financial system (United Nations Framework Convention on Climate Change [UNFCCC], 2015; International Sustainability Standards Board [ISSB], 2023; OECD, 2023). The evolution of green finance has paralleled major developments in international environmental governance. From the Rio Earth Summit and Agenda 21 to the Paris Agreement, the Sustainable Development Goals, and the Glasgow Climate Pact, international initiatives have progressively expanded the role of financial markets in supporting climate action. These developments have encouraged the adoption of green taxonomies, climate-related disclosure standards, sustainability reporting frameworks, and sustainable investment principles that increasingly shape financial regulation and market practice (UNFCCC, 2015; United Nations, 2015; UNFCCC, 2021).

The growing macro-financial implications of climate change have also broadened the role of financial regulators and central banks. Increasing evidence that climate-related risks affect financial stability, asset valuation, credit risk, and macroeconomic performance has prompted supervisory authorities to incorporate climate considerations into prudential regulation, financial stability assessments, stress testing, and disclosure frameworks. Consequently, environmental sustainability has become increasingly relevant to the resilience and soundness of financial systems rather than remaining solely within the domain of environmental policy (Network for Greening the Financial System [NGFS], 2019; Dikau & Volz, 2021; European Central Bank, 2023). For developing economies, green finance is both an environmental and a developmental imperative. Africa's transition toward climate-resilient growth requires substantial investment in renewable energy, sustainable agriculture, resilient infrastructure, and low-carbon industrialisation, yet public resources remain insufficient to meet these financing needs. Strengthening financial intermediation is therefore essential for mobilising domestic and international private capital to support sustainable investment (African Development Bank, 2024).

Nigeria reflects these broader continental realities. Through initiatives such as the Nigerian Sustainable Banking Principles, sovereign green bonds, sustainable finance guidelines, and climate-policy commitments under the Paris Agreement, the country has progressively established an institutional foundation for green finance. Nevertheless, the effectiveness of these

initiatives depends not only on the availability of financial instruments but also on the institutional and technological mechanisms through which financial resources are mobilised, allocated, and monitored. This observation motivates the discussion of climate-responsive monetary policy and central banking in the next section (Federal Ministry of Environment, 2021; Securities and Exchange Commission Nigeria, 2021; Nigeria Economic Summit Group, 2023).

2.1 Climate Change and Monetary Policy

Conventional monetary policy is predicated on the premise that macroeconomic fluctuations arise primarily from changes in aggregate demand, monetary conditions, productivity, and conventional supply-side shocks. Within this framework, central banks influence inflation and output through policy interest rates, liquidity management, and expectations, while financial markets transmit policy actions through interest-rate, credit, exchange-rate, and asset-price channels. This analytical model has long underpinned monetary policy in both advanced and emerging economies. Climate change has introduced an additional dimension to this framework by generating persistent supply-side disturbances that conventional monetary policy was not designed to address. Floods, droughts, extreme temperatures, and other climate-related events increasingly disrupt agricultural production, industrial activity, transport networks, and energy supply, contributing to higher production costs, supply-chain disruptions, and inflationary pressures (Stern, 2007; Bolton et al., 2020; Intergovernmental Panel on Climate Change [IPCC], 2023). In food-importing and climate-vulnerable economies such as Nigeria, these shocks are particularly significant because they often generate persistent cost-push inflation rather than temporary price adjustments (World Bank, 2022; African Development Bank, 2024).

These developments complicate monetary policy implementation. When inflation originates primarily from climate-induced supply constraints, tighter monetary conditions may exert limited influence on the underlying drivers of inflation while increasing borrowing costs and slowing investment. Consequently, effective monetary policy increasingly requires an understanding of how climate-related risks influence inflation dynamics, financial stability, and the transmission of policy actions rather than relying solely on conventional demand-management instruments (Dikau & Volz, 2021). Earlier Nigerian evidence indicates that inflation dynamics are shaped by both monetary and structural factors, reinforcing the proposition that effective monetary policy transmission depends on the broader institutional environment within which policy operates (Adenekan & Nwanna, 2004). Climate change also has important implications for financial stability. Physical risks arising from extreme weather events may impair collateral values, weaken loan performance, and increase insurance losses, while transition risks associated with environmental regulation, carbon pricing, and technological change may alter asset valuations and expose financial institutions to stranded assets. These risks affect banks' balance sheets, credit allocation, and financial resilience, prompting central banks to incorporate climate-related stress testing, prudential supervision, and sustainability disclosure into their regulatory frameworks (Network for Greening the Financial System [NGFS], 2019; Bank for International Settlements, 2021; European Central Bank, 2023).

Beyond its effects on inflation and financial stability, recent Nigerian evidence suggests that monetary policy transmission itself has evolved alongside structural changes in financial intermediation and digital financial infrastructure. Because monetary policy operates through financial institutions, changes in borrower risk, lending behaviour, and information quality can weaken or distort the transmission of policy signals. Nigerian studies similarly emphasise that the effectiveness of monetary policy depends fundamentally on the efficiency of financial intermediation and the integrity of the financial system (Bamidele, 2005; Ajayi, 2007). Building on these earlier insights, Adenekan and Ahortor (2013) demonstrate that structural weaknesses in financial intermediation constrained several conventional monetary transmission channels in Nigeria. Extending this line of inquiry, Adenekan (2016) finds a bidirectional relationship between broad money velocity and inflation, arguing that the persistent decline in money velocity reflects an evolving monetary regime requiring a reassessment of conventional monetary targeting strategies. More recent studies suggest that digital financial innovation—including central bank digital currencies and digital payment systems—is reshaping these transmission mechanisms by strengthening payment efficiency, information flows, and financial

inclusion, although their effectiveness depends on institutional quality, regulatory capacity, and public confidence (Uwaleke, 2022; Egbuna, 2022; Adedipe, 2022; Nwosa, 2026). These developments have generated an important debate regarding the role of central banks in addressing climate change. One perspective argues that monetary authorities should remain narrowly focused on price and financial stability, leaving climate policy to fiscal authorities and environmental regulators. An alternative view contends that because climate-related risks increasingly influence inflation, financial stability, and monetary-policy transmission, their consideration falls within the legitimate operational responsibilities of central banks. From this perspective, incorporating climate considerations into prudential regulation, financial supervision, collateral frameworks, and selected monetary operations represents an adaptation of conventional central banking to changing macroeconomic realities rather than a departure from its core mandate (Volz, 2017; Bolton et al., 2020; NGFS, 2024).

Recent Nigerian evidence further supports the growing interaction between climate policy and macroeconomic management. Using an environmental Dynamic Stochastic General Equilibrium (E-DSGE) model, Oye and Azuh (2026) show that coordinated climate-responsive fiscal and monetary policies--including green relending facilities--can simultaneously support decarbonisation and macroeconomic stability. Their findings further suggest that the sequencing of climate-oriented policy instruments influences policy effectiveness, reinforcing the importance of integrated macroeconomic design. While their analysis focuses on the macroeconomic effects of alternative climate-policy regimes, the present study complements this evidence by explaining the institutional transmission architecture through which technology, financial intermediation, and monetary policy jointly influence green finance.

For developing economies, the challenge extends beyond managing climate-related financial risks to creating financial systems capable of mobilising long-term investment while preserving macroeconomic stability. Monetary policy therefore operates within an institutional environment in which financial inclusion, technological innovation, payment-system efficiency, and capital-market development increasingly shape the effectiveness of policy transmission. Understanding these interactions provides the foundation for examining how financial technology can strengthen green financial intermediation, which is the focus of the next section.

2.2 Financial Technology and Green Financial Intermediation

The convergence of financial technology and sustainable finance has transformed the manner in which financial systems mobilise, allocate, and monitor investment. Initially developed to improve payment efficiency, expand financial inclusion, and reduce transaction costs, financial technology now supports investment management, regulatory compliance, risk assessment, and environmental reporting. Consequently, technology has evolved from an operational innovation into an institutional capability that enhances the efficiency of financial intermediation (World Bank, 2022; Bank for International Settlements, 2021). This evolution is particularly relevant to green finance. Environmentally sustainable investments are typically characterised by long investment horizons, significant information asymmetries, uncertain cash flows, and complex environmental performance requirements. These characteristics increase transaction costs and investment risk, discouraging private-sector participation, particularly in developing economies where financial markets and environmental reporting systems remain relatively underdeveloped.

Financial technology helps address these constraints by improving the quality, availability, and processing of financial and environmental information. Artificial intelligence, distributed ledger technology, big-data analytics, digital identity systems, and satellite-based monitoring enhance project evaluation, climate-risk assessment, transparency, traceability, and environmental verification. By reducing informational frictions and strengthening market transparency, these technologies improve the efficiency of green financial markets and facilitate more effective capital allocation (Organisation for Economic Co-operation and Development [OECD], 2023; International Monetary Fund, 2023). The implications extend beyond investment decisions to the broader process of financial intermediation. Financial systems perform a sequence of interconnected functions—including identifying investment opportunities, mobilising savings, allocating capital, monitoring performance, and supporting

regulatory oversight—through which savings are transformed into productive investment. Digital financial infrastructure strengthens each of these functions by improving information quality, accelerating transaction processing, reducing coordination costs, and enhancing institutional transparency.

Recent advances in regulatory technology and supervisory technology further reinforce these developments by enabling automated regulatory reporting, strengthening compliance monitoring, improving data quality, and enhancing supervisory surveillance. As sustainability reporting and climate-related financial disclosures become more sophisticated, these technologies expand the capacity of regulators and central banks to assess environmental risks and strengthen financial-system resilience (Bank for International Settlements, 2021; Network for Greening the Financial System [NGFS], 2024). The growing digitalisation of payment systems has also reshaped monetary policy implementation. Electronic payments, mobile financial services, and central bank digital currencies increasingly influence liquidity management, financial inclusion, and the transmission of monetary policy. Nigerian studies similarly show that digital financial innovation can strengthen monetary-policy implementation and payment efficiency, although its macroeconomic effectiveness depends on institutional quality, regulatory capacity, public confidence, and complementary financial-sector reforms (Bamidele, 2005; Uwaleke, 2022; Egbuna, 2022; Adedipe, 2022; Nwosa, 2026).

For developing economies, the strategic importance of financial technology extends beyond operational efficiency. Many climate-related investments remain constrained less by the availability of financial resources than by weaknesses in project preparation, information availability, monitoring systems, and institutional coordination. Technology therefore functions not merely as a collection of digital tools but as an enabling infrastructure that strengthens the mobilisation, allocation, and monitoring of green finance through more efficient financial intermediation. This interpretation distinguishes the present study from much of the existing literature, which has generally examined digital finance, financial technology, and green finance as separate policy domains. The central proposition advanced here is that technology derives its greatest policy significance when embedded within the broader architecture of financial intermediation. Rather than replacing conventional financial institutions or monetary-policy instruments, technology strengthens their capacity to mobilise, allocate, monitor, and evaluate environmentally sustainable investment. This proposition provides the immediate conceptual foundation for the Technology-Driven Green Finance Transmission (TGFT) Framework ((Section 3).

2.3 The Evolution of Evolution of Green Monetary Policy

The relationship between monetary policy and environmental sustainability has evolved significantly over the past two decades. Traditionally, environmental policy was regarded as the responsibility of governments and environmental agencies, while central banks focused on maintaining price stability and, in many jurisdictions, financial stability. This institutional separation reflected the view that environmental objectives lay outside the operational mandate of monetary authorities.
That distinction has gradually narrowed as growing evidence has shown that climate-related risks influence inflation dynamics, financial stability, asset valuations, and long-term macroeconomic performance. Rather than assuming responsibility for environmental policy, central banks increasingly recognise that climate change affects variables already embedded within their statutory mandates. The policy question has therefore shifted from whether climate change is relevant to central banking to how climate-related risks should be incorporated into existing monetary and prudential frameworks (Bolton et al., 2020; Dikau & Volz, 2021).

The initial institutional response focused on financial stability. Climate-related risks were incorporated into prudential supervision through enhanced disclosure requirements, environmental stress testing, and climate-risk assessment. The establishment of the Network for Greening the Financial System (NGFS) in 2017 marked a significant milestone by providing a collaborative platform for developing common approaches to climate-risk analysis, supervisory practices, and scenario modelling (Network for Greening the Financial System [NGFS], 2019). More recently, attention has expanded to the implications of climate change for monetary policy transmission. Persistent supply

disruptions, food-price volatility, energy-market adjustments, and climate-related investment shifts have altered inflation dynamics in ways not fully captured by conventional macroeconomic models. In response, central banks have increasingly incorporated climate scenarios into macroeconomic forecasting, monetary-policy research, and financial-market surveillance while maintaining their primary commitments to price and financial stability (Bank for International Settlements, 2021; European Central Bank, 2023).

The experiences of major central banks illustrate this gradual evolution. The European Central Bank has integrated climate considerations into monetary-policy implementation, collateral frameworks, asset purchases, and risk management. The Bank of England has embedded climate-related risks within prudential supervision and stress testing, while the People's Bank of China has complemented prudential measures with targeted green refinancing facilities and credit-support mechanisms. Although these approaches differ institutionally, they reflect a shared recognition that climate-related risks increasingly influence the functioning of modern financial systems (European Central Bank, 2023; Bank for International Settlements, 2021). For developing economies, however, policy adaptation must reflect domestic institutional realities. Compared with advanced economies, many developing countries face shallower financial markets, more limited long-term finance, and greater climate vulnerability. Consequently, climate-responsive monetary policy is less about replicating advanced-economy practices than about strengthening financial intermediation, institutional coordination, and technological capability in ways that support sustainable development while preserving macroeconomic stability (African Development Bank, 2024; West African Monetary Institute [WAMI], 2023).

The international experience therefore suggests that green monetary policy should be understood as an adaptation of conventional central banking rather than a replacement for it. As climate-related risks become increasingly embedded in inflation, financial stability, and financial intermediation, the effectiveness of monetary policy depends not only on policy instruments but also on the institutional and technological mechanisms through which financial resources are mobilised and allocated. This observation provides the immediate transition to Nigeria's evolving institutional architecture for green finance.

2.4 Nigeria's Green Finance Architecture

Nigeria's institutional framework for green finance has evolved considerably over the past decade, reflecting growing recognition that climate resilience, financial-sector development, and sustainable economic transformation are increasingly interconnected policy objectives. Unlike many advanced economies, however, this framework has developed incrementally through multiple institutions operating under distinct statutory mandates rather than through a single coordinated national strategy. The Central Bank of Nigeria has played a pivotal role in this evolution. The introduction of the Nigerian Sustainable Banking Principles (NSBP) in 2012 marked one of the earliest efforts in Sub-Saharan Africa to integrate environmental and social considerations into banking practice. Subsequent reforms—including financial inclusion initiatives, digital-payment modernisation, and the introduction of the eNaira—have strengthened elements of the financial infrastructure upon which green financial intermediation can develop, even where these initiatives were not designed explicitly as climate policies (Central Bank of Nigeria, 2012; Uwaleke, 2022; Adedipe, 2022).

The institutional architecture has expanded beyond the Central Bank. The Federal Ministry of Environment coordinates national climate policy and international commitments, the Debt Management Office pioneered Africa's first sovereign green bond programme, and the Securities and Exchange Commission has strengthened sustainable-finance governance through disclosure and market-principle reforms. Together with policy advocacy from the Nigeria Economic Summit Group, these initiatives have established important institutional foundations for sustainable finance in Nigeria (Debt Management Office, 2017; Securities and Exchange Commission Nigeria, 2021; Nigeria Economic Summit Group, 2023). Despite this take-off, important structural constraints remain. Green financial markets are relatively shallow, climate-investment data remain fragmented, project preparation capacity is uneven, and coordination among monetary, fiscal, financial, and environmental institutions is still evolving. As in many developing economies, these institutional limitations constrain the efficient mobiliasation

and allocation of long-term climate finance despite increasing policy commitment (African Development Bank, 2024).

A more fundamental limitation is that monetary policy, digital financial innovation, and green finance continue to operate largely as parallel policy domains. While each has advanced individually, comparatively little attention has been given to the institutional mechanisms through which they can reinforce one another. This observation motivates the analytical framework developed in the next section, where technology is examined not as an independent policy objective but as the enabling mechanism through which monetary policy and green finance interact to strengthen sustainable economic transformation.

3.0 Bridging the Analytical Gap: Toward an Integrated Framework

Green finance studies focus primarily on mobilising capital for environmentally sustainable investment, monetary policy research emphasises macroeconomic stabilisation and financial-system resilience, while digital finance scholarship concentrates on payment innovation, financial inclusion, and technological transformation. Comparatively little attention has been devoted to the institutional mechanisms through which these domains interact to influence sustainable economic transformation (Dikau & Volz, 2021; Network for Greening the Financial System [NGFS], 2024). This fragmentation has important analytical consequences. Financial intermediation is fundamentally an institutional process through which information is generated, risks are assessed, capital is allocated, and investment outcomes are monitored. Its effectiveness depends not merely on the availability of finance but on the quality of institutions governing information, incentives, and market coordination (North, 1990). Where information asymmetries persist, capital is misallocated, investment risks are poorly priced, and socially desirable projects—including green investments—remain systematically underfinanced (Stiglitz & Weiss, 1981).

Recent scholarship increasingly recognises that technological innovation is reshaping these institutional relationships. International evidence shows that digital finance enhances information processing, reduces transaction costs, improves market transparency, and strengthens financial intermediation, thereby influencing both financial stability and the effectiveness of monetary policy (Bank for International Settlements [BIS], 2021; Organisation for Economic Co-operation and Development [OECD], 2023). Nigerian studies reach similar conclusions. Uwaleke (2022) argues that digitalisation is redefining the operational role of central banks; Egbuna (2022) demonstrates that digital currencies are reshaping the architecture of modern monetary systems; and Adedipe (2022) shows that digital public infrastructure, exemplified by the eNaira, extends beyond payment efficiency to strengthen monetary oversight and financial-system modernisation.

The emerging literature has also begun to connect digital finance with sustainable development. Ozili (2021/2024) identifies digital finance as an enabling channel for green finance by reducing informational and transactional frictions affecting environmentally sustainable investment. While this represents an important advance, existing studies continue to treat technology primarily as a facilitating instrument rather than as the institutional transmission mechanism through which monetary conditions influence the efficiency of green financial intermediation. This paper advances a broader proposition. Technology is conceptualised not simply as an enabling tool but as the institutional transmission architecture linking monetary policy with green financial intermediation. By improving information quality, strengthening transparency, reducing coordination costs, and enhancing institutional efficiency, technological capability shapes how monetary signals are transmitted through financial markets and ultimately reflected in sustainable investment decisions. Green finance, therefore, is not transmitted directly from policy to investment; it is transmitted through the quality of the technological and institutional infrastructure that supports financial intermediation.

Accordingly, this paper develops the Technology-Driven Green Finance Transmission (TGFT) Framework. The framework neither proposes a new monetary policy mandate nor substitutes monetary policy for fiscal, environmental, or industrial policy. Rather, it provides an integrated analytical structure for explaining how monetary policy, digital financial infrastructure, and green finance reinforce one another in promoting sustainable economic transformation. In doing so, it extends the literature beyond identifying the

components of climate-responsive finance to explaining the transmission process that connects them.

3.1 The Technology-Driven Green Finance Transmission (TGFT) Framework

The analytical gap identified in the preceding section suggests that climate-responsive finance cannot be fully understood by examining monetary policy, digital finance, or green investment in isolation. Rather, it requires an integrated explanation of how these elements interact within a common transmission process. The Technology-Driven Green Finance Transmission (TGFT) Framework is developed to provide that explanation by conceptualising sustainable economic transformation as the outcome of dynamic interactions among monetary policy, technological capability, financial intermediation, and green capital allocation, rather than the product of any single policy instrument. The framework draws upon complementary insights from institutional economics, information economics, and contemporary monetary theory. Institutional economics emphasises that economic performance depends on the quality of institutions governing incentives, coordination, and market exchange (North, 1990).

Information economics demonstrates that efficient financial markets require mechanisms that reduce informational asymmetries affecting credit allocation and investment decisions (Stiglitz & Weiss, 1981). Contemporary central banking literature further recognises that climate-related risks increasingly influence macroeconomic stability, financial resilience, and the effectiveness of monetary-policy transmission (Dikau & Volz, 2021; Network for Greening the Financial System [NGFS], 2024). The TGFT Framework integrates these perspectives by positioning technology as the institutional infrastructure through which monetary policy is transmitted to green financial markets. The TGFT Framework also builds on earlier empirical evidence for Nigeria. Adenekan and Ahortor (2013) showed that weaknesses in financial intermediation constrained the effectiveness of conventional monetary transmission channels. The present study extends that analysis by proposing that technology-enabled financial infrastructure can strengthen those channels through improved information processing, market coordination, and institutional efficiency, thereby enhancing the transmission of monetary policy to green financial intermediation. The framework comprises six interdependent components linked sequentially through continuous institutional feedback.

Policy Layer: The first component is the monetary policy environment, encompassing conventional and emerging policy instruments that influence liquidity conditions, interest rates, credit availability, and financial expectations. Monetary policy establishes the macro-financial conditions within which investment decisions are made, but its influence on sustainable finance depends fundamentally on the efficiency of subsequent transmission stages.

Technology Layer: The second component comprises technology-enabled financial infrastructure, including digital payment systems, financial technology platforms, digital identity systems, regulatory technology (RegTech), supervisory technology (SupTech), digital public infrastructure, and related innovations. Within the TGFT Framework, technology is not treated as an independent modernisation objective but as institutional infrastructure that improves information quality, strengthens transparency, reduces transaction costs, enhances regulatory oversight, and coordinates financial-market activity.

Financial Intermediation Layer: The third component represents the financial intermediation process through which banks, capital markets, development finance institutions, institutional investors, and other intermediaries transform monetary conditions into productive investment opportunities. Technology strengthens these functions by improving information availability, expanding analytical capability, reducing market frictions, and enhancing investment appraisal and risk management.

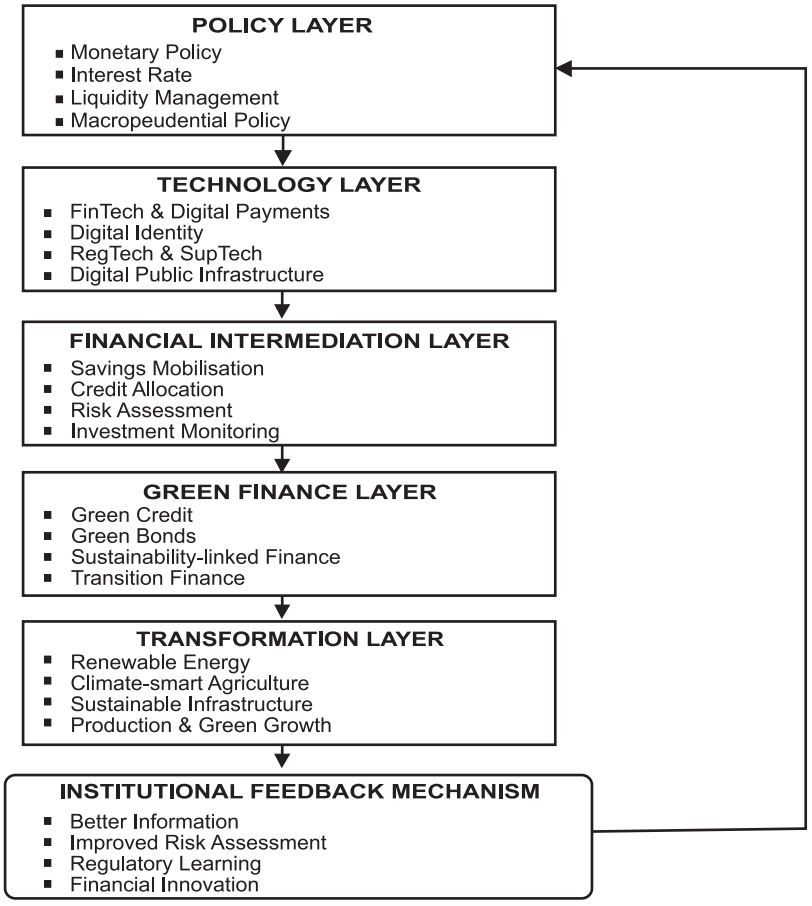
Green Finance Layer: The fourth component is green financial intermediation, whereby financial resources are allocated to environmentally sustainable activities through instruments such as green credit, sustainability-linked lending, green bonds, blended finance, and transition finance. The framework treats green finance as a specialised extension of financial intermediation that incorporates environmental risk, climate resilience, and long-term sustainability into investment decisions rather than as a distinct

financial system. Transformation Layer: The fifth component is green investment and structural transformation. Efficient transmission through the preceding stages supports investment in renewable energy, sustainable agriculture, climate-resilient infrastructure, energy-efficient manufacturing, and other environmentally sustainable sectors. Beyond environmental outcomes, these investments contribute to productivity growth, industrial diversification, technological upgrading, employment creation, and macroeconomic resilience, illustrating that sustainable transformation emerges from efficient financial transmission rather than environmental policy alone.

Institutional Feedback Layer: The final component is a continuous institutional feedback mechanism. Successful green investments generate information that improves risk assessment, strengthens market confidence, encourages financial innovation, and informs subsequent monetary and regulatory decisions. Conversely, weak institutional capacity, fragmented digital infrastructure, policy uncertainty, or inadequate financial supervision interrupt transmission and reduce the effectiveness of both monetary policy and green finance. The TGFT Framework therefore conceptualises transmission as an adaptive institutional system rather than a linear sequence of isolated policy actions.

Figure 3.1 presents the TGFT Framework schematically. It illustrates the sequential interaction among monetary policy, technology-enabled financial infrastructure, financial intermediation, green financial intermediation, and sustainable economic transformation, together with the continuous feedback mechanisms that reinforce or weaken transmission. Its principal analytical contribution lies in conceptualising technology as the institutional transmission architecture linking monetary policy with green financial intermediation. While previous studies have examined these elements individually, the TGFT Framework integrates them into a unified explanation of how climate-responsive monetary policy is transmitted through modern financial systems to support sustainable economic transformation.

Figure 3.1: Technology-Driven Green Finance Transmission (TGFT) Framework



3.2 Transmission Mechanisms of the TGFT Framework

The framework is built to address three systemic friction points that generally affect grecn investments. First, information asymmetry where investors face challenges in verifying whether a project is actually eco-friendly (green washing). Second, regulatory compliance barriers and the burden from reporting and the ever-changing social, environmental and governance crtiteria. Third the encompassing high transaction risk embedded in the complex, long-term risks arising from emerging climate technologies and renewable energy infrastructure. The central analytical proposition of the core channels in the TGFT Framework is that the effectiveness of climate-responsive monetary policy depends not only on the policy instruments employed but also on the efficiency of the institutional transmission architecture through which policy signals are conveyed. Monetary policy influences sustainable investment indirectly through a sequence of interconnected institutional and financial processes rather than through a single transmission channel. Technology strengthens this process by reducing informational frictions, improving market coordination, and increasing the efficiency with which financial resources are mobilised, allocated, and monitored.

The transmission process begins with the monetary policy signal. Conventional instruments—including policy interest rates, reserve requirements, liquidity operations, and macroprudential measures - shape the financial conditions facing households, firms, and financial institutions. Increasingly, central banks also employ climate-related supervisory guidance, disclosure expectations, and financial stability assessments that influence market expectations regarding climate-related financial risks (Dikau & Volz, 2021; Network for Greening the Financial System [NGFS], 2024). Together, these measures establish the macro-financial environment within which investment decisions are made. The second stage is technology-enabled transmission. Digital financial infrastructure - including financial technology, digital payment platforms, artificial intelligence, data analytics, regulatory technology (RegTech), supervisory technology (SupTech), and digital public infrastructure—improves the speed, quality, and transparency of information flows across the financial system. From an information economics perspective, these innovations reduce adverse selection and informational asymmetries that weaken financial intermediation (Stiglitz & Weiss, 1981). From an institutional perspective, they strengthen the capacity of financial institutions to coordinate economic activity efficiently (North, 1990).

Enhanced technological capability reinforces financial intermediation, the third stage of the transmission process. Financial intermediaries are better able to evaluate creditworthiness, assess climate-related investment risks, monitor project performance, and allocate capital more efficiently. Better information improves risk pricing, reduces uncertainty, strengthens investor confidence, and expands the availability of long-term finance for environmentally sustainable investment. Technology therefore complements rather than replaces the core functions of financial intermediation. These improvements facilitate green financial intermediation, whereby financial resources are directed toward investments that generate both economic and environmental value. Green credit, sustainability-linked lending, green bonds, blended finance, transition finance, and related instruments become more effective when supported by reliable digital infrastructure and efficient financial institutions. The availability of green finance therefore depends not only on the supply of capital but also on the institutional quality governing its allocation.

The cumulative outcome of these transmission processes is sustainable economic transformation. Improved access to long-term finance supports investment in renewable energy, climate-smart agriculture, sustainable infrastructure, energy-efficient manufacturing, and other environmentally sustainable sectors. Beyond environmental gains, these investments contribute to productivity growth, industrial diversification, employment creation, technological upgrading, financial resilience, and long-run macroeconomic stability. The TGFT Framework therefore positions green finance as a catalyst for structural transformation rather than as an isolated environmental policy instrument.
Unlike conventional monetary transmission models, the TGFT Framework incorporates continuous institutional feedback. Successful green investments generate new information regarding project performance, climate-related risks, financial innovation, and market behaviour. This information strengthens supervisory learning, improves regulatory oversight, refines

risk-assessment methodologies, and informs subsequent monetary-policy decisions. Transmission is therefore conceptualised as an adaptive institutional process rather than a linear sequence of isolated policy actions. The framework also recognises that transmission effectiveness depends fundamentally on institutional capacity. Weak digital infrastructure, fragmented financial markets, inadequate regulatory coordination, poor data quality, limited technological adoption, and weak governance can interrupt transmission at multiple stages. Conversely, improvements in institutional quality, digital infrastructure, and regulatory effectiveness reinforce each stage of the transmission process, amplifying the impact of monetary policy on green finance and sustainable economic transformation.

Although developed as a conceptual and policy-analytical framework, the TGFT Framework generates several empirically testable implications. Future research may examine whether improvements in digital financial infrastructure strengthen the transmission of monetary policy towards green credit allocation, whether greater technological capability reduces informational frictions affecting sustainable investment, and whether economies with more advanced digital financial ecosystems exhibit stronger monetary-policy transmission to environmentally sustainable sectors. Comparative studies across emerging economies may further expose the institutional factors that facilitate technology which enhances the effectiveness of climate-responsive monetary policy. These propositions provide a clear agenda for future empirical investigation.

3.2.1 The Ultimate Transmission Target: Green TFP

The ultimate aim of this transmission pipeline is to boost Grren Total facor Productivity . By pushing capital funds through these tech-enabled pipelines, transparent and innovative channels, economies experience a multiple structural shift/effect over a short term horizon. The prevalent areas include: Digital Infrastructure & FinTech; Green Finance Finance Allocation (Bonds, CreditESG Loans); Accelerated Green Tech Innovation & Industrial Upgrading; and Inclusive Greengrowth & Carbon Reductio The effects may come through rapid green innovation (immediate effect) and an industrial structure upgrade (slower acting effect).

3.3 Implications for Climate-Responsive Monetary Policy

The Technology-Driven Green Finance Transmission (TGFT) Framework extends the discussion of green finance beyond the design of financial instruments to the institutional conditions that determine how monetary policy influences sustainable investment. Its principal contribution is not the introduction of new monetary-policy instruments but the rethinking of the transmission process through which existing instruments affect environmentally sustainable investment. The framework therefore suggests that the effectiveness of climate-responsive monetary policy depends as much on the quality of technological and institutional infrastructure as on the monetary stance itself.

This perspective broadens conventional monetary transmission theory. Traditional models emphasise interest rates, credit conditions, exchange rates, and asset prices as the principal channels through which monetary policy affects economic activity. While these channels remain fundamental, the TGFT Framework argues that their effectiveness increasingly depends on the efficiency of the digital and institutional infrastructure through which financial markets process information, allocate capital, and manage climate-related risks. Technology therefore complements rather than replaces conventional transmission channels by strengthening the quality of financial intermediation. The framework also offers a refined perspective on the evolving role of central banks. It does not advocate expanding central-bank mandates to encompass environmental or industrial policy. Rather, it argues that because climate-related risks increasingly affect inflation dynamics, financial stability, and monetary-policy transmission, central banks can strengthen the effectiveness of their existing mandates by supporting financial-system resilience, improving information quality, encouraging regulatory innovation, and fostering financial infrastructures that reduce frictions in sustainable investment. Climate responsiveness, in this context, represents an adaptation of prudent monetary and financial governance rather than a departure from established central banking principles (Dikau & Volz, 2021; Network for Greening the Financial System [NGFS], 2024).

For financial regulators and supervisory authorities, the framework underscores the

strategic importance of digital institutional capacity. Regulatory technology (RegTech), supervisory technology (SupTech), interoperable payment systems, digital identity infrastructure, standardised climate-related disclosures, and high-quality financial data strengthen supervisory effectiveness, reduce informational asymmetries, and improve capital allocation. Investments in these institutional capabilities should therefore be viewed not simply as modernisation initiatives but as integral complements to effective monetary-policy transmission. The implications are particularly significant for developing and emerging economies. Although policy discussions often emphasise inadequate financial resources as the principal constraint on green investment, the TGFT Framework suggests that institutional and technological inefficiencies may be equally important. Weak digital infrastructure, fragmented financial markets, limited climate-related financial information, and inadequate institutional coordination can substantially weaken monetary-policy transmission regardless of the availability of financial resources. Strengthening institutional quality may therefore generate gains comparable to, or greater than, expanding finance alone.

This perspective is especially relevant to Nigeria and many African economies, where digital financial innovation has progressed more rapidly than green financial intermediation. The framework suggests that integrating monetary, technological, regulatory, and financial-sector reforms within a coherent institutional architecture offers greater developmental potential than pursuing these initiatives independently. Technology should therefore be understood not merely as a driver of financial innovation but as the institutional architecture through which climate-responsive finance becomes operational. More broadly, the TGFT Framework contributes to the emerging literature on sustainable central banking by shifting analytical attention from policy instruments to transmission efficiency. Existing scholarship has generated important insights into climate-related financial risk, green finance, and monetary policy. The present framework complements these contributions by providing an integrated explanation of how monetary policy, technological capability, institutional quality, and financial intermediation interact to support sustainable economic transformation. Although the TGFT Framework is conceptual, it also establishes a foundation for future empirical inquiry. The relationships identified in the framework may be examined using cross-country comparisons, country-specific time-series analyses, or panel-data approaches to investigate how digital financial infrastructure, institutional quality, and technological capability influence the transmission of monetary policy to environmentally sustainable investment. The framework therefore provides both a conceptual lens for policy analysis and a platform for subsequent empirical research.

4.0 The Nigerian Context for Technology-Driven Green Finance

Nigeria provides an appropriate setting for applying the Technology-Driven Green Finance Transmission (TGFT) Framework because it exhibits three interrelated characteristics common to many emerging economies: persistent macroeconomic adjustment, rapid digital financial innovation, and increasing exposure to climate-related risks. Recent macroeconomic reforms, financial-sector modernisation, and growing policy attention to sustainable finance have created conditions under which monetary policy, technology, and financial intermediation interact more closely than envisaged in conventional monetary transmission models (International Monetary Fund [IMF], 2025; Central Bank of Nigeria [CBN], 2024). The macroeconomic environment has undergone significant adjustment through exchange-rate reforms, tighter monetary policy, fiscal consolidation, and renewed efforts to strengthen policy credibility. While these reforms have improved macroeconomic resilience, they have also underscored the importance of efficient financial intermediation in supporting inclusive and sustainable economic growth (IMF, 2025).

At the same time, Nigeria has experienced rapid expansion in digital financial services. Electronic payments, mobile banking, financial technology (FinTech), and digital payment infrastructure have transformed financial service delivery, expanded financial inclusion, reduced transaction costs, improved information flows, and strengthened several channels through which monetary policy influences economic activity (CBN, 2024; Bank for International Settlements [BIS], 2021). Nigeria has also strengthened its sustainable finance architecture. The introduction of the Nigerian Sustainable Banking Principles (NSBP) in 2012 established an institutional foundation for integrating

environmental and social considerations into banking operations. This was subsequently reinforced through sovereign green bonds, sustainable finance initiatives, and growing attention to climate-related financial risks by policymakers and financial institutions (Central Bank of Nigeria & Bankers' Committee, 2012; Federal Ministry of Environment, 2017; Network for Greening the Financial System [NGFS], 2024). Taken together, these developments demonstrate that monetary policy, digital financial infrastructure, and sustainable finance are increasingly interconnected rather than operating as separate policy domains.

This interaction reflects the central proposition of the TGFT Framework: monetary policy contributes more effectively to sustainable economic transformation when transmitted through technology-enabled financial systems operating within supportive institutional environments. This proposition is consistent with institutional economics, which emphasises the role of institutions in shaping economic outcomes (North, 1990), and information economics, which highlights how reducing informational asymmetries improves financial-market efficiency (Stiglitz & Weiss, 1981). Nigeria therefore serves not merely as a country case but as an analytical setting for demonstrating how the TGFT Framework operates in practice. The following subsection applies the framework's functional layers to Nigeria's evolving policy landscape, illustrating how the interaction among monetary policy, technology, financial intermediation, and sustainable finance shapes the transmission of green finance within the economy.

4.1 Applying the TGFT Framework: Interactions Across the Functional Layers

The Nigerian experience demonstrates that the effectiveness of green finance depends less on the performance of individual policy instruments than on the interaction among the functional layers of the TGFT Framework. Monetary policy establishes the macro-financial conditions within which financial institutions operate, but its influence on sustainable investment is increasingly mediated by technological infrastructure, financial intermediation, and institutional quality rather than by conventional interest-rate channels alone (Central Bank of Nigeria [CBN], 2024; International Monetary Fund [IMF], 2025). The transmission of monetary policy to green investment should therefore be understood as a multi-layered institutional process rather than a purely monetary phenomenon. The first interaction occurs between the Policy Layer and the Technology Layer. Recent monetary tightening and broader financial-sector reforms have coincided with rapid expansion in digital payment systems, electronic banking, and financial technology services. These developments have improved transaction speed, strengthened transparency, and reduced informational frictions across the financial system. As the Bank for International Settlements (2021) observes, digital financial infrastructure enhances monetary transmission by improving the efficiency of financial intermediation. In Nigeria, these developments have expanded the channels through which monetary policy influences financial behaviour beyond the traditional banking system.

The second interaction links the Technology Layer with the Financial Intermediation Layer. Improvements in digital payments, customer identification systems, and financial-data analytics have strengthened credit assessment, reduced transaction costs, and broadened financial access. Although structural constraints remain, technology has progressively reduced some of the informational asymmetries traditionally associated with credit allocation, consistent with the theoretical insights of Stiglitz and Weiss (1981). The resulting improvement in financial intermediation enhances the capacity of the financial system to mobilise and allocate capital more efficiently. The third interaction connects the Financial Intermediation Layer with the Green Finance Layer. Nigeria's adoption of the Nigerian Sustainable Banking Principles and the development of sovereign green bonds have progressively incorporated environmental risk consideration into financial decision-making.

Although the scale of green finance remains modest, these initiatives demonstrate a gradual transition from conventional lending toward sustainability-oriented financial allocation (Central Bank of Nigeria & Bankers' Committee, 2012; Federal Republic of Nigeria Sustainable Bond Framework, 2025; Network for Greening the Financial System [NGFS], 2024). Within the TGFT Framework, this transition reflects stronger integration between financial intermediation and sustainability objectives rather than a standalone environmental policy initiative. The cumulative interaction among these functional layers

ultimately shapes the Transformation Layer. Sustainable economic transformation does not arise from monetary policy, digital innovation, or green finance independently; rather, it emerges when these components reinforce one another within a supportive institutional environment. Improvements in payment infrastructure, financial inclusion, sustainable banking practices, and climate-related financial policies collectively strengthen the financial system's capacity to support investment in renewable energy, climate-resilient infrastructure, sustainable agriculture, and other environmentally productive sectors.

Although the pace of transformation remains constrained by institutional capacity, regulatory coordination, and market depth, Nigeria illustrates how technology increasingly functions as the institutional transmission architecture through which monetary policy influences sustainable development outcomes. The Nigerian experience therefore provides practical support for the central proposition of the TGFT Framework. The effectiveness of green finance depends not on the independent performance of monetary policy, technology, financial institutions, or sustainability initiatives, but on the extent to which these functional layers operate as an integrated transmission architecture. In this respect, the TGFT Framework extends conventional monetary transmission models by identifying technology as the institutional bridge connecting monetary policy with sustainable economic transformation.

4.2 Institutional Constraints

Despite significant progress in monetary policy reform, digital financial innovation, and sustainable finance, several institutional constraints continue to limit the effectiveness of the Technology-Driven Green Finance Transmission (TGFT) Framework in Nigeria. These constraints do not invalidate the framework; rather, they weaken the efficiency with which monetary policy, technological innovation, and financial intermediation translate into sustainable investment. From an institutional economics perspective, transmission effectiveness ultimately depends on the quality of the formal rules, governance structures, and coordinating institutions within which financial markets operate (North, 1990). The first constraint is institutional coordination. Green finance in Nigeria spans multiple institutions—including the Central Bank of Nigeria, the Federal Ministry of Environment, the Debt Management Office, financial regulators, and deposit money banks—whose mandates are complementary but not always fully integrated. Although the Nigerian Sustainable Banking Principles established an important sustainability framework, effective implementation requires sustained coordination among monetary, financial, fiscal, and environmental authorities (Central Bank of Nigeria & Bankers' Committee, 2012). Similar coordination challenges have been identified internationally as a major obstacle to scaling sustainable finance (Network for Greening the Financial System [NGFS], 2024).

A second constraint is the limited depth of sustainable financial markets. While Nigeria has established a sovereign green bond programme and strengthened its sustainable finance architecture, the domestic market for green financial instruments remains relatively small. Limited product diversity, evolving investor demand, and an insufficient pipeline of bankable green projects constrain the financial system's capacity to channel long-term capital toward environmentally sustainable investment (Federal Republic of Nigeria Sustainable Bond Framework, 2025; International Monetary Fund, 2025). The third constraint concerns information quality and climate-related data. Effective green finance depends on reliable environmental disclosures, credible climate-risk information, and consistent project-performance data. In Nigeria, as in many emerging economies, incomplete disclosures and uneven reporting increase uncertainty in credit allocation and investment decisions. These informational deficiencies reduce the efficiency of financial intermediation, consistent with the theoretical insights of Stiglitz and Weiss (1981), while reinforcing the importance of stronger climate-risk disclosure frameworks advocated by the NGFS (2024).

A related challenge is the alignment of technological innovation with regulatory capacity. Digital financial services have expanded rapidly, but regulatory and supervisory systems must evolve at a comparable pace to preserve financial stability. The Bank for International Settlements (2021) emphasises that digital innovation enhances financial efficiency only when supported by sound governance, effective supervision, cybersecurity, and robust regulatory oversight. Within the TGFT Framework,

technology therefore functions as an enabling transmission architecture rather than a substitute for institutional quality. Taken together, these constraints suggest that strengthening green finance requires more than additional financial resources or technological innovation. The effectiveness of technology-driven monetary transmission depends equally on institutional coherence, regulatory credibility, market development, and information transparency. Improving the institutional environment is therefore a necessary complement to monetary policy in advancing sustainable economic transformation.

4.3 Policy Implications

The analysis suggests that strengthening green finance in Nigeria requires a broader conception of monetary policy transmission than that embodied in conventional macroeconomic frameworks. The TGFT Framework demonstrates that monetary policy can contribute more effectively to sustainable economic transformation when supported by technology-enabled financial intermediation operating within a coherent institutional environment. Consequently, policy priorities should extend beyond monetary instruments to the institutional and technological mechanisms through which policy signals are transmitted to the real economy. First, policymakers should adopt a more integrated approach to monetary, financial, fiscal, and environmental policy. While the Central Bank of Nigeria has advanced sustainable banking through the Nigerian Sustainable Banking Principles, sustained progress requires closer coordination among monetary authorities, financial regulators, environmental institutions, and fiscal agencies. Stronger institutional coordination would reduce policy fragmentation, improve regulatory consistency, and better align financial-sector development with national climate and development objectives (Central Bank of Nigeria & Bankers' Committee, 2012; Network for Greening the Financial System [NGFS], 2024).

Second, continued investment in digital financial infrastructure should be recognised as a strategic component of monetary policy transmission rather than solely as a financial inclusion initiative. Efficient payment systems, digital identity infrastructure, interoperable financial platforms, and responsible financial innovation reduce transaction costs, improve information flows, and strengthen financial intermediation. As the Bank for International Settlements (2021) observes, digital financial infrastructure increasingly underpins the effectiveness of modern central banking by enhancing the speed, transparency, and efficiency of financial markets. Third, expanding the scale and depth of sustainable financial markets should remain a national priority. Although Nigeria has established important institutional foundations through sustainable banking principles and sovereign sustainable financing initiatives, long-term progress depends on a broader ecosystem of financial instruments, greater private-sector participation, credible sustainability standards, and transparent climate-related disclosures. Strengthening these market foundations would improve the financial system's capacity to mobilise long-term capital for renewable energy, climate-resilient infrastructure, sustainable agriculture, and other environmentally productive investments (Federal Republic of Nigeria Sustainable Bond Framework, 2025; International Monetary Fund, 2025).

The implications extend beyond Nigeria. Many emerging and developing economies are simultaneously pursuing macroeconomic stabilisation, digital financial transformation, and climate resilience. The TGFT Framework suggests that these objectives should be approached as mutually reinforcing rather than independent policy agendas. Recognising the complementarities among monetary policy, technological capability, financial intermediation, and institutional quality can strengthen both policy effectiveness and long-term development outcomes. The central implication is therefore not that monetary policy should replace environmental or fiscal policy, but that its developmental impact can be substantially enhanced when embedded within an integrated ecosystem of digital finance, sustainable financial intermediation, and effective institutions. In this respect, the TGFT Framework provides a conceptual foundation for rethinking how central banks and financial systems can support sustainable economic transformation while preserving their primary mandates of monetary and financial stability.

5.0 Conclusion

This paper discussed a new conceptual perspective on the relationship among technology, green finance, and monetary policy

by developing the Technology-Driven Green Finance Transmission (TGFT) Framework. The framework extends conventional monetary transmission theory by positioning technology and institutional quality as integral components of the transmission process through which monetary policy influences environmentally sustainable investment. Rather than treating green finance, digital financial innovation, and monetary policy as separate policy domains, the framework demonstrates how their interaction shapes the effectiveness of financial intermediation and, ultimately, sustainable economic transformation.

A principal contribution of the study is the integration of insights from monetary economics, institutional economics, and information economics into a unified analytical tool called TGFT Framework. This explains that the effectiveness of monetary policy depends not only on policy instruments but also on the institutional architecture through which monetary signals are transmitted. By conceptualising technology as the institutional transmission architecture linking monetary policy with green financial intermediation, the framework offers a broader explanation of how climate-responsive finance operates within modern financial systems. Although developed through the Nigerian experience, its analytical logic is sufficiently general to inform comparative research across other emerging economies facing similar macroeconomic, technological, and environmental challenges (North, 1990; Stiglitz & Weiss, 1981).

The analysis also highlights important policy implications. Strengthening green finance requires more than expanding financial resources or introducing new policy instruments. It depends equally on coherent institutions, effective regulatory coordination, robust digital financial infrastructure, transparent sustainability standards, and deeper financial markets. These complementary elements reinforce monetary-policy transmission and enhance the financial system's capacity to mobilise and allocate long-term capital toward environmentally sustainable investment, consistent with emerging international policy thinking on climate-responsive financial systems (Bank for International Settlements, 2021; Central Bank of Nigeria & Bankers' Committee, 2012; Network for Greening the Financial System, 2024). The TGFT Framework also establishes a clear agenda for future research. A natural next step is its empirical validation through country-specific and comparative studies that operationalise the framework's functional layers using measurable indicators of technological capability, institutional quality, financial intermediation, and sustainable finance. Such analyses would enable researchers to examine how these dimensions interact to shape the transmission of monetary policy to environmentally sustainable investment across different institutional settings. Beyond validating the framework, future research could identify context-specific transmission channels, evaluate the relative importance of individual functional layers, and assess the conditions under which technology most effectively strengthens climate-responsive monetary policy. In this way, the TGFT Framework is intended not only as a conceptual contribution but also as a platform for a sustained programme of empirical and policy-oriented research on the evolving relationship among technology, monetary policy, green finance, and sustainable economic transformation.

Ultimately, the significance of this study extends beyond the Nigerian case. As economies simultaneously confront climate change, digital transformation, and evolving monetary-policy challenges, understanding the institutional mechanisms that connect these policy domains becomes increasingly important. The TGFT Framework offers a new analytical lens through which scholars, policymakers, and central banks can examine the interaction among technology, financial intermediation, and monetary policy in advancing sustainable economic transformation. The TGFT Framework is intended to provide a foundation for continued theoretical refinement, empirical validation, and evidence-based policy dialogue on how technology, financial intermediation, and monetary policy can jointly advance sustainable economic transformation in emerging and developing economies.

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Effect of Forensic Accounting Techniques on Financial Statement Fraud in Microfinance Banks in Nigeria



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Abstract

Financial statement fraud threatens confidence in Nigeria's microfinance banking sector. Anchored on the fraud diamond theory, this study examined the effects of anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment. A cross-sectional survey of 225 professionals across Nigeria's six geopolitical zones yielded 222 usable responses. Regression results showed a significant inverse relationship between the techniques and fraud ($R^2 = .583$; adjusted $R^2 = .575$; $p < .001$). The study concludes that forensic accounting techniques materially constrain fraudulent reporting and recommends their formal integration into microfinance banks' enterprise-risk, audit, and supervisory frameworks.

Keywords: *Financial statement fraud, forensic accounting techniques, fraud theory, sustainability, microfinance banks; fraud diamond; Nigeria*

JEL Classification: *G21, G32, M41, M42*

1.0 Introduction

Financial statement fraud remains one of the most significant threats to corporate accountability, financial reporting quality, and stakeholder confidence across the world. High-profile corporate collapses such as Enron, WorldCom, Parmalat, Barings Bank, Olympus, and Satyam demonstrated how the deliberate manipulation of financial information can weaken investor trust, destroy shareholder value, and undermine the integrity of financial systems. The growing sophistication of fraudulent financial reporting has raised concerns among regulators, investors, auditors, and policymakers regarding the effectiveness of conventional audit procedures in detecting and preventing financial statement manipulation. In the financial services sector, the consequences of financial statement fraud are particularly severe because inaccurate reporting can conceal poor asset quality, liquidity challenges, weak capitalization, and operational inefficiencies. Such distortions impair decision-making by regulators, investors, depositors, and other stakeholders. The persistence of financial reporting irregularities has therefore increased interest in forensic accounting as a specialized mechanism for identifying, investigating, and preventing financial fraud. Unlike traditional auditing, forensic accounting combines accounting, auditing, investigative, and legal skills to uncover fraudulent activities and provide evidence suitable for decision-making, regulatory action, or litigation (Rezaee, 2017).

Nigeria's financial sector has not been immune to the challenges of fraudulent financial reporting. The collapse of some financial institutions, including Fortis Microfinance Bank and Integrated Microfinance Bank, heightened concerns regarding governance deficiencies, risk management failures, and weak internal control systems in the microfinance banking subsector (Ajewole, 2021). Given the strategic role of microfinance banks in promoting financial inclusion, supporting small businesses, and providing financial services to low-income groups, the consequences of fraud within the sector extend beyond individual institutions and may adversely affect public confidence in the financial system. To address the growing incidence of fraud, organizations and regulators increasingly employ forensic accounting techniques such as anonymous communication mechanisms, ratio analysis, inspection and observation, and fraud risk assessment.

Anonymous communication systems facilitate whistleblowing and encourage the reporting of suspicious activities. Ratio analysis helps identify unusual financial patterns that may indicate manipulation. Inspection and observation enable direct verification of records, processes, and assets, while fraud risk assessment assists organizations in identifying vulnerabilities and implementing preventive controls. Collectively, these techniques are expected to enhance fraud detection capabilities and strengthen financial reporting integrity. The objective of the study is to evaluate the effect of forensic accounting techniques on financial statement fraud in Nigerian microfinance banks. Specifically, it examines the effects of anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment. The corresponding research questions ask whether each technique has a statistically significant effect on financial statement fraud. The study tests four null hypotheses stating that each technique has no statistically significant effect on financial statement fraud in Nigerian microfinance banks. Existing empirical studies have generally reported a positive relationship between forensic accounting practices and fraud prevention.

However, most previous studies have focused on commercial banks, public-sector institutions, manufacturing firms, or specific states and regions within Nigeria. Furthermore, many studies examined forensic accounting as a broad construct without isolating the specific effects of individual techniques on financial statement fraud. Consequently, empirical evidence on the combined influence of anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment on financial statement fraud within Nigeria's microfinance banking sector remains limited. This represents an important gap in the literature, particularly considering the unique operational characteristics and financial inclusion mandate of microfinance banks. This study addresses this gap by examining the effect of forensic accounting techniques on financial statement fraud in microfinance banks in Nigeria.

Specifically, the study evaluates the effects of anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment on financial statement fraud. The study also contributes to the literature by providing evidence drawn from respondents across Nigeria's six geopolitical zones, thereby offering a broader perspective on the role of forensic accounting techniques in enhancing financial reporting integrity within the microfinance banking sector. To achieve these objectives, the study addressed four research questions and tested four corresponding null hypotheses relating to the effects of the selected forensic accounting techniques on financial statement fraud in Nigerian microfinance banks. The findings of the study are expected to provide useful insights for regulators, policymakers, bank management, auditors, forensic accounting practitioners, and other stakeholders seeking effective strategies for preventing and mitigating financial statement fraud in microfinance banks in Nigeria

2.0 Literature and Theoretical Framework

2.1 Forensic Accounting and Forensic Accounting Techniques

Forensic accounting is the systematic application of accounting, auditing and investigative knowledge to matters involving suspected fraud, disputes or legal scrutiny. It entails recognising, recording, extracting, sorting, verifying and documenting financial information so that manipulation can be identified and the resulting evidence can withstand professional or legal examination (Okoye et al., 2020; Taiya et al., 2021). Forensic accounting techniques are the specific tools through which these objectives are pursued (Ewa et al., 2020). Anonymous communication comprises protected channels through which employees, customers and other stakeholders can report suspected wrongdoing without disclosing their identities.

Hotlines, dedicated email addresses, secure digital channels and locked reporting boxes can expose irregularities that formal controls do not readily identify. Their effectiveness depends on confidentiality, non-retaliation, independent investigation and timely closure of reported cases. Ratio analysis evaluates relationships among financial-statement items and trends over time. Horizontal, vertical and inter-firm comparisons can reveal unusual movements in liquidity, profitability, leverage, accruals, expenses or asset quality. Recent Nigerian evidence also indicates that statistical scrutiny of financial reports, including ratio-based models, can help identify the probability of manipulation in financial institutions (Gbadebo et al., 2023). Inspection and observation involve direct

examination of records, assets, processes and conduct. Spot checks, unannounced visits, cash counts, inventory verification, mystery shopping and confirmation of reported transactions can provide evidence that is not visible from periodic reports alone. Fraud risk assessment is a structured process for identifying fraud scenarios, evaluating likelihood and impact, testing controls and assigning responsibility for mitigation and monitoring.

2.2 Financial Statement Fraud

Financial statement fraud is the deliberate misstatement or omission of material information in financial reports to mislead users. It includes fictitious revenue, concealed liabilities, inflated assets, understated expenses, manipulated estimates, inappropriate application of accounting policies and other abuses of creative accounting (Ajewole, 2021; Rezaee, 2017). In microfinance banks, such practices may conceal deteriorating loan quality, capital weakness, liquidity pressure or insider abuse. Empirical evidence from Nigerian financial institutions shows that financial ratios and accrual-related indicators can predict the likelihood of manipulation, reinforcing the need for forensic review alongside conventional audit procedures (Gbadebo et al., 2023).

2.3 Empirical Review

Ewa et al. (2020) found that forensic accounting techniques supported fraud prevention and detection in Nigeria's banking sector. Widhiyanti and Bernawati (2020) emphasised whistleblowing as a mechanism for exposing fraud, while Malle et al. (2022) reported that fraud prevention and detection methods were relevant in public-sector settings. Sawangarreerak and Thanathamathee (2021) demonstrated the usefulness of analytical techniques for identifying fraudulent patterns in financial statements. Nyakarimi et al. (2020) linked internal-control systems with fraud prevention in banking, while COSO (2016) and CIMA (2016) emphasised structured fraud risk management. Ogwiji (2023) further reported that forensic-accounting knowledge, expertise and litigation-support services were relevant to addressing financial crime in Nigeria.

Although these studies support the value of forensic accounting, differences in jurisdiction, sector, technique and design leave a specific gap concerning Nigerian microfinance banks and the combined effect of the four techniques examined here. Anonymous reporting systems are most useful when they are designed as complete case-management arrangements rather than as simple complaint channels. A credible system states what may be reported, protects the reporter's identity, separates intake from investigation, preserves evidence and communicates outcomes to the appropriate governance body. Where employees believe reports will be ignored or retaliation will follow, the existence of a hotline alone may not change behaviour. For microfinance banks, the board audit committee should therefore oversee the channel, receive trend reports and verify that high-risk cases are investigated independently. This governance dimension explains why anonymous communication can reduce both the opportunity to conceal manipulation and the confidence of potential perpetrators that irregularities will remain undisclosed.

Ratio analysis provides a complementary form of surveillance because fraud may leave patterns even where individual entries appear properly authorised. Changes in interest income, loan-loss provisions, operating expenses, related-party balances, liquidity ratios and the relationship between reported growth and cash generation can signal the need for deeper review. The technique does not, by itself, prove fraud. Its value lies in directing attention to unusual relationships and requiring management to produce verifiable explanations. In a microfinance environment, where numerous small-value transactions may make transaction-by-transaction review costly, risk-based analytical procedures can help auditors and supervisors allocate investigative resources more efficiently. Inspection and observation strengthen evidence by testing whether reported records correspond with physical conditions and actual processes.

Documentary inspection can establish whether approvals, confirmations and supporting schedules exist, while physical observation can reveal weaknesses in cash handling, customer identification, loan monitoring and segregation of duties. Surprise visits are particularly important because predictable control routines may be temporarily staged for reviewers. Nevertheless, these procedures should be documented through standard work programmes, exception logs and follow-up reports. Without a clear escalation process, identified anomalies may persist even after they have been observed. Fraud risk assessment integrates the other techniques into

a forward-looking control process. It begins with the identification of possible schemes, the people or processes exposed, potential incentives and opportunities, and the controls intended to prevent or detect the event. Management then evaluates the likelihood and impact of each scenario, identifies residual risk and agrees on additional action where exposure exceeds tolerance. Periodic reassessment is necessary because products, technology, staffing and delivery channels change. For microfinance banks, fraud risk assessment should cover financial reporting, lending, deposits, electronic channels, related-party dealings, procurement and regulatory returns. The resulting register should be reviewed by management and challenged by the board risk and audit committees.

The empirical literature generally supports the proposition that forensic techniques improve fraud detection and prevention, but the evidence is not uniform. Differences in measurement, sector, sample composition and estimation method can produce different coefficient sizes and levels of significance. Some studies examine broad fraud prevention, whereas the present study focuses specifically on financial statement fraud. Others investigate a single technique or a single state, which limits national inference. The present design addresses part of this gap by combining four techniques and drawing professional respondents from all six geopolitical zones, while recognising that survey perceptions should ultimately be complemented with institutional records and longitudinal evidence.

2.4 Theoretical Framework

The study is anchored principally on the fraud diamond theory, which extends the fraud triangle by adding capability to pressure, opportunity and rationalisation. The theory is appropriate because financial statement fraud requires not only motivation and opportunity but also the competence, authority or access needed to manipulate records and conceal the act.

The selected forensic techniques constrain these conditions: protected reporting reduces concealment, analytical review exposes inconsistencies, inspection limits opportunity, and fraud risk assessment anticipates vulnerabilities. The framework therefore predicts an inverse relationship between the use of forensic accounting techniques and financial statement fraud.

2.5 Conceptual Framework

Independent Variable: Forensic Accounting Techniques	Dependent Variable: Financial Statement Fraud
• Anonymous communication • Ratio analysis • Inspection and observation • Fraud risk assessment	• Financial record manipulation • Abuse of creative accounting

Figure 1. Conceptual relationship between the study variables. Source: Authors' conceptualisation.

3.0 Methodology

The study adopted a cross-sectional survey design and a predominantly quantitative approach. The design was suitable because data were collected at one point in time from professionals with direct knowledge of auditing, bank examination and fraud investigation. The geographical scope covered Nigeria's six geopolitical zones, while the institutional scope focused on microfinance banking and professionals whose work gives them relevant exposure to the sector. The target respondents comprised internal auditors, external auditors, bank examiners and forensic or fraud examiners. A structured 35-item questionnaire was administered to 225 respondents selected across the six zones. Of these, 222 correctly completed questionnaires were used, representing a response rate of 98.7 per cent. The sample size was determined using the Yamane formula at a five per cent margin of error.

The national geographical coverage and professional diversity were intended to improve representativeness, although the sample does not constitute a census of all microfinance banks. The questionnaire used a five-point Likert scale ranging from strongly disagree to strongly agree. Seven items measured financial statement fraud through financial record manipulation and abuse

of creative accounting. The remaining items measured anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment. Five certified fraud examiners and five commissioned bank examiners assessed content and construct validity. Feedback was incorporated before pilot testing, and Cronbach's alpha was used to assess internal consistency.

Primary data were collected through the questionnaire. Participation was based on informed consent, and responses were treated confidentially. The data were coded and analysed with descriptive statistics, factor analysis, correlation, analysis of variance and multiple regression. Normality and independence were assessed before estimation. Statistical decisions were made at the five per cent significance level. The unit of analysis was the professional respondent, and the questionnaire was structured around observable practices rather than abstract perceptions alone. Positively worded items were coded from one to five, while any reverse-worded items were to be recoded before aggregation. Composite scores were formed for the dependent variable and each forensic-technique dimension.

The use of multiple items was intended to reduce measurement error and capture the broader operational meaning of each construct. Data screening covered completeness, coding accuracy and the assumptions required for the selected parametric procedures. The sampling strategy sought coverage across professional groups and geopolitical zones. This approach improves diversity of experience but does not eliminate selection bias because the available sampling frame and the numbers drawn from each category were not reported in sufficient detail in the original manuscript. Replication should therefore disclose the population by stratum, allocation rule, respondent selection procedure and achieved response by zone and profession. Such disclosure would make the design fully reproducible and allow readers to judge whether the weighting of respondent groups affects the estimates.

3.1 Model Specification and Variable Measurement

The empirical model was adapted from the study's conceptual framework and estimated as:

$$FSF = \alpha + \beta_1 AC + \beta_2 RA + \beta_3 IO + \beta_4 FRA + \varepsilon$$

where FSF denotes financial statement fraud; AC is anonymous communication; RA is ratio analysis; IO is inspection and observation; FRA is fraud risk assessment; α is the intercept; β_1–β_4 are the coefficients; and ε is the error term. Higher scale scores on the forensic-technique measures represent stronger deployment of the respective techniques. The a priori expectation is β_1, β_2, β_3 and $\beta_4 < 0$ because stronger forensic controls are expected to reduce financial statement fraud.

4.0 Results and Discussion

4.1 Preliminary and Diagnostic Results

The analytical sequence proceeded from data screening and scale assessment to descriptive analysis, construct assessment and hypothesis testing. This order was intended to ensure that the regression results were interpreted only after basic assumptions had been considered. Correlation results were used to establish the direction of association, while analysis of variance assessed the joint explanatory relevance of the predictors. The multiple-regression coefficients then indicated the direction and relative contribution of each technique while the other techniques were held constant. Because the study used cross-sectional survey scores, the coefficients are interpreted as statistical effects within the estimated model rather than definitive proof of temporal causation. The results should therefore guide policy and control design while encouraging further validation with audited institutional data and repeated observations over time.

The 222 valid questionnaires formed the basis of analysis. The reported descriptive results indicated strong agreement with the use of the forensic techniques, while the composite mean for financial statement fraud was comparatively low. Reliability coefficients for the independent-variable scales met the study's stated social-science threshold of .70. The factor analysis reported a Kaiser-Meyer-Olkin value of .393 and a significant Bartlett's test ($\chi^2 = 93.05$, $p < .001$). Because the KMO value is below commonly accepted adequacy thresholds, the factor-analysis findings should be interpreted cautiously. The analysis nonetheless reported two components accounting for 65.51 per cent of total variance. Anonymous communication had the highest communality (.811), followed by inspection and observation (.801), fraud risk assessment (.771) and ratio analysis (.237). The low communality for ratio analysis warrants further instrument refinement in subsequent

studies. The Durbin-Watson statistic of 2.097 indicates no material first-order autocorrelation in the estimated model. The reported ANOVA and regression statistics show that the joint model is statistically significant. These diagnostics support interpretation of the regression while the sampling and measurement limitations are kept in view.

4.2 Regression and Hypothesis Tests

Technique	Reported B	Reported β	Reported t	Decision (p < .001)
Anonymous communication	- .16	- .39	- 8.24	Reject H01
Ratio analysis	- .13	- .25	- .56*	Statistical Significance not established
Inspection and observation	- .30	- .84	- 16.04	Reject H03
Fraud risk assessment	- .25	- .70	- 13.06	Reject H04

Table 1. Summary of reported coefficient results. Ratio analysis recorded a negative coefficient. However the reported test statistics does not support a definitive conclusion on statistically significance.

The model explained 58.3 per cent of the variation in financial statement fraud (R^2 = .583; adjusted R^2 = .575), while 41.7 per cent was attributable to factors outside the model. The reported F-statistic was 31.53 with $p < .001$, confirming the joint significance of the four predictors. The estimated equation was FSF = 5.01 − .836AC − .697RA − .388IO − .251FRA. The negative signs are consistent with the a priori expectation that stronger forensic-accounting practices reduce fraudulent reporting.

Anonymous communication had a negative and statistically significant effect. This implies that credible hotlines, protected whistleblowing arrangements, dedicated reporting channels and timely investigation can reduce concealment and increase the perceived probability of detection. The finding agrees with Ewa et al. (2020), Widhiyanti and Bernawati (2020) and Malle et al. (2022). Ratio analysis also showed an inverse effect on financial statement fraud. Periodic analysis of liquidity, profitability, leverage, accruals and other relationships can expose unexplained trends and inconsistencies that warrant investigation. This result is consistent with Sawangarreerak and Thanathamathee (2021) and with evidence that ratio-based models can identify manipulation risks in Nigerian financial institutions (Gbadebo et al., 2023). Inspection and observation produced the strongest reported standardised effect. Unannounced cash counts, spot checks, document inspection, mystery shopping and direct observation can reduce the opportunity to fabricate transactions or conceal irregularities. Fraud risk assessment was likewise significant, indicating that systematic identification of fraud scenarios, control weaknesses and responsible risk owners can lower the incidence of misstatement.

Collectively, the findings support the fraud diamond theory. Taken together, the forensic accounting techniques are associated with reduction in conditions that enables fraud, especially opportunity and capability. The results also show that forensic accounting should not operate as an occasional investigative response. It is more effective when embedded in governance, audit planning, enterprise risk management and supervisory review. The magnitude of the reported coefficients suggests that the techniques do not contribute equally. Inspection and observation recorded the largest reported standardised coefficient, followed by fraud risk assessment, anonymous communication and ratio analysis.

This ordering should not be interpreted as a reason to adopt only the strongest technique. The techniques serve different control purposes and are likely to be mutually reinforcing. A reporting channel may generate an allegation, ratio analysis may identify the affected accounts, inspection may verify the underlying evidence, and fraud risk assessment may address the

control weakness that permitted the incident. The practical implication is a portfolio approach rather than isolated deployment.

The unexplained proportion of 41.7 per cent also deserves attention. Financial statement fraud may be influenced by governance quality, ethical climate, ownership structure, staff competence, information systems, regulatory enforcement, compensation incentives and macroeconomic pressure. These omitted factors do not weaken the relevance of the four techniques, but they caution against treating forensic accounting as a complete substitute for sound governance and prudential management. Effective prevention requires competent boards, independent assurance functions, reliable systems, enforceable sanctions and a culture that rewards accurate reporting.

4.3 Policy and Managerial Implications

Microfinance-bank boards should treat fraud risk as a standing governance matter. Audit and risk committees should receive periodic reports on whistleblowing cases, anomalous ratios, spot-check findings, overdue investigations and remediation actions. Management should assign clear responsibility, timelines and evidence requirements for closing identified control gaps. Regulators and supervisors can strengthen prudential surveillance by requiring documented fraud-risk assessments and evidence that forensic techniques are incorporated into institutions' internal-control and enterprise-risk frameworks. Examination programmes should test not only the existence of policies but also their operational effectiveness. Internal and external auditors should similarly report material weaknesses in fraud-reporting channels, analytical review and follow-up procedures.

5.0 Summary, Conclusion and Recommendations

5.1 Summary and Conclusion

The study investigated whether anonymous communication, ratio analysis, inspection and observation, and fraud risk assessment affect financial statement fraud in Nigerian microfinance banks. Evidence from 222 valid responses across the six geopolitical zones showed a significant inverse relationship between the combined techniques and financial statement fraud. The model explained 58.3 per cent of the observed variation, and all four null hypotheses were rejected on the basis of the reported results.

The study concludes that forensic accounting techniques can materially strengthen fraud prevention and financial-reporting integrity when they are consistently implemented, independently monitored and linked to corrective action.

5.2 Recommendations

1. Microfinance banks should establish confidential, independently administered reporting channels within six months and submit quarterly statistics on reports received, investigated, substantiated and closed to their board audit committees.
2. Finance, risk and internal-audit units should conduct documented monthly ratio and trend analyses, define escalation thresholds and retain evidence of investigation and resolution of unusual movements.
3. Internal audit should implement a risk-based programme of quarterly unannounced inspections, spot cash counts and transaction verification, with unresolved high-risk findings escalated to the board within 30 days.
4. Each microfinance bank should complete a formal fraud risk assessment at least annually and after any major product, system or organisational change. The assessment should identify fraud scenarios, control owners, residual risk, deadlines and monitoring indicators.
5. Regulators should incorporate the operational effectiveness of these four techniques into supervisory review, while audit firms should explicitly communicate material weaknesses in forensic controls in management letters.
6. Future research should use larger institution-level samples, combine surveys with interviews and documentary evidence, and verify the results with alternative techniques such as Benford's Law, data mining and financial-statement manipulation models.

5.3 Limitations

The study relies mainly on self-reported cross-sectional perceptions and therefore does not establish causality in the same manner as longitudinal or experimental research. The respondents were professionals rather than a census of all microfinance banks. In addition, the low reported KMO statistic and the apparent inconsistency between one reported t-value and p-value require caution. These limitations do not invalidate the central evidence, but they indicate areas for instrument improvement and replication.

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