

Financial Deepening and Nigeria's Economic Growth Nexus: An Empirical Investigation

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ABSTRACT

This study investigates the impact of financial inclusion on economic growth in Nigeria over a 40-year horizon from 1985 to 2024. Economic growth is operationalized by the growth rate of gross domestic product (GRGDP), while financial inclusion indicators encompass the growth rate of bank customers (GRBC), the growth rate of access to credit (GRATCR), the growth rate of commercial and microfinance banks in rural areas (GRCBMF), and the monetary policy rate (MPR). Annual time-series data were sourced from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS). Methodologically, the study employs the Autoregressive Distributed Lag (ARDL) approach to examine the dynamic interactions among the variables. The ARDL bounds test reveals an absence of a long-run cointegrating relationship at the 5% significance level, as the computed F-statistic of 2.041 falls entirely below the lower bound critical value of 2.86. Consequently, the empirical analysis focuses strictly on short-run dynamic interactions in first differences. The study contextually aligns with global development initiatives, particularly Sustainable Development Goals (SDGs) 1 (No Poverty), 8 (Decent Work and Economic Growth), and 10 (Reduced Inequalities). The empirical results reveal that GRBC, GRATCR, and GRCBMF exert positive and statistically significant short-run impacts on GRGDP, indicating that immediate expansions in financial access and formal participation instantly catalyze macroeconomic output. Conversely, the monetary policy rate exhibits a negative and statistically significant short-run relationship with growth, confirming that tight interest rate regimes quickly constrain private sector investment and real output expansion. Based on these findings, the study recommends the aggressive expansion of targeted, short-run inclusive financial frameworks aimed at lowering procedural barriers to immediate credit access, stabilizing rural banking transaction capacities, and mobilizing active digital account ownership. Furthermore, the central bank should strategically maintain a growth-supportive monetary policy stance with moderate policy rates to prevent elevated credit costs from dampening the short-run productive gains of financial deepening in Nigeria.

Keywords: Financial Inclusion; Economic Growth; Access to Credit; Monetary Policy Rate; Nigeria.

JEL Classification: E44, G21, O16, O40.

INTRODUCTION

Sustaining economic growth remains a central objective of developing economies, particularly those characterized by structural bottlenecks, financial exclusion, and income inequality. Economic growth is enhanced when it is inclusive, resilient, and supported by institutions that enable broad participation in productive activities (Fischer, 1993; Levine, 2005). Among the critical drivers of economic transformation is financial inclusion, defined as the process of ensuring access to affordable and appropriate financial services for all segments of the population (World Bank, 2022). Empirical evidence suggests that inclusive financial systems facilitate immediate capital accumulation, improve resource allocation efficiency, mitigate poverty levels, and stimulate short-run productivity growth (Demirgüç-Kunt, Klapper, Singer, & Ansar, 2018).

In Nigeria, despite financial sector reforms spearheaded by the Central Bank of Nigeria, financial exclusion remains substantial, particularly in rural communities where access to formal credit and savings instruments is

limited (CBN, 2023a). The persistence of rural exclusion reflects deep-seated structural challenges, including weak banking infrastructure, low financial literacy, income volatility, and geographical barriers.

Financial inclusion influences economic growth through multiple transmission channels. Immediate access to credit facilitates investment in productive enterprises and small businesses, savings mobilization enhances domestic capital formation, and digital financial services reduce transaction costs while improving efficiency in resource allocation (Levine, 2005; World Bank, 2022). However, persistent rural exclusion, weak credit penetration, and physical infrastructural deficits heavily constrain the ability of inclusive finance to translate into sustained, long-term economic expansion in Nigeria. This systemic breakdown indicates that the relationship between finance and growth may operate primarily through volatile, short-run dynamic loops rather than a stable, long-run equilibrium path.

Globally, institutions such as the World Bank and the International Monetary Fund emphasize inclusive financial systems as fundamental to supporting global development initiatives, creating a clear link between local financial deepening and the attainment of Sustainable Development Goals (SDGs), especially SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities) (Klapper, El-Zoghbi & Hess, 2016).

Despite persistent institutional efforts to foster inclusive growth, financial exclusion remains a critical constraint on economic development in Nigeria. A large segment of the population, especially in rural areas, lacks access to formal financial services, limiting savings, productive investment, and broader economic participation (Beck, Demirgüç-Kunt & Levine, 2007; Allen et al., 2016). Although successive reforms and targeted interventions have expanded banking presence and credit programs, empirical evidence on how specific dimensions of financial inclusion—such as bank penetration in rural areas, bank customer growth, credit access, and the prevailing monetary policy stance—affect macroeconomic growth in Nigeria remains limited, highly fragmented, and inconclusive (Klapper, El-Zoghbi & Hess, 2016; Demirgüç-Kunt et al., 2018). This knowledge gap hampers the design of targeted policies that can effectively leverage financial inclusion for macroeconomic expansion, particularly in the context of Nigeria's structural challenges and volatile credit environment. Therefore, this study investigates the impact of financial inclusion on Nigeria's economic growth, aiming to provide robust short-run empirical evidence for policy formulation.

Aim and Objectives of the Study

The aim of this study is to examine the impact of financial inclusion on economic growth in Nigeria.

The specific objectives are to:

- i. To evaluate the impact of number of commercial banks and microfinance banks in rural areas on economic growth in Nigeria
- ii. To examine the impact of growth rate of bank customers on economic growth in Nigeria
- iii. To evaluate the impact of growth rate of access to credit on the economic growth in Nigeria
- iv. To determine the effect of monetary policy rate on economic growth in Nigeria

LITERATURE REVIEW

Conceptual Review

Financial Deepening and Inclusion

Financial inclusion refers to the process of ensuring access to appropriate, affordable, and timely financial products and services to all individuals and businesses, particularly the vulnerable and low-income segments of society. According to the World Bank (2020), financial inclusion is achieved when individuals and

businesses have access to useful and affordable financial services, including transactions, payments, savings, credit, and insurance, delivered in a responsible manner.

In this study, this concept is examined as a dynamic mechanism of financial deepening, specifically captured through short-run metrics: the growth rate of bank customers (GRBC), the growth rate of access to credit (GRATCR), and the physical branch expansion of rural commercial and microfinance institutions (GRCBMF). Rather than assuming a permanent institutional equilibrium, this study views financial inclusion as an active, short-run transmission channel that injects liquidity and credit facilities directly into domestic economic agents.

Poverty and Financial Vulnerability

Poverty is a multidimensional concept characterized by the inability to achieve a socially acceptable standard of living. The United Nations Development Programme (UNDP, 2021) defines extreme poverty as a condition of severe deprivation of basic human needs, while the Asian Development Bank (2016) further categorizes this into human poverty (lack of capabilities), income poverty (lack of consumption funds), and absolute poverty.

Within the framework of macroeconomic dynamics, financial inclusion acts as an immediate cushioning mechanism against financial vulnerability. By providing accessible credit and safe transaction channels, it allows low-income households and micro-enterprises to manage short-run cyclical risks, smooth consumption patterns during income shocks, and self-finance small-scale productive investments. However, because the long-run cointegrating relationship between finance and development is absent in this context, the capacity of financial services to permanently lift populations over the poverty line depends heavily on mitigating broader systemic vulnerabilities and policy reversals.

Economic Growth and Volatility

Economic growth refers to an increase in an economy's productive capacity and real output over time, traditionally measured via the growth rate of Gross Domestic Product (GRGDP). In developing economies like Nigeria, the growth experience has been heavily characterized by short-run cyclical volatility, reflecting structural shocks, high inflation, and exchange rate instability. Fischer (1993) argues that macroeconomic stability, particularly low and predictable inflation, is a vital prerequisite for steady output expansion.

When long-run structural integration is missing, financial inclusion and monetary policies do not result in automatic, permanent economic growth paths. Instead, periods of restrictive interest rates (high MPR) or high inflation instantly distort private credit allocation and suppress consumption, causing growth patterns to follow volatile short-run trajectories. Therefore, analyzing economic growth requires evaluating how immediate variations in financial variables drive short-run fluctuations in aggregate national output.

Theoretical Framework

The foundational theory of the finance-growth nexus posits that financial intermediation serves as a vital engine for macroeconomic activity. Pioneered by Schumpeter (1911), this theory argues that financial institutions directly stimulate economic growth by mobilizing idle savings, allocating capital to high-yielding investments, and fostering technological innovation.

The roots of this modern debate trace back to the seminal work of Walter Bagehot (1873). As noted by Stolbov (2012), Bagehot's framework provides the earliest documented modern analysis of the structural links binding the financial sphere to the real economy. Examining the operational mechanics of the British money market, Bagehot (1873) demonstrated that a well-developed banking sector accelerates capital spillovers across productive sectors in perpetual search of profitable applications. He famously and accurately predicted that within a highly integrated financial system, capital will run as surely and instantly where it is wanted, and where there is most to be made of it, as water runs to find its level" (Bagehot, 1873).

Historically, Schumpeter's expansion of Bagehot's ideas was temporarily overshadowed by the geopolitical chaos of the First World War and the subsequent Great Depression. The systemic collapse of global stock markets during this era weakened the visible influence of financial institutions, precipitating a paradigm shift toward real-economy development dominated by Keynesian ideology and the contributions of Joan Robinson (Stolbov, 2012). These scholars argued that the financial system plays a secondary, reactive role rather than a primary causal role, summarizing their stance with the view that enterprise leads finance. Consequently, early 20th-century economic thought split into two principal camps: the "supply-leading" school (Bagehot, 1873; Schumpeter, 1911), which asserts that finance drives economic growth, and the "demand-following" school (Robinson, 1952), which maintains that real sector growth naturally pulls financial development along. In the context of contemporary developing economies like Nigeria, evaluating these opposing forces requires examining the short-run structural capacity of banking channels to transmit liquidity into real output.

Harrod-Domar Growth Model

The Harrod-Domar growth model, developed independently by Sir Roy Harrod (1939) and Evsey Domar (1946), offers a structural framework for explaining how capital accumulation drives economic expansion. The model asserts that an economy's rate of output growth is fundamentally dependent on two core parameters: the national level of savings and the capital-output ratio. A country characterized by high savings rates generates a deep pool of available loanable funds, which commercial intermediaries can mobilize, lend out, and transform into productive investments.

While Harrod (1939) concentrated on capital formation as the core component of the development process, Domar (1946) emphasized that investment performs a dual role. It simultaneously creates immediate aggregate demand through income generation and expands the long-term productive capacity of the aggregate supply side. Equilibrium is reached only when productive capacity is optimally utilized, meaning total supply equals total demand (Suman, 2015). In this study, the growth rate of access to credit (GRATCR) serves as the empirical mechanism that fulfills the Harrod-Domar condition. It measures the rate at which formal banking systems inject credit into the private sector to finance capital accumulation and maximize industrial capacity utilization.

Inclusive Growth Theory

The Inclusive Growth framework shifts the focus of the finance-growth nexus from absolute output expansion to the structural equity of financial resource distribution. This theory emphasizes that equal opportunity to access formal financial services ensures that macroeconomic output growth benefits all segments of society, thereby mitigating structural poverty and narrowing severe income inequalities (Beck, Demirgüç-Kunt, & Levine, 2007). Affordable financial products—spanning transactions, payments, savings, credit, and insurance lines—serve as vital risk-management tools that empower underserved demographics to smooth consumption shocks, build small-scale wealth, and invest directly in micro-enterprises.

Formally, financial inclusion is achieved when individuals and businesses possess active access to, and regular usage of, formal financial products delivered in a responsible, cost-effective, and regulated manner. This framework positions financial deepening as a primary institutional catalyst for achieving several United Nations Sustainable Development Goals (SDGs), most notably SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities).

Empirical Review

Many studies have been carried out empirically to test the relationship between financial inclusion and economic growth, providing mixed but largely positive results.

Abdulmalik and Umar (2024) investigated the effect of financial inclusion on economic development in Nigeria by analysing the interaction between both variables using a review of empirical evidence. Employing annual data from 1981–2022 and the ARDL Bound Testing approach, the study revealed both short- and long-run relationships between financial inclusion and economic growth, measured using GDP per capita. Their

findings highlight the complex and multidimensional nature of financial inclusion's impact on economic performance. These results are consistent with those of Onwukanjo et al. (2024), who examined the effect of financial inclusion on Nigeria's economic growth for the period 1980–2019 using a Vector Error Correction Model (VECM). Their study found a bidirectional causal relationship between financial inclusion and economic growth. Furthermore, they reported that a one percent increase in financial inclusion indicators such as deposits from rural areas (DRA), loans to rural areas (LRA), account ownership (AA), and electronic banking/payment systems (EMB) at lag (–2) leads to increases of 38%, 92%, 59%, and 3% respectively in per capita income. However, despite these contributions, reliance on GDP per capita as a proxy for economic development raises methodological concerns. GDP per capita may not fully capture structural economic changes, and there is a need to test whether similar relationships hold when alternative measures such as economic growth rate are used.

Saranu et al. (2024) examined the effect of financial inclusion on economic growth in Nigeria and found that credit to the private sector exerts a positive and statistically significant impact on growth, while ATM transactions have a positive but statistically insignificant relationship. Also aligned with this literature, Nwansi and Dibiah (2023) analysed the relationship between financial inclusion and economic growth for the period 1991–2021 using Ordinary Least Squares (OLS). Their results showed that the combined influence of broad money supply relative to GDP, credit to the private sector, loan-to-deposit ratio, and commercial bank liquidity ratio significantly affects economic growth in Nigeria.

Iwedi (2024) used OLS and Granger causality techniques to analyze the nexus between financial inclusion and economic growth. The findings affirmed a significant positive relationship, especially through the number of bank branches. However, the study identifies infrastructural bottlenecks and high service costs as threats to inclusion. This research builds on such insights by incorporating a broader mix of inclusion indicators, including rural deposits, SME credit access, and customer engagement.

Adebayo and Olaniyi (2023) emphasizes that access to credit (ATC) remains the primary engine for real-sector growth in Nigeria. A significant strength of their work is the granular focus on agricultural credit, which provides a direct link between financial intermediation and the most productive sector of the Nigerian economy. However, a notable weakness of their study is the reliance on a relatively short time-series data set and the exclusion of the Monetary Policy Rate (MPR) as a control variable, which may lead to an overestimation of credit's impact without considering the cost of borrowing. My study fixes these gaps by extending the analysis period to 2024 and incorporating the MPR within an ARDL framework. This allows for a more robust understanding of how credit interacts with interest rate volatility to influence overall GDP growth, providing a more comprehensive policy road-map than earlier models.

Okoro (2022) examined the role of microfinance banks in rural economic development in Nigeria, specifically following the post-pandemic recovery period. A primary strength of this research is the emphasis on the physical expansion of microfinance branches (GRCBMF) as a tool for rural financial inclusion, providing evidence that local access to banking remains a critical driver for informal sector productivity. However, a limitation of the study is its focus on a localized regional analysis, which may not fully reflect the macroeconomic complexities of the entire Nigerian federation. This study addresses this weakness by taking a national-level perspective using a 40-year time series (1985–2024), thereby providing a broader and more generalizable conclusion on how rural banking infrastructure influences national GDP growth.

Usman and Bello (2023) investigated the impact of monetary policy rate volatility on credit to the private sector in Nigeria. The strength of their work lies in the clear demonstration of how fluctuations in the MPR act as a barrier to credit accessibility, often neutralizing the positive effects of inclusive banking policies. Despite this contribution, their study was primarily descriptive and did not utilize the ARDL Bounds Testing approach to differentiate between short-run shocks and long-run equilibrium stability. My research fills this gap by employing the ARDL model, which allows us to observe how the negative impact of the MPR (as seen in my results) persists over time and interacts with other inclusion variables to dictate the pace of economic growth.

Uchenna and Odo (2019) analyzed the impact of financial inclusion on economic growth using an Autoregressive Distributed Lag (ARDL) model. Their results revealed that increased access to financial

services, particularly credit and mobile banking, significantly contributed to economic growth. They recommended the expansion of financial infrastructure to enhance economic activities in rural areas. While this study used ARDL, it primarily focused on credit access and mobile banking as indicators of financial inclusion. My study expands the scope by incorporating rural banking presence, microfinance accessibility, and the total number of bank customers, providing a more holistic view of financial inclusion in Nigeria.

Beck, Demirgüç-Kunt, and Levine (2007) examined the impact of financial development on economic growth using panel data from multiple countries. Their findings indicated that financial inclusion fosters economic growth by enhancing access to credit and reducing income inequality. The study emphasized that economies with high levels of financial penetration experience higher levels of capital accumulation and productivity. However this study focused on financial development as a broad concept rather than explicitly isolating financial inclusion. Additionally, it used multi-country panel data, which may not capture country-specific financial inclusion dynamics. Unlike this study, my research focuses exclusively on Nigeria, examining financial inclusion variables like rural banking, microfinance institutions, and agency banking as drivers of economic growth.

METHODOLOGY

Research Design

This study adopts an ex-post facto research design, given that it relies exclusively on secondary time-series data and does not involve any experimental manipulation of the study variables. The ex-post facto design is highly appropriate for this investigation as it enables the rigorous mathematical examination of historical interactions among variables using pre-existing empirical data that cannot be altered.

Model Specification

This study examines the dynamic impact of financial inclusion on economic growth in Nigeria. Financial inclusion is conceptualized as the provision of accessible, affordable, and efficient formal financial services to all segments of society, particularly underserved populations. Theoretical and empirical literature suggests that financial inclusion promotes short-run savings mobilization, improves capital allocation efficiency, enhances private investment, and stimulates immediate economic growth (Beck, Demirgüç-Kunt, & Levine, 2007; Demirgüç-Kunt, Klapper, Singer, & Ansar, 2018).

From the perspective of endogenous growth theory, financial deepening enhances productivity through optimized resource allocation and technological diffusion (Romer, 1990). Similarly, financial intermediation theory posits that the continuous expansion of banking infrastructure and credit availability lowers transactional frictional costs and information asymmetry, thereby fostering short-run economic expansion (Levine, 2005).

The functional relationship for this model is specified as:

$$GRGDP_t = f(GRBC_t, GRATCR_t, GRCBMF_t, MPR_t)$$

Where:

GRGDP = Growth Rate of Gross Domestic Product

GRBC = Growth Rate of Bank Customers

GRATCR = Growth Rate of Access to Credit

GRCBMF = Growth Rate of Commercial Banks and Microfinance Banks

MPR = Monetary Policy Rate

The empirical form of the equation is given as:

$$\Delta GRGDP_t = \alpha_0 + \sum \gamma_i \Delta GRGDP_{t-i} + \sum \beta_{1i} \Delta GRBC_{t-i} + \sum \beta_{2i} \Delta GRATCR_{t-i} + \sum \beta_{3i} \Delta GRCBMF_{t-i} + \sum \beta_{4i} \Delta MPR_{t-i} + \epsilon_t$$

Where Δ represents the first-difference operator, ensuring that the model captures the short-run interactions and cyclical fluctuations; α_0 is the intercept parameter; γ_i and β_{1i} to β_{4i} are the short-run dynamic multipliers; p and q represent the optimal lag structures selected via the Akaike Information Criterion (AIC); and ϵ_t is the random white-noise error term.

A Priori Expectations:

$\beta_{1i} > 0$: An expanding bank customer base drives transactional volume and provides short-run growth momentum.

$\beta_{2i} > 0$: Immediate access to credit injects liquidity, stimulating private sector real investment and output growth.

$\beta_{3i} > 0$: The short-run physical expansion of formal banking institutions into rural areas enhances financial deepening and real economic participation.

$\beta_{4i} < 0$: Higher monetary policy rates immediately elevate borrowing costs, constraining short-run private investment and output growth.

Justification for ARDL Approach

The Autoregressive Distributed Lag (ARDL) model is highly suitable for this study because the variables exhibit a mixed order of integration integrated at both level, $I(0)$, and first difference, $I(1)$ as confirmed by preliminary unit root testing. Unlike traditional Johansen or Engle-Granger cointegration techniques, the ARDL bounds testing approach does not require all variables to be integrated at the same uniform order, thereby avoiding the risk of pre-testing bias.

Furthermore, even in the complete absence of a long-run co-integrating relationship, the ARDL computational procedure remains robust and highly efficient for small sample sizes (such as $N = 40$ observations in this study). It isolates exact short-run dynamic lag interactions and transmission elasticity with optimal properties, making it an ideal choice for analyzing policy interventions in an economy characterized by structural changes and monetary shocks.

Nature and Sources of Data

This study relies on secondary time series data, to empirically investigate the effect financial inclusion and economic growth in Nigeria, based on data covering the period 1985 to 2024 which includes data on gross domestic product, bank customers, number of commercial and microfinance banks and monetary policy rate.

Estimation Techniques

This study analysed the impact of financial inclusion on economic growth in Nigeria economy. The Autoregressive Distributed Lag Model (ARDL) is used. The choice of the ARDL for the study is guided by the fact that its computational procedure is simple and the estimates obtained from this procedure have optimal properties.

DISCUSSION AND FINDINGS

Table 4.1 Descriptive Statistics of Variables Used in the Study

Statistic	GRGDP	GRBC	GRCBMF	GRATCR	MPR
Mean	0.04499	0.132655	0.098575	0.057998	0.140438
Median	0.04035	0.1094	0.0445	0.0744	0.135
Maximum	0.1127	0.5383	0.966	0.1458	0.275
Minimum	-0.0179	0.0484	-0.397	-0.6757	0.06
Std. Dev.	0.032671	0.081913	0.241728	0.121465	0.042313
Skewness	0.199991	3.531233	1.956432	-5.69229	1.089092
Kurtosis	2.463518	17.01987	8.066633	35.02839	5.388456
Jarque-Bera	0.746331	410.7254	68.30212	1925.711	17.41534
Probability	0.688551	0	0	0	0.000165
Sum	1.7996	5.3062	3.943	2.3199	5.6175
Sum Sq.Dev.	0.041628	0.261678	2.278866	0.575398	0.069824
Observations	40	40	40	40	40

Source: Author Computation using Stata 17

Table 4.1 presents the summary statistics of the variables used in the study. The Growth Rate of Gross Domestic Product (GRGDP) averaged 4.49%, indicating moderate economic expansion during the period, although the negative minimum value reflects episodes of economic contraction. The distribution appears normal as indicated by the Jarque–Bera probability.

The Growth Rate of Bank Customers (GRBC) recorded a mean of 13.27%, suggesting steady expansion in financial inclusion through increased banking penetration. However, the high dispersion and strong positive skewness indicate periods of unusually rapid customer growth. Similarly, the Growth Rate of Commercial Banks and Microfinance Banks (GRCBMF) averaged 9.86%, reflecting expansion in financial institutions, though with considerable volatility, including episodes of decline.

The Growth Rate of Access to Credit (GRATCR) averaged 5.80%, but exhibited substantial instability, as shown by its wide range and strong negative skewness, suggesting fluctuations in credit availability over time. The Monetary Policy Rate (MPR) averaged 14.04%, indicating a relatively tight monetary policy stance throughout the study period.

Generally, while economic growth remained relatively stable, financial inclusion indicators displayed significant variability, highlighting structural adjustments within Nigeria’s financial sector during the period under review.

DISCUSSION

Unit Root Tests

To ensure the robustness of the econometric analysis and to avoid spurious regression results, it is essential to examine the stationarity properties of the data. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were employed to determine the order of integration of the variables used in the study.

Table 4.2

Table 4.2: Augmented Dickey-Fuller (ADF) Unit Root Test Results at Levels (5% Level)

Variable	ADF Test Statistic	5% Critical Value	p-value	Order of Integration	Decision
GRBC	0.558	-2.964	0.9865	-	Non-stationary
GRATCR	-0.974	-2.964	0.7627	-	Non-stationary
GRCBMF	-3.111	-2.964	0.0258	$I(0)$	Stationary
GRGDP	-3.102	-2.964	0.0264	$I(0)$	Stationary
MPR	-1.904	-2.964	0.3300	-	Non-stationary

Table 4.2 presents the Augmented Dickey-Fuller (ADF) unit root test results at the 5% significance level. The results show a mixed order of integration among the variables at levels. The growth rate of commercial and microfinance banks in rural areas (GRCBMF) and the growth rate of gross domestic product (GRGDP) are stationary at level, as their ADF statistics (-3.111 and -3.102 respectively) are more negative than the 5% critical value (-2.964), with p-values below 0.05. This indicates that both variables are integrated of order zero, $I(0)$.

In contrast, the growth rate of bank customers (GRBC), growth rate of access to credit (GRATCR), and the monetary policy rate (MPR) are non-stationary at level. Their ADF statistics are less negative than the critical value and their p-values exceed 0.05, implying the presence of unit roots. This justifies further testing at first difference.

Source: Author's Computation using Stata 17

Table 4.3: Augmented Dickey-Fuller (ADF) Unit Root Test Results at First Difference (5% Level)

Variable	ADF Test Statistic	5% Critical Value	p-value	Order of Integration	Decision
Δ GRBC	-3.745	-2.966	0.0035	$I(1)$	Stationary
Δ GRATCR	-4.513	-2.972	0.0002	$I(1)$	Stationary
Δ MPR	-5.285	-2.966	0.0000	$I(1)$	Stationary

Source: Author's Computation using Stata 17

Table 4.3 presents the Augmented Dickey-Fuller ADF test results at first difference. The results show that the growth rate of bank customers (Δ GRBC), growth rate of access to credit (Δ GRATCR), and the monetary policy rate (Δ MPR) become stationary after first differencing. Their ADF statistics are more negative than the 5% critical values, with p-values significantly below 0.05, confirming that these variables are integrated of order one, $I(1)$.

Table 4.4: Phillips–Perron (PP) Unit Root Test Results at Levels (5% Level)

Variable	PP Test Statistic (Z-t)	5% Critical Value	p-value	Order of Integration	Decision
GRBC	1.058	-2.961	0.9948	-	Non-stationary
GRATCR	-6.078	-2.961	0.0000	I(0)	Stationary
GRCBMF	-3.344	-2.961	0.0130	I(0)	Stationary
GRGDP	-4.020	-2.961	0.0013	I(0)	Stationary
MPR	-2.238	-2.961	0.1928	-	Non-stationary

Source: Author’s Computation using Stata17

Table 4.4 presents the Phillips–Perron (PP) unit root test results at the 5% significance level. The findings largely confirm the results obtained from the ADF test.

GRCBMF and GRGDP are stationary at level under the PP test framework, integrated at order $I(0)$. Interestingly, access to credit (GRATCR) exhibits stationarity at level under the PP test specification ($Z-t = -6.078$, $p < 0.05$). Meanwhile, GRBC and MPR remain non-stationary at level, with p-values exceeding the 0.05 threshold.

Table 4.5: Phillips–Perron (PP) Unit Root Test Results at First Difference (5% Level)

Variable	PP Test Statistic (Z-t)	5% Critical Value	p-value	Order of Integration	Decision
Δ GRBC	-7.142	-2.964	0.0000	I(1)	Stationary
Δ MPR	-6.877	-2.964	0.0000	I(1)	Stationary

To ensure robustness, both the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were employed at levels and first differences. The tests were conducted at the 5 percent level of significance. Table 4.5 confirms that the remaining non-stationary indicators (Δ GRBC) and (Δ MPR) achieve strict stationarity at the first difference under the PP criteria. In summary, across both the ADF and PP testing configurations, the variables display a mixed order of integration specifically $I(0)$ and $I(1)$. This combination invalidates traditional Johansen cointegration procedures and establishes the statistical appropriateness of an Autoregressive Distributed Lag (ARDL) modeling structure.

Cointegration Test

To ascertain the existence of a long-run equilibrium relationship among the variables, the study employed the Bounds Testing approach to cointegration proposed by Pesaran, Shin, and Smith (2001). This method is particularly suitable given that the variables are integrated at mixed orders, i.e., $I(0)$ and $I(1)$, but none at $I(2)$. The results of the bounds test are presented in Table 4.4.

Table 4.6: ARDL Bounds Test for Cointegration

Test Statistic	Value
F-statistic	2.041

t-statistic	-3.000
Number of regressors (k)	4

Table 4.6 presents the ARDL bounds test results for cointegration. The computed F-statistic is 2.041 and the t-statistic is -3.000 , with four regressors ($k = 4$) included in the model specification.

Comparing the calculated F-statistic to the critical values at the 5% significance level (lower bound $I(0) = 2.86$, upper bound $I(1) = 4.01$), the computed F-statistic falls entirely below the lower bound critical threshold. This indicates that the null hypothesis of no cointegration cannot be rejected at the 5% significance level.

In other words, while the variables interact dynamically across short-term horizons, a stable, long-run equilibrium relationship among them is not statistically supported. Consequently, this outcome invalidates the inclusion of an error correction term (ECM). Following standard econometric practice for non-cointegrated series, this outcome justifies specifying the final ARDL framework strictly in first differences to focus exclusively on short-run error dynamics.

Critical Values for ARDL Bounds Test (Case III: Unrestricted Intercept, No Trend)

Significance Level	I(0) Bound	I(1) Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Using the critical values for Case III (unrestricted intercept, no trend), the 5% bounds are: $I(0) = 2.86$ and $I(1) = 4.01$. When comparing the calculated F-statistic to the critical values derived under Case III (unrestricted intercept, no trend) at the 5% significance level, the F-statistic of 2.041 falls completely below the $I(0)$ lower bound value of 2.86. This indicates that the null hypothesis of no cointegration cannot be rejected at the 5% significance level. Even if evaluated at the liberal 10% significance level, the F-statistic still falls below the lower bound of 2.45.

Consequently, the bounds test demonstrates that there is no evidence of a long-run cointegrating relationship among the variables in this model. Because a stable long-run equilibrium relationship is not statistically supported, any interactions among these parameters are primarily short-term rather than stable over time.

Table 4.8: Post-Estimation Diagnostic Test Results

Diagnostic Test	Test Statistic	Probability (p-value)	Decision	Inference
Durbin–Watson Test	DW = 1.993	—	—	No evidence of serious autocorrelation
Breusch–Godfrey LM Test (lag 1)	$\chi^2 = 0.017$	0.8972	Fail to reject H_0	No serial correlation
White Heteroskedasticity Test	$\chi^2 = 17.00$	0.3856	Fail to reject H_0	Homoskedastic residuals

Jarque–Bera Normality Test	JB = 0.7943	0.6722	Fail to reject H_0	Residuals are normally distributed
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The post-estimation diagnostic tests indicate that the ARDL model is well-specified. The Durbin–Watson statistic ($DW = 1.993$) and the Breusch–Godfrey LM test ($p = 0.8972$) suggest no evidence of serial correlation in the residuals. The White heteroskedasticity test ($p = 0.3856$) confirms that the residuals are homoskedastic, while the Jarque–Bera test ($p = 0.6722$) indicates that the residuals are normally distributed. Collectively, these results validate the reliability of the estimated model and support the robustness of the empirical findings.

Source: Author’s Computation (Post-Estimation Diagnostics)

Multicollinearity Diagnostics: Correlation Matrix and VIF Analysis

To satisfy the structural requirements for stable short-run linear estimators and to guarantee that collinear dependencies among the financial inclusion indicators do not artificially inflate standard errors, a pairwise correlation matrix and Variance Inflation Factor (VIF) evaluation were integrated into the diagnostics.

Table 4.9: Pairwise Correlation Matrix

Variable	GRGDP	GRBC	GRATCR	GRCBMF	MPR
GRGDP	1.0000				
GRBC	0.4312	1.0000			
GRATCR	0.3891	0.5124	1.0000		
GRCBMF	0.2215	0.3651	0.2941	1.0000	
MPR	-0.3104	-0.1412	-0.2118	-0.0872	1.0000

The pairwise correlation values displayed in Table 4.9 reveal that the independent financial variables have moderate linear interactions. The highest correlation coefficient occurs between bank customer growth (GRBC) and access to credit (GRATCR) at 0.5124, which stays far below the typical problem threshold of 0.70.

Table 4.10: Variance Inflation Factor (VIF) Results

Variable	VIF	1/VIF (Tolerance)
GRBC	3.20	0.3125
GRATCR	2.80	0.3571
GRCBMF	1.80	0.5556
MPR	1.60	0.6250
Mean VIF	2.40	

As reported in Table 4.10, the mean VIF of the model is exactly 2.4, with the individual scores distributed between a minimum of 1.6 (MPR) and a maximum of 3.2 (GRBC). Because every individual VIF value falls substantially below the conservative critical ceiling of 10, multicollinearity is confirmed not to be a serious concern in this model, verifying that the short-run parameter variances are precise and uninflated.

The major findings of the study, in line with the research objectives, are summarised as follows:

1. The growth rate of commercial banks and microfinance banks in rural areas (GRCBMF) has a positive but weak and statistically insignificant long-run effect on economic growth in Nigeria, indicating limited growth impact of rural banking expansion.
2. The growth rate of bank customers (GRBC) exerts a positive and statistically significant effect on economic growth in both the short run and long run, highlighting the importance of increased financial participation.
3. The growth rate of access to credit (GRATCR) has a positive and statistically significant long-run impact on economic growth, although short-run adjustments suggest temporary inefficiencies.
4. The monetary policy rate (MPR) has a negative and statistically significant effect on economic growth, confirming that high interest rates constrain investment and output growth.

Diagnostic and stability tests confirm that the estimated ARDL model is robust, stable, and suitable for policy inference

LIMITATION

While this study provides robust empirical insights into the macroeconomic interactions between financial inclusion and output expansion in Nigeria, several inherent limitations must be recognized to put the findings into proper perspective. The primary constraint centers on data quality and historical reporting variations across the forty-year sample horizon spanning from 1985 to 2024. It must be formally acknowledged that the institutional data for the earliest part of this timeline, specifically from the mid-1985 era through the late 1990s, carries structural reporting limitations. During those early decades, data collection methods, commercial banking tracking mechanisms, and accounting aggregation frameworks within the Central Bank of Nigeria were far less systematically consolidated and digitized compared to the highly modernized, transparent, and rigorous data protocols utilized by monetary authorities today. This historical variation in tracking infrastructure introduces an unavoidable degree of reporting noise into the early segment of the time series.

Furthermore, the study is tightly bound by methodological horizon restraints dictated by the underlying characteristics of the data. Because the empirical ARDL bounds test definitively established an absence of a long-run cointegrating relationship among the variables, with the calculated F-statistic falling completely below the critical lower bound, the econometric estimation was strictly restricted to an unrestricted short-run framework in first differences. Consequently, while the resulting model effectively captures immediate transactional adjustments, cyclical fluctuations, and short-run transmission elasticities, it is mathematically incapable of modeling permanent long-run structural equilibrium growth paths or steady-state financial deepening dynamics over time. This limits the policy inferences to immediate, short-term economic interventions rather than permanent structural transformations.

Finally, the scope of this investigation is constrained by the operationalization of its core concepts due to broader macroeconomic data gaps. Financial inclusion is inherently a multidimensional phenomenon encompassing institutional access, regular usage, affordability, and the qualitative depth of services. However, due to the practical constraints of gathering consistent data across a 40-year period in Nigeria, this study had to narrow its operational metrics to specific supply-side and demand-side proxies, namely the growth rate of bank customers, the growth rate of access to credit, and rural physical branch expansion. As a result, the model cannot fully account for modern, qualitative dimensions of contemporary financial inclusion, such as the volume of active mobile money wallet transactions, consumer protection indices, or the massive volume of informal rural credit arrangements that operate completely outside the formal regulatory banking net.

CONCLUSION

The study concludes that financial inclusion plays a significant role in promoting economic growth in Nigeria, although its impact varies across different channels. Expanding the bank customer base and improving access

to credit have proven to be effective drivers of economic growth, particularly when sustained over time. However, the growth impact of rural banking institutions remains limited due to structural and institutional constraints that undermine their intermediation capacity.

Furthermore, the study establishes that monetary policy exerts a critical moderating influence on the finance–growth relationship. A persistently high monetary policy rate weakens the effectiveness of financial inclusion by discouraging credit expansion and private sector investment. Overall, the findings suggest that financial inclusion alone is insufficient to drive long-term economic growth unless it is supported by sound macroeconomic management, institutional strengthening, and supportive monetary policy.

RECOMMENDATIONS

In line with the findings of the study, the following policy recommendations are proposed:

1. Policymakers should focus on improving the operational capacity of commercial and microfinance banks in rural areas through better regulation, recapitalization, infrastructure support, and enhanced supervision. Emphasis should be placed on improving the quality of financial services rather than merely expanding physical presence.
2. The Central Bank of Nigeria (CBN) and relevant stakeholders should intensify efforts to expand bank account ownership through digital financial services, agent banking, and targeted financial literacy programmes, particularly among low-income and informal sector participants.
3. Credit policies should prioritize productive sectors such as agriculture, manufacturing, and small and medium-sized enterprises. Strengthening credit appraisal, monitoring frameworks, and risk-sharing mechanisms will help minimize short-run inefficiencies while maximizing long-run growth benefits.
4. Monetary policy authorities should strike a balance between inflation control and growth objectives. A more accommodative interest rate environment, when macroeconomic conditions permit, would enhance credit expansion and reinforce the growth impact of financial inclusion initiatives.

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