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Financial Inclusion And Growth Of Small And Medium Enterprises In Nigeria

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ABSTRACT
This study examines how financial inclusion influences the growth of Small and Medium Enterprises (SMEs) in Nigeria, using annual time-series data from 1994 to 2024. It employs an ex-post facto design and the Autoregressive Distributed Lag (ARDL) model to assess both short- and long-run relationships between SME output and key financial inclusion indicators: Rural Bank Deposits (RBD), Loans Disbursed by Rural Branches (LRB), Loans and Advances to SMEs (LADSMSE), Bank Branch Spread (BBS), and Financial Deepening Indicator (FDI). Data were sourced from the Central Bank of Nigeria, World Bank, NDIC and NBS. Findings showed that RBD has a strong, positive, and statistically significant effect on SME output, confirming the importance of mobilizing rural savings. However, LRB and BBS are statistically insignificant, pointing to inefficiencies in rural lending and the limited impact of physical bank expansion without supporting services. Surprisingly, LADSMSE shows a significant negative effect, possibly due to poor loan targeting, misuse of funds, or high default rates. FDI also has a negative effect in the short term and marginal significance in the long term, suggesting that greater financial liquidity does not guarantee SME access to credit. These outcomes challenge assumptions of the Supply-Leading Hypothesis and Financial Intermediation Theory, emphasizing that financial inclusion outcomes depend on institutional strength and SME readiness. The study recommends improving SME credit systems, expanding financial literacy, restructuring rural banking, and aligning financial growth with inclusive development. It offers critical insights for both policy and academic circles in sub-Saharan Africa.
Keywords: Financial, Inclusion, Rural, Deposits, Loans Deepening Indicator and Output

INTRODUCTION
Financial inclusion, the availability and accessibility of financial services to all segments of society is vital for economic development, especially in emerging economies like Nigeria. It enables individuals and businesses, regardless of income or location, to access savings, credit, insurance, and payment services. In Nigeria, SMEs are central to employment and GDP growth but often face barriers accessing

formal financial services, which limits their potential. This study explores the impact of financial inclusion—measured through Rural Bank Deposits (RBD), Loans by Rural Branches (LRB), Loans and Advances to SMEs (LADSMSE), Bank Branch Spread (BBS), and Financial Deepening Indicator (FDI, proxied by MS/GDP) on SME output (SMEO).

While Nigeria has taken steps to expand financial access, particularly in rural areas, significant gaps remain. Initiatives by the Central Bank of Nigeria (CBN), such as mobile banking and microfinance expansion, have made progress, yet many Nigerians remain unbanked (Tinubu, 2025). RBDs are key indicators of rural financial trust and savings mobilization, but growth has been constrained by low literacy, poor infrastructure, and a preference for informal systems (Moniepoint, 2024). Similarly, loans from rural bank branches (LRBs) have shown limited reach due to the sparse presence of branches and unfavorable loan terms (Togun et al., 2023).

Despite being designed to support SMEs, loans and advances (LADSMSEs) are often hampered by banks' risk aversion, collateral demands, and high costs (Paga, 2023). The uneven spread of bank branches (BBS), concentrated in urban areas, further limits rural SMEs' access to services (Ilemona& Olaniyi, 2023). Additionally, while financial deepening (measured by MS/GDP) reflects a more developed financial system, the benefits often bypass SMEs due to credit prioritization for large firms, speculative activities, and weak regulatory frameworks (Ihemebiri et al., 2023).

However, new solutions are emerging. Fintech firms like Moniepoint, which raised $110 million with backing from Google's Africa Investment Fund, are bridging access gaps for small merchants. International partnerships—such as those between CBN, World Bank, IFC, and AfDB—have strengthened microfinance, mobile banking, and gender-focused credit initiatives like AFAWA (AfDB, 2023; IFC, 2023). Programs led by the UNDP and others also build SME financial literacy (UNDP, 2023).

While progress is evident, challenges persist. Infrastructure gaps, regulatory hurdles, and trust issues must be addressed. Continued investment, targeted reforms, and public-private collaboration remain critical to fully unlocking SME potential through financial inclusion in Nigeria**.**

Statement of the Problem

Small and Medium Enterprises (SMEs) are essential to Nigeria's economic growth, yet many face persistent barriers to financial access, limiting their development and sustainability. Financial inclusion—defined as access to affordable financial services—is a key enabler of SME growth but remains uneven across the country. Despite interventions like CBN-led credit programs, SMEs face a ₦9.6 trillion financing gap due to high collateral requirements, limited financial records, and poor governance structures (SME Finance Forum, 2023). Gender disparities also persist, with women entrepreneurs facing significantly lower access to finance (CNBS, 2023). FinTech solutions offer promise, but adoption is constrained by digital literacy gaps (Euromoney, 2023), and regional inequalities remain stark, especially in rural and conflict-affected areas (World Bank, 2023). Furthermore, weak financial literacy continues to hinder effective financial planning and access (ScholarWorks, 2023). This study examines how financial inclusion—measured through Rural Bank Deposits (RBD), Loans by Rural Branches (LRB), Loans and Advances to SMEs (LADSMSE), Bank Branch Spread (BBS), and Financial Deepening Indicator (FDI, proxied by MS/GDP)—impacts SME growth in Nigeria, proxied by Small and Medium Enterprises Output (SMEO), with the aim of informing inclusive financial policy and development strategies.

Objectives of the Study

The primary objective of this study is to examine the impact of financial inclusion on the growth of Small and Medium Enterprises (SMEs) in Nigeria. The specific objectives are:

1. To evaluate the impact between Rural Bank Deposits (RBDs) and Small and Medium Enterprises Output (SMEO) in Nigeria.

2. To assess the impact of Loans of Rural Branches (LRBs) on Small and Medium Enterprises Output (SMEO) in Nigeria.

3. To analyze the impact of Loans and Advances to Small & Medium Scale Enterprises (LADSMSEs) on Small and Medium Enterprises Output (SMEO) in Nigeria.

4. To determine the impact of Bank Branches Spread (BBS) in enhancing Small and Medium Enterprises Output (SMEO) in Nigeria.
5. To investigate the impact of Financial Deepening Indicator (FDI) measured by MS/GDP ratio on Small and Medium Enterprises Output (SMEO) in Nigeria.

Research Hypotheses

H01: RBDs have no significant impact on Small and Medium Enterprises Output (SMEO) in Nigeria.
H02: LRBs have no significant impact on Small and Medium Enterprises Output (SMEO) in Nigeria.
H03: LADSMSEs do not significantly impact Small and Medium Enterprises Output (SMEO) in Nigeria.
H04: BBS has no significant impact on Small and Medium Enterprises Output (SMEO) in Nigeria.
H05: FDI measured by MS/GDP ratio does not significantly impact Small and Medium Enterprises Output (SMEO) in Nigeria.

Conceptual Review

Financial Inclusion

Financial inclusion, ensuring individuals and businesses can access and use affordable financial services—is critical to Nigeria's economic development. It enhances credit availability, savings mobilization, and investment in productive activities, especially for small and medium enterprises (SMEs), which are major contributors to employment and GDP. Key indicators of financial inclusion include rural bank deposits (RBDs), loans from rural bank branches (LRBs), loans and advances to SMEs (LADSMSEs), bank branch spread (BBS), and the financial deepening indicator (FDI), measured by the money supply-to-GDP (MS/GDP) ratio. These variables reflect the extent to which financial services are accessible across different segments of the population, particularly in rural and underserved areas.

Despite policy efforts, challenges such as high collateral requirements, poor financial literacy, low digital infrastructure, and uneven branch distribution continue to hinder effective financial inclusion. Many SMEs remain excluded from formal finance, limiting their ability to expand operations, adopt technology, or improve productivity. While initiatives like fintech innovations and agent banking have begun to address these gaps, access remains uneven. This study explores the relationship between financial inclusion and SME growth in Nigeria, using SMEO as a proxy for enterprise performance. By analyzing the impact of RBDs, LRBs, LADSMSEs, BBS, and FDI, the study provides empirical insights into how inclusive financial systems can support sustainable SME development and offers evidence-based recommendations for improving financial access across regions.

Rural Bank Deposits (RBDs): Rural bank deposits are key to financial inclusion in Nigeria, especially for underserved communities. They mobilize savings, boost banking liquidity, and support credit access for SMEs, which are vital to employment and economic growth. Innovations like mobile and agency banking have improved deposit access, but challenges remain—such as poor infrastructure, low financial literacy, and reliance on informal systems. Strengthening rural deposits through targeted policies, digital finance, and improved trust can enhance SME financing and drive local development. A stronger rural banking system is essential for inclusive economic growth and long-term poverty reduction across Nigeria.

Loans of Rural Branches (LRBs): Rural loans are essential for Nigeria's economic development, enabling farmers and small businesses to invest in productive ventures and boost local economies. However, access remains limited due to collateral demands, financial illiteracy, and infrastructure gaps. Fintech, microfinance, and policy interventions like credit guarantees have improved access, yet challenges such as digital illiteracy and trust issues persist. Expanding rural credit through technology, stronger regulation, and targeted support can enhance SME growth, agricultural productivity, and financial inclusion. A coordinated effort among government, banks, and development partners is key to building a more inclusive and sustainable rural credit system in Nigeria.

Loans and Advances to Small & Medium Scale Enterprises (LADSMSEs): Small and medium enterprises (SMEs) are vital to Nigeria's economy, but limited access to finance hinders their growth. High-interest rates, strict lending conditions, and lack of collateral prevent many from securing loans.

Though microfinance, fintech solutions, and government-backed programs have improved access, challenges like low financial literacy and bureaucratic delays persist. Digital platforms now offer alternative funding sources, while financial literacy initiatives are needed to help SMEs better manage credit. Strengthening credit systems, simplifying loan processes, and enhancing support for small businesses are key to unlocking SME potential, promoting job creation, and driving inclusive economic development across Nigeria.

Bank Branches Spread (BBS): Bank branch spread significantly influences financial inclusion and economic growth by improving access to banking services, reducing transaction costs, and building trust. In Nigeria, uneven branch distribution leaves rural areas underserved, limiting credit access and pushing many to rely on informal systems. While digital and agent banking have expanded reach, physical branches remain essential for trust and complex transactions. Government incentives and fintech innovations help bridge the gap, but challenges like infrastructure deficits and digital illiteracy persist. A balanced approach combining traditional and digital banking is key to enhancing SME growth, financial stability, and inclusive economic development across regions.

Financial Deepening Indicator (FDI) measured by Money Supply to GDP (MS/GDP) Ratio: Financial deepening, measured by indicators like the money supply-to-GDP ratio, reflects a well-developed financial system that boosts credit access, investment, and economic growth. It supports SME financing, improves monetary policy transmission, and promotes financial inclusion through digital and microfinance solutions. However, challenges like low financial literacy, regulatory gaps, and inequality can limit its effectiveness. While financial deepening enhances stability and economic participation, unchecked credit expansion can cause instability. To maximize its benefits, policymakers must balance growth with strong oversight, inclusive policies, and financial education—ensuring that both businesses and underserved populations benefit from a more accessible and resilient financial system.

Growth of Small and Medium Enterprises (SMEO) in Nigeria

SME output is a key measure of small business growth and economic impact, reflecting productivity, innovation, and contribution to Nigeria's GDP. SMEs are crucial for job creation and poverty reduction, but access to finance remains a major obstacle to their expansion. Despite efforts through microfinance banks, credit guarantees, and intervention funds, many SMEs still face high-interest rates, collateral demands, and financial illiteracy. Limited infrastructure and regulatory complexity further hinder performance. Digital finance offers promising solutions through mobile banking and fintech platforms, easing credit access and improving transparency. However, digital adoption is uneven, particularly in rural areas, due to infrastructure gaps and low digital literacy.

Government policies have tried to close these gaps with subsidized loans, credit guarantees, and partnerships for financial education. Financial literacy is especially important for improving credit use and resilience during downturns. Yet, disparities remain, especially for women-owned and rural businesses that face additional access barriers. Inclusive policies, gender-sensitive lending, and targeted rural financial services are needed to close these gaps. Emerging technologies like blockchain and AI offer new ways to assess creditworthiness and streamline SME financing. To ensure sustained SME growth, Nigeria must strengthen its financial ecosystem by integrating digital tools, improving infrastructure, and continuing reforms that make financing more inclusive and efficient. SMEs will only reach their full potential with consistent support, accessible financing, and policy frameworks that match the evolving demands of a competitive economy.

Theoretical Review

Inclusive Growth Theory

Inclusive Growth Theory emphasizes that economic growth must be broad-based and equitable to be sustainable. In Nigeria, this theory underscores the importance of financial inclusion—measured by indicators such as Rural Bank Deposits (RBDs), Loans of Rural Branches (LRBs), Loans and Advances to SMEs (LADSMSEs), Bank Branch Spread (BBS), and the Financial Deepening Indicator (MS/GDP)—in translating national growth into widespread benefits. These proxies reflect how access to finance enables SMEs, which are critical to employment and GDP, to thrive. RBDs and LRBs improve rural liquidity and access to credit, while LADSMSEs directly address SME financing gaps. A well-distributed bank network (BBS) increases service access and trust, and financial deepening signals a mature financial system that can efficiently mobilize resources. Digital finance and mobile banking further expand reach, especially to underserved areas(Ogunyemi & Falola, 2021). Despite challenges such as high-interest rates and limited financial literacy, targeted policies like credit guarantees and financial education programs are helping to close inclusion gaps. Ultimately, Inclusive Growth Theory affirms that when financial services are accessible and inclusive, SMEs grow, inequality declines, and long-term economic development is achieved. Nigeria's progress in this area depends on policy reform, digital innovation, and inclusive financial system design.

Credit Rationing Theory

Credit Rationing Theory, introduced by Stiglitz and Weiss (1981), explains why lenders often restrict credit despite borrower willingness to pay higher interest, primarily due to asymmetric information and default risks. In Nigeria, this theory helps explain the persistent challenges SMEs face in accessing finance, despite financial inclusion indicators such as Rural Bank Deposits (RBDs), Loans of Rural Branches (LRBs), Loans and Advances to SMEs (LADSMSEs), Bank Branch Spread (BBS), and Financial Deepening (MS/GDP). Banks, wary of SME credit risk and limited financial documentation, often ration credit rather than adjust prices. Even with expanded bank networks and improved liquidity, credit constraints persist, particularly in rural areas where access to financial services remains uneven. Although digital finance and alternative credit scoring offer potential solutions, their adoption is inconsistent, leaving many SMEs excluded. Government efforts like credit guarantees and reduced collateral requirements aim to counteract rationing but are hindered by regulatory and infrastructural weaknesses. Moreover, economic uncertainty intensifies lender caution. Ultimately, credit rationing remains a key barrier to SME growth in Nigeria, limiting the effectiveness of financial inclusion initiatives. Overcoming it requires better data, technological adoption, policy reforms, and risk-sharing mechanisms to ensure SMEs can access the capital they need to drive inclusive economic development.

Empirical Review

Recent empirical research has explored how financial inclusion influences the growth of small and medium enterprises (SMEs) in Nigeria by analyzing key indicators such as Rural Bank Deposits (RBDs), Loans issued by Rural Branches (LRBs), Loans and Advances to SMEs (LADSMSEs), the geographical distribution of bank branches (BBS), and the Financial Deepening Indicator (FDI), typically represented by the ratio of Money Supply to GDP (MS/GDP).

Adamu and Suleiman (2025) used a NARDL model with data from 2010 to 2024 to assess the asymmetric effects of financial deepening on SME growth in Nigeria. Their findings revealed that positive financial deepening shocks significantly enhance SME output, while negative shocks reduce it considerably. They recommended implementing stabilization policies to ensure steady access to funding for SMEs.

Bello and Olatunji (2025) applied a panel cointegration approach using data from 2013 to 2024 sourced from NDIC and the CBN to study the impact of bank branch spread on SME growth. They found that BBS positively affects SME output, particularly in non-urban regions. The study advocated for policies that encourage banks to open more branches in underserved areas.

Johnson and Adebayo (2025) employed a Vector Autoregression (VAR) model to examine the long-term effect of financial deepening on SME output using CBN data. They discovered that financial deepening,

as measured by MS/GDP, positively influences SME growth over time. However, challenges in loan accessibility persist, leading them to recommend reforms that improve SME access to credit.

Hassan and Yusuf (2025) used a difference-in-differences method to analyze data from 2015 to 2024 and found that loans provided by rural bank branches significantly improved SME productivity, especially in the agribusiness sector. They concluded that expanding targeted loan schemes would strengthen financial inclusion and SME development.

Adegbite and Oladipo (2024) employed the Generalized Method of Moments (GMM) to assess the effect of rural bank deposits and SME credit on output using panel data from 2010 to 2023. The study found that RBDs and LADSMSEs had a positive influence on SME performance, while financial deepening had mixed outcomes. They recommended increasing rural banking coverage and improving financial literacy.

Okonkwo et al. (2024) analyzed time-series data from 2012 to 2023 using an ARDL model and reported that BBS and LADSMSEs significantly contribute to SME growth, particularly in regions with high financial literacy. The study emphasized the importance of government-backed incentives to promote rural banking expansion.

Eze and Chukwuma (2024) employed Structural Equation Modeling (SEM) to evaluate the impact of RBDs on SME output using data from 2011 to 2023. Their results confirmed a positive contribution of RBDs to SME growth but underscored the need for complementary infrastructural improvements. They recommended more government support for rural financial systems.

Umar and Nwankwo (2024) used Tobit regression and data from the World Bank's Global Findex (2012–2023) to examine financial inclusion proxies and SME growth. They found LADSMSEs and FDI to be strong drivers of SME performance. However, limited access to loans remained a challenge. The study advised the creation of tailored credit policies for SMEs.

Obi and Akinyele (2024) utilized Bayesian estimation on 2015–2024 data to study the impact of rural bank loans on SME growth. They found a positive relationship, but high credit costs hindered full benefits. The authors recommended interest rate reduction policies to make loans more affordable for small businesses.

Ekanem and Bello (2024) conducted a dynamic panel analysis using data from 2011 to 2023, revealing that financial inclusion indicators such as RBDs and BBS significantly enhance SME output. They concluded that further improvements in digital banking adoption could amplify these positive effects and recommended broader use of technology in SME financing.

RESEARCH METHODOLOGY

Research Design

This study uses an ex-post facto design to analyze historical data, enabling the evaluation of how financial inclusion indicators have influenced SME growth in Nigeria over time. It suits economic research relying on secondary data, allowing for causal inference without altering existing variables.

Population of the Study

The study focuses on all SMEs in Nigeria and the financial institutions serving them, especially rural and commercial banks. It draws data from the CBN, World Bank, NBS, and NDIC, which offer reliable information on financial inclusion indicators and SME performance across the country.

Sample and Sampling Technique

This study uses purposive sampling to focus on key financial inclusion indicators influencing SME growth, analyzing aggregated data from 1994 to 2024. The sample includes RBDs, LRBs, LADSMSEs, BBS, FDI, and SMEO, drawn from financial institutions during periods of reforms and inclusion initiatives in Nigeria.

Method of Data Collection

This study uses secondary data from CBN, World Bank, NBS, and NDIC reports covering 1994–2024. The data, structured into a time-series format, supports econometric analysis of financial inclusion trends and SME growth across three decades.

Method of Data Analysis

The study applies the ARDL model using E-Views 9.0 to examine both short- and long-run relationships between financial inclusion indicators and SME output, accommodating variables with mixed integration orders. Diagnostic tests include ADF and PP for unit roots, Bound Test for cointegration, Breusch-Godfrey for

autocorrelation, Breusch-Pagan-Godfrey for heteroscedasticity, Jarque-Bera for normality, and Ramsey RESET for model stability, ensuring robustness of results.

Model Specifications

The ARDL model is specified as follows:

$$SMEO_t=\alpha 0+\sum_{i=1}^{p}\beta_i RBD_{t-i}+\sum_{i=1}^{p}\gamma_i LRB_{t-i}+\sum_{i=1}^{p}\delta_i LADSMSE_{t-i}+\sum_{i=1}^{p}\theta_i BBS_{t-i}+\sum_{i=1}^{p}\lambda_i FDI_{t-i}+\mu_t$$

Where:

$SMEO_t$ = Small and Medium Enterprises Output at time ttt (dependent variable)
RBD_{t-i} = Rural Bank Deposits lagged by iii periods
LRB_{t-i} = Loans of Rural Branches lagged by iii periods
$LADSMSE_{t-i}$ = Loans and Advances to SMEs lagged by iii periods
BBS_{t-i} = Bank Branch Spread lagged by iii periods
FDI_{t-i} = Financial Deepening Indicator lagged by iii periods
$\alpha 0$ = Intercept
$\beta i, \gamma i, \delta i, \theta i, \lambda i$ = Estimated coefficients for respective explanatory variables
μt = Error term capturing stochastic disturbances

RESULTS AND DISCUSSION

Time series data refers to data points collected or recorded at successive time intervals, typically used to observe trends, patterns, and relationships over time. In economic research, time series analysis helps uncover how variables evolve and interact across different periods. This study on *Financial Inclusion and the Growth of Small and Medium Enterprises (SMEs) in Nigeria* relies on time series data from 1994 to 2024 to track changes in key financial inclusion indicators—such as rural bank deposits, SME loans, and branch networks—and their influence on SME output. By examining this 30-year span, the study captures both short-term fluctuations and long-term trends, offering deeper insights into the role of financial access in supporting SME development in Nigeria. Time series analysis is particularly useful here, as it allows for modeling dynamic relationships and understanding the economic impacts of policy shifts and financial inclusion initiatives over time.

Descriptive statistics

Descriptive statistics provide an initial understanding of the dataset by summarizing the central tendency, dispersion, and range of the variables. For this study, it helps to capture the general behavior and variability of financial inclusion indicators and SMEO over the 31-year period.The descriptive statistics are summarized on Table 1 below;

Table 1: Descriptive Statistics

	LOGSMEO	LOGRBD	LOGLRB	LOGLADSMSE	LOGBBS	LOGFDI
Mean	2.867532	2.401764	2.398544	2.600511	2.737423	1.402941
Median	2.921412	2.488997	2.494747	2.677485	2.778151	1.408013
Maximum	3.211099	2.806939	2.782451	2.961519	3.000000	1.552244
Minimum	2.477121	1.698970	1.602060	1.778151	2.301030	1.182972
Std. Dev.	0.258562	0.339467	0.341305	0.318468	0.201063	0.074732
Skewness	-0.352149	-0.751377	-0.963739	-1.084541	-0.574734	-0.623131
Kurtosis	1.712181	2.450527	2.990607	3.358950	2.256231	3.947580
Jarque-Bera	2.782911	3.306912	4.798875	6.243612	2.421189	3.165975
Probability	0.248713	0.191387	0.090769	0.044077	0.298020	0.205361
Sum	88.89350	74.45468	74.35488	80.61583	84.86010	43.49118
Sum Sq. Dev.	2.005630	3.457131	3.494680	3.042659	1.212789	0.167548
Observations	31	31	31	31	31	31

Source: E-VIEW 9.0 Output, 2025.

Table 1 presents descriptive statistics of the log-transformed variables over 31 years. SME output (SMEO) averages 2.87 and is slightly left-skewed. Rural bank deposits (RBD) and rural branch loans (LRB) both show negative skewness and moderate dispersion. Loans to SMEs (LADSMSE) have the most peaked and skewed distribution, indicating clustered values with low outliers. Bank branch spread (BBS) is moderately skewed with stable dispersion. Financial deepening (FDI) has the lowest variability. Only LADSMSE shows significant non-normality based on the Jarque-Bera test, while others conform to normality, confirming their suitability for econometric analysis.

Correlation Matrix

The correlation matrix identifies the strength and direction of linear relationships between the independent variables and SMEO. This insight is useful in gauging potential associations between financial inclusion components and SME performance in Nigeria.The outcome is displayed in Table 2 below:

Table 2: Correlation Matrix for the Independent and Dependent Variables

	LOGSMEO	LOGRBD	LOGLRB	LOGLADSMSE	LOGBBS	LOGFDI
LOGSMEO	1.000000					
LOGRBD	0.973969	1.000000				
LOGLRB	0.953906	0.995392	1.000000			
LOGLADSMSE	0.939374	0.990627	0.997016	1.000000		
LOGBBS	0.982045	0.996071	0.990175	0.984508	1.000000	
LOGFDI	0.080800	0.054998	0.065447	0.046377	0.075316	1.000000

Source: E-VIEW 9.0 Output, 2025.

Table 2 shows strong positive correlations between SME output (SMEO) and key financial inclusion indicators: RBD (0.974), LRB (0.954), LADSMSE (0.939), and BBS (0.982), suggesting that increased financial access supports SME growth. However, the high intercorrelation among RBD, LRB, and LADSMSE (all above 0.99), as well as BBS, indicates potential multicollinearity. In contrast, financial deepening (FDI) shows weak positive correlations with all variables, especially SMEO (0.081), implying a limited direct relationship between FDI and SME performance during the 31-year period.

Multicollinearity Test (Variance Inflation Factor - VIF)

The VIF test is employed to detect the presence of multicollinearity among regressors. High multicollinearity among RBD, LRB, LADSMSE, BBS, and FDI could distort the accuracy of estimated coefficients, hence the need to assess it before model estimation. The outcome is displayed in Table 3 below:

Table 3: Variance Inflation Factors Multicollinearity Test

Variance Inflation Factors			
Date: 05/28/25 Time: 16:35			
Sample: 1994 2024			
Included observations: 30			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
LOGSMEO(-1)	0.005800	14458.42	1.441123
LOGRBD	0.020017	36298.15	3.240512
LOGLRB	0.013090	23721.64	2.682711
LOGLADSMSE	0.021162	44819.13	1.371612
LOGBBS	0.050451	116383.8	4.133112
LOGFDI	0.000745	446.8568	6.249681
C	0.070250	21303.31	NA

Source: E-VIEW 9.0 Output, 2025.

Table 3 presents the VIF results assessing multicollinearity among the predictors. SMEO(-1) has a low VIF of 1.44, indicating minimal concern. RBD (3.24), LOGLRB (2.68), and LADSMSE (1.37) show moderate VIFs, suggesting tolerable interdependence. BBS has a slightly higher VIF of 4.13 but remains within acceptable limits. FDI records the highest VIF at 6.25, indicating potential multicollinearity, though still below the critical threshold of 10. Overall, the VIF values confirm that the independent variables are sufficiently distinct, supporting the reliability of the regression estimates.

Breusch-Godfrey Serial Correlation LM Test

This test checks for serial correlation in the residuals of the estimated model. In the context of this study, it ensures that the relationship between financial inclusion and SME growth is not biased by autocorrelated error terms.The outcome is displayed in Table 4 below:

Table 4 Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.026429	Prob. F(2,21)	0.6383
Obs*R-squared	0.012665	Prob. Chi-Square(2)	0.7182

Source: E-VIEW 9.0 Output, 2025.

Table 4 reports the Breusch-Godfrey Serial Correlation LM Test results, indicating no evidence of autocorrelation. The F-statistic (0.0264, p = 0.6383) and Obs*R-squared (0.0127, p = 0.7182) are both statistically insignificant, meaning the null hypothesis of no serial correlation cannot be rejected. This confirms that the residuals are independently distributed, suggesting the model is free from serial correlation and that the coefficient estimates are likely efficient and reliable.

Heteroskedasticity Test (Breusch-Pagan-Godfrey)

This test examines whether the variance of the residuals remains constant. Detecting and correcting heteroskedasticity is vital to obtain efficient estimates when evaluating the influence of financial inclusion measures on SMEO.The outcome is displayed in Table 5 below:

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.971577	Prob. F(6,23)	0.7117
Obs*R-squared	1.018919	Prob. Chi-Square(6)	0.6169
Scaled explained SS	2.427112	Prob. Chi-Square(6)	0.7831

Source: E-VIEW 9.0 Output, 2025.

Table 5 presents the Breusch-Pagan-Godfrey Heteroskedasticity Test results, showing no evidence of heteroskedasticity. The F-statistic (0.9716, p = 0.7117), Obs*R-squared (1.0189, p = 0.6169), and Scaled explained SS (2.4271, p = 0.7831) are all statistically insignificant. These high p-values mean the null hypothesis of constant variance cannot be rejected. This suggests the error terms have consistent variance across observations, confirming model stability and the reliability of coefficient standard errors for inference.

Ramsey RESET Test

The Ramsey RESET test is used to assess model specification. It verifies whether the functional form of the model is appropriate for capturing the true relationship between financial inclusion proxies and SME growth in Nigeria.The outcome is displayed in Table 6 below:

Table 6: Ramsey RESET Test

Ramsey RESET Test				
Equation: UNTITLED				
Specification: LOGDI LOGDI(-1) LOGFDI LOGFPI ODA LOGDR C				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	
t-statistic	0.062436	22	0.8417	
F-statistic	0.076130	(1, 22)	0.6417	

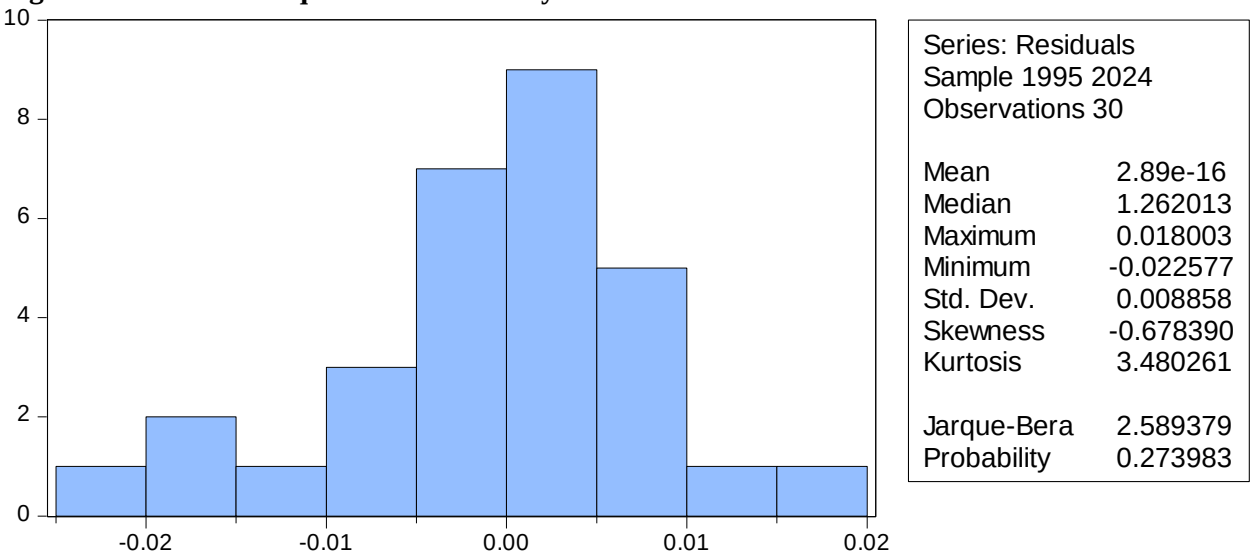
Source: E-VIEW 9.0 Output, 2025.

Table 6 shows the Ramsey RESET Test results, indicating no model specification error. The t-statistic (0.0624, p = 0.8417) and F-statistic (0.0761, p = 0.6417) are both statistically insignificant. These high p-values mean the null hypothesis of correct model specification cannot be rejected. This suggests the model has no omitted variable bias or functional form issues, confirming its structural adequacy and supporting the reliability of the regression results.

Jarque-Bera Probability Test

The Jarque-Bera (JB) test examines whether the residuals of a series are normally distributed. Normality is an important assumption for the validity of ARDL analysis. The outcome is displayed in Figure 1 below:

Figure 1: Jarque-Bera Probability Test



Source: E-VIEW 9.0 Output, 2025.

Figure 1 and the accompanying histogram show that the model's residuals are approximately normally distributed. The residual mean is near zero (2.89e-16), and the standard deviation is low (0.008858), indicating minimal spread. Skewness (-0.678) suggests slight leftward asymmetry, while kurtosis (3.480) is close to the normal value of 3. The Jarque-Bera statistic (2.589) with a p-value of 0.2739 is not significant, so the null hypothesis of normality cannot be rejected. This confirms the model meets the normality assumption, supporting the reliability of its inferential results.

Augmented Dickey-Fuller (ADF) Unit Root Test

ADF is applied to test for stationarity of each time series variable. Since non-stationary data can lead to spurious regression results, it is important to ensure that the variables—RBD, LRB, LADSMSE, BBS, FDI, and SMEO—are either I(0) or I(1) before proceeding to ARDL estimation.The outcome is displayed in Table 7 below:

Table 7: Summary of ADF Test

ADF test at Levels				
Parameter	**ADF test statistic**	**Test critical value @ 5%**	**Prob.***	**Decision**
SMEO	-2.413231	-2.998064	0.1492	Non-stationary
RBD	-5.352384	-2.963972	0.0001	Stationary
LRB	-2.942326	-2.991878	0.0552	Non-stationary
LADSMSE	-10.47096	-2.963972	0.0000	Stationary
BBS	-0.953677	-2.963972	0.0565	Non-stationary
FDI	-7.972813	-2.963972	0.0000	Stationary

ADF test at I[st] Difference				
SMEO	-2.605118	-2.971853	0.0000	Stationary
RBD	-2.281012	-2.976263	0.0036	Stationary
LRB	-2.914071	-2.981038	0.0034	Stationary
LADSMSE	-1.921296	-2.971853	0.0045	Stationary
BBS	-3.699871	-2.981038	0.0024	Stationary
FDI	-5.713284	-2.976263	0.0001	Stationary

Source: E-VIEW 9.0 Output, 2025.

Table 7 shows that SMEO, LRB, and BBS are non-stationary at level, with ADF test statistics less negative than the 5% critical values and p-values above 0.05. In contrast, RBD, LADSMSE, and FDI are stationary at level. After first differencing, all variables become stationary, as their ADF statistics exceed the 5% critical values in magnitude and p-values fall below 0.05. This confirms that the variables are integrated of order one, I(1), making them appropriate for ARDL modeling, which allows a combination of I(0) and I(1) series.

ARDL Bound Test

The ARDL bound testing approach determines whether a long-run relationship exists among the variables, regardless of whether the series are integrated at I(0) or I(1). This is particularly suitable for examining the cointegration between financial inclusion indicators and SMEO over the 31-year study period. The outcome is displayed in Table 8below:

Table 8: ARDL Bounds Test				
Date: 05/15/25 Time: 07:44				
Sample: 1994 2024				
Included observations: 31				
Null Hypothesis: No long-run relationships exist				
Test Statistic	Value	k		
F-statistic	23.13026	5		
Critical Value Bounds				
Significance	I0 Bound	I1 Bound		
10%	2.26	3.35		
5%	2.62	3.79		
2.5%	2.96	4.18		
1%	3.41	4.68		

Source: E-VIEW 9.0 Output, 2025.

Table 8 presents the ARDL Bounds Test results, where the F-statistic of 23.13026 exceeds all upper bound critical values at the 10%, 5%, 2.5%, and 1% levels. This provides strong evidence to reject the null hypothesis of no long-run relationship. It confirms a stable long-run equilibrium relationship between SME output (SMEO) and its predictors—RBD, LRB, LADSMSE, BBS, and FDI—during the 1994–2024 period.

ARDL Cointegration and Long Run Form

Once cointegration is confirmed, the ARDL long-run form analysis estimates both short-run dynamics and long-run coefficients. This provides valuable insights into how financial inclusion indicators have influenced SME growth in Nigeria over time. The outcome is displayed in Table 9 below:

Table 9: ARDL Cointegration and Long Run Form

ARDL Cointegrating And Long Run Form				
Dependent Variable: LOGSMEO				
Selected Model: ARDL(1, 0, 0, 0, 0, 0)				
Date: 05/28/25 Time: 16:46				
Sample: 1994 2024				
Included observations: 30				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGRBD)	0.680221	0.141482	4.807836	0.0001
D(LOGLRB)	0.007939	0.114414	0.069388	0.9453
D(LOGLADSMSE)	-0.354953	0.145471	-2.440025	0.0228
D(LOGBBS)	-0.320630	0.224613	-1.427477	0.1669
D(LOGFDI)	-0.068199	0.027298	-2.498329	0.0201
CointEq(-1)	-0.237191	0.076160	-3.114389	0.0049
Cointeq = LOGSMEO - (2.8678*LOGRBD + 0.0335*LOGLRB -1.4965 *LOGLADSMSE -1.3518*LOGBBS -0.2875*LOGFDI + 3.9795)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGRBD	2.867818	1.013756	2.828904	0.0095
LOGLRB	0.033471	0.483766	0.069188	0.9454
LOGLADSMSE	-1.496486	0.598998	-2.498316	0.0201
LOGBBS	-1.351777	1.317210	-1.026243	0.3155
LOGFDI	-0.287526	0.160544	-1.790946	0.0865
C	3.979515	2.093470	1.900918	0.0699

Source: E-VIEW 9.0 Output, 2025.

Table 9 presents the ARDL Cointegration and Long-Run Form results, highlighting how key financial inclusion indicators have influenced SME growth in Nigeria between 1994 and 2024. Using the ARDL model, the study examined the effects of RBD, LRB, LADSMSE, BBS, and FDI on SME output, both in the short and long term. Each variable's impact was assessed at the 5% significance level to establish its statistical importance.

The results show that rural bank deposits (RBD) have a positive and significant impact on SME output both in the short and long run. A short-run coefficient of 0.6802 ($p = 0.0001$) indicates immediate gains, while the long-run coefficient of 2.8678 ($p = 0.0095$) shows a stronger, lasting effect. This supports the Inclusive Growth Theories, highlighting the role of rural deposits in expanding SME access to finance. Studies by Eze and Chukwuma (2024) and Adegbite and Oladipo (2024) confirm this finding. Therefore, the null hypothesis (Ho1) is rejected in favour of a significant relationship.

Loans disbursed by rural branches (LRB) show a positive but statistically insignificant effect on SME output in both the short run (0.0079, $p = 0.9453$) and long run (0.0335, $p = 0.9454$). This contradicts the Credit Rationing Theory and may reflect poor loan targeting, limited access, or rigid conditions. While studies like Hassan and Yusuf (2025) report significant effects in specific sectors, others such as Obi and

Akinyele (2024) highlight challenges like high interest rates. As a result, the null hypothesis (Ho2) is not rejected, suggesting rural loan schemes currently have little impact on SME productivity in Nigeria.

Loans and advances to SMEs (LADSMSE) show a negative and statistically significant impact on SME output, both in the short run (-0.3549, p = 0.0228) and long run (-1.4965, p = 0.0201). While Adegbite and Oladipo (2024) reported positive effects, others like Umar and Nwankwo (2024) noted inefficiencies in credit delivery. The null hypothesis (Ho3) is rejected, but the negative result points to an urgent need for improved SME credit allocation and monitoring systems.

Bank branch spread (BBS) shows negative and statistically insignificant effects on SME output in both the short run (-0.3206, p = 0.1669) and long run (-1.3518, p = 0.3155). Without SME-focused services, financial literacy programs, or tailored products, new branches may have limited impact. Studies offer mixed views—Bello and Olatunji (2025) found positive effects in rural areas, while Okonkwo et al. (2024) noted significance only in financially literate states. As such, the null hypothesis (Ho4) is not rejected, highlighting the need for complementary support systems.

The financial deepening indicator (FDI), measured by the money supply-to-GDP ratio, shows a negative and significant short-run effect on SME output (-0.0682, p = 0.0201) and a marginally significant long-run effect (-0.2875, p = 0.0865). While Adamu and Suleiman (2025) reported similar negative impacts, Johnson and Adebayo (2025) found long-run gains when institutional issues were addressed. Thus, H05 is rejected in the short run but not definitively in the long run.

CONCLUSION

This study concludes that financial inclusion, though widely promoted as a catalyst for SME development, exhibits mixed impacts across its components in Nigeria. While rural bank deposits significantly enhance SME growth, other variables—such as rural loans, loan advances, branch proliferation, and financial deepening—require policy refinement to be effective. These findings reveal systemic challenges in the transmission mechanisms of financial inclusion and underscore the necessity for targeted reforms in SME financing frameworks.

RECOMMENDATIONS

The following recommendations are made:

1. Policymakers should strengthen policies that incentivize savings in rural banks and improve deposit mobilization, such as interest-bearing accounts and mobile banking solutions.
2. Enhance loan monitoring, improve borrower screening, and introduce flexible repayment structures to increase the effectiveness of LRBs.
3. Provide financial literacy training for SMEs, enforce conditional disbursement based on business plans, and monitor loan usage to curb misuse.
4. Focus on branch specialization in SME services, integrate digital banking, and establish SME helpdesks within rural bank branches.
5. Introduce inclusive financial policies that ensure credit distribution prioritizes SMEs and address institutional bottlenecks in the financial sector.

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