COMMERCIAL BANK FINANCING

Commercial Bank Financing and the Performance of Small and Medium Enterprises in Nigeria

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Abstract

This study examined the effect of commercial bank financing on the performance of small and medium enterprises (SMEs) in Nigeria. The study was motivated by the significant contribution of SMEs to employment generation, economic growth, and industrial development, alongside the persistent difficulty many enterprises face in accessing appropriate and affordable financing. Specifically, the study investigated the effects of volume of bank credit to SMEs (VBCSME), interest rate on SME loans (INT), loan tenure (LTEN), credit accessibility index (CAI), and collateral requirement ratio (CRR) on SME output (SMEO) in Nigeria. An ex-post facto research design was adopted, using annual time series data covering the period from 2001 to 2025. Data relating to commercial bank financing variables were obtained from the Central Bank of Nigeria Statistical Bulletin, while SME output data were sourced from the National Bureau of Statistics. Data on the credit accessibility index were obtained from Enhancing Financial Innovation and Access. The data were analysed using descriptive statistics, correlation analysis, diagnostic tests, and Ordinary Least Squares (OLS) regression with EViews 9.0. The findings established that commercial bank financing, when considered jointly, had a significant effect on SME output in Nigeria. However, the individual financing indicators produced varying results. VBCSME exerted a negative and statistically insignificant effect on SMEO, suggesting that increased credit volume alone did not significantly enhance SME performance. INT had a significant negative effect, indicating that high borrowing costs constrained SME output. LTEN showed a positive but insignificant effect, implying that loan duration alone did not significantly determine enterprise performance. CAI exerted a significant positive effect, demonstrating that improved access to credit contributed to SME growth and productivity. CRR had a positive but insignificant effect on SMEO. The study concluded that affordable, accessible, and flexible financing was critical to improving SME performance. It recommended that commercial banks reduce lending costs, expand credit access, provide flexible loan arrangements, and adopt alternative financing approaches that reduce dependence on conventional collateral requirements. The study contributes to knowledge by showing that the accessibility and affordability of finance are more important for SME performance than credit volume alone.

Keywords: commercial bank financing; small and medium enterprises; SME performance; SME output; bank credit; interest rate; loan tenure; credit accessibility; collateral requirements; Nigeria

1 Introduction

Commercial bank financing remains a critical determinant of small and medium enterprises (SMEs) performance in Nigeria, as SMEs contribute to employment generation, income creation, innovation, and economic diversification. Despite their importance, many SMEs experience financing constraints that limit expansion, productivity, and competitiveness. Commercial banks are expected to channel funds to productive sectors, yet concerns remain regarding the adequacy and effectiveness of credit supplied to SMEs. Beck (2022) identified access to finance as a major constraint to SME development in emerging economies. The volume of bank credit to SMEs (VBCSME) is important because adequate

financing supports working capital, asset acquisition, technological investment, and expansion. However, information asymmetry and perceived credit risks often discourage banks from extending sufficient credit to small businesses (Olayemi, 2022).

The cost of financing is equally important because interest rate on SME loans (INT) influences borrowing decisions, profitability, investment, and repayment capacity. High lending rates increase the financial burden on enterprises and may discourage SMEs from obtaining formal credit. Egbetunde (2023) reported that elevated interest rates reduce SME profitability and discourage long-term investment, while Akinlo (2023) observed that high borrowing costs can increase default risks and weaken financial sustainability. Loan tenure (LTEN) also determines the effectiveness of bank financing because the repayment period should correspond with the nature and duration of business investments. Short-term loans may create repayment pressures and restrict long-term investments, whereas suitable longer-term financing can provide SMEs with flexibility to stabilize operations and achieve economies of scale. Nwankwo (2022) noted that the dominance of short-term lending limits SME investment in capital-intensive activities.

Credit accessibility is another important financing condition affecting SME performance. The credit accessibility index (CAI) reflects the ease with which enterprises obtain financial resources from formal institutions. Nigerian SMEs often face complex lending procedures, documentation requirements, limited financial literacy, and inadequate financial records. Demirgüç-Kunt (2023) explained that structural weaknesses in financial systems can restrict SME access to formal credit. Although digital financial services have improved financial inclusion, technological and infrastructural limitations continue to create barriers. Soyinka (2024) argued that digital finance has expanded access without completely eliminating financing constraints. Collateral requirement ratio (CRR) is also significant because stringent collateral conditions may exclude viable SMEs from formal credit markets. Okoye (2022) emphasized that excessive collateral requirements limit access to bank financing and restrict enterprise expansion.

SME output (SMEO), reflecting enterprise productive capacity and performance, is closely connected to these financing conditions. Adequate and affordable finance can enable SMEs to acquire productive assets, adopt technology, expand operations, and improve competitiveness. However, credit availability does not necessarily guarantee improved performance when borrowing costs are high, loan periods are inappropriate, access procedures are restrictive, or collateral requirements are excessive. Thus, the combined influence of credit volume, interest rates, loan tenure, accessibility, and collateral requirements requires empirical investigation to determine their actual effects on SME output in Nigeria.

The problem is further reflected in gaps within existing empirical studies. Much of the literature focuses on credit availability or volume without adequately examining the broader financing conditions that determine whether bank credit translates into improved SME performance. Ibrahim (2023) identified limited attention to broader financial conditions, while Musa (2024) observed that credit accessibility indicators remain insufficiently examined. Yakubu (2023) identified collateral requirements as an underexplored determinant of SME productivity, and Bello (2025) noted that previous studies have not sufficiently captured the combined effects of multiple financing variables. Consequently, this study addresses the gap by employing OLS regression to examine the individual and joint effects of VBCSME, INT, LTEN, CAI, and CRR on SMEO in Nigeria.

2 Literature review

2.1 Conceptual review

2.1.1 Commercial bank financing

Commercial bank financing refers to financial resources provided by deposit money banks to businesses through loans, overdrafts, and other credit facilities under agreed conditions, including interest rates, repayment periods, and collateral requirements. It represents an important source of external finance for small and medium enterprises (SMEs), particularly in developing economies where alternative sources of funding are limited. In Nigeria, SMEs rely on commercial bank financing to obtain working capital, acquire productive assets, expand operations, and improve productivity. However, access to such financing is often constrained by perceived credit risks, inadequate financial records, information asymmetry, and weak collateral. Beck (2022) noted that bank-based financial systems can help reduce financing constraints by improving SMEs' access to structured financial resources.

The effectiveness of commercial bank financing depends on the volume, cost, duration, accessibility, and conditions attached to credit. Adequate credit enables SMEs to undertake productive investments, while high interest rates increase borrowing costs and may reduce profitability and investment capacity. Similarly, short loan tenures can create repayment pressures and limit the ability of SMEs to finance long-term projects. Ogujiuba (2022) observed that Nigerian banks often favour larger and more established firms, thereby leaving many SMEs underserved. Credit accessibility is also affected by bureaucratic procedures, documentation requirements, and limited financial literacy, while stringent collateral requirements may exclude viable businesses that lack sufficient assets. Demirgüç-Kunt et al. (2023) emphasized that improving financial inclusion is essential for expanding SMEs' access to formal credit. Therefore, commercial bank financing should be evaluated not merely by the amount of credit available, but by whether financing is affordable, accessible, appropriately structured, and suitable for the operational and investment needs of SMEs. Adebayo (2024) argued that reducing financing costs and improving lending conditions are essential for strengthening SME growth and productivity.

2.1.2 Performance of small and medium enterprises in Nigeria

The performance of small and medium enterprises (SMEs) is important to Nigeria's economic development because of their contributions to employment, income generation, industrialization, and national output. SME output (SMEO) provides a measurable indication of the productive capacity of these enterprises and their contribution to economic activities. However, the sector continues to operate below its potential due to financial, infrastructural, managerial, technological, and market-related constraints. Access to adequate finance enables SMEs to obtain working capital, acquire productive assets, adopt technology, and expand operations, whereas financing difficulties restrict investment and productivity. Akingunola (2022) emphasized that financial constraints limit SME investment in equipment and technology, thereby weakening productivity. In addition, inadequate electricity, poor transportation networks, and other infrastructural deficiencies increase operating costs and reduce the ability of SMEs to produce efficiently. Akinwale et al. (2022) argued that infrastructure limitations significantly constrain SME productivity and competitiveness in Nigeria.

Human capital, managerial competence, technological adoption, and market access also influence SME output. Entrepreneurs with appropriate managerial knowledge and skills are better positioned to allocate resources efficiently, respond to changing market conditions, and sustain business growth.

Similarly, technological adoption and innovation can improve production efficiency, reduce costs, and enhance competitiveness, although financial and technical limitations often prevent Nigerian SMEs from adopting modern technologies. Ogundele and Opeifa (2024) highlighted the importance of managerial competence and entrepreneurial orientation in improving SME performance. Furthermore, access to wider markets enables enterprises to increase demand, expand production, and improve output, while weak distribution networks, limited market linkages, and intense competition can restrict growth. Fatoki (2023) identified limited customer reach and market opportunities as persistent barriers to SME performance. Therefore, improving SME output requires coordinated efforts to enhance access to finance, infrastructure, managerial capabilities, technology, and markets, thereby enabling SMEs to operate efficiently and contribute more significantly to sustainable economic development in Nigeria.

2.2 Theoretical review

The study is anchored on financial intermediation theory and credit rationing theory, which explain how commercial bank financing conditions, credit accessibility, and lending constraints influence SME output and performance in Nigeria.

2.2.1 Financial intermediation theory

Financial Intermediation Theory, developed by Gurley and Shaw (1960), explains how financial institutions facilitate the transfer of funds from surplus to deficit units within an economy. Banks perform essential functions such as mobilizing savings, assessing borrowers, monitoring investments, managing risks, and reducing transaction costs. In Nigeria, commercial banks therefore serve as important channels through which financial resources are provided to small and medium enterprises (SMEs). The theory suggests that the volume of credit, interest rates, loan tenure, credit accessibility, and collateral requirements can influence the extent to which SMEs obtain and effectively utilize finance. Adequate and affordable credit can support investment, expansion, and productivity, while high borrowing costs, restrictive conditions, and limited accessibility may constrain enterprise performance. The theory is relevant to this study because it explains how efficient financial intermediation can improve SME output through effective credit allocation and reduced financing constraints (Allen et al., 2023).

2.2.2 Credit rationing theory

Credit Rationing Theory, developed by Stiglitz and Weiss (1981), explains how information asymmetry and market imperfections influence banks' lending decisions. The theory argues that banks may restrict credit rather than increase interest rates because higher rates can attract riskier borrowers and increase default risk. SMEs are particularly affected because they often have inadequate financial records, limited credit histories, and insufficient collateral. Credit accessibility and collateral requirements therefore represent important dimensions of credit rationing, as restrictive procedures and security conditions can prevent viable SMEs from obtaining finance. Nwosu et al. (2023) noted that stringent collateral requirements reduce SME access to credit and limit productive capacity in Nigeria. The theory is relevant to this study because restricted credit can reduce SMEs' ability to invest, expand, and improve output, while stronger credit information systems can reduce information asymmetry and promote efficient credit allocation.

2.3 Empirical review

The empirical review examined previous studies on commercial bank financing and SME performance, highlighting their methodologies, findings, identified gaps, and relevance to the present study. Omodero and Nwangwa (2025) examined fintech adoption and SME performance in Nigeria, focusing on digital financial services, credit accessibility, and SME output (SMEO) over 2015–2024. Primary data were collected through structured questionnaires and analysed using regression techniques. Findings showed that fintech adoption significantly improved credit access and SME output. The study recommended expanding digital financial solutions to strengthen financial inclusion and enhance SME productivity. Adegboye and Fasanya (2024) investigated the effect of loan tenure on SME performance in Nigeria using loan tenure (LTEN), volume of bank credit to SMEs (VBCSME), and SME output (SMEO) for 2000–2022. Secondary data obtained from the Central Bank of Nigeria were analysed using regression techniques. Findings indicated that longer loan tenures significantly improved SME output. The study recommended flexible repayment structures to support SME expansion.

Ubesie and Ezeanyeji (2024) examined the relationship between bank credit and SME output in Nigeria using VBCSME, lending rate, and SME output (SMEO) for 1995–2022. Time-series data were obtained from the Central Bank of Nigeria and analysed using Ordinary Least Squares (OLS). Findings revealed a positive and significant relationship between bank credit and SME output. The study recommended increased credit allocation to SMEs to enhance productivity and growth. Okafor et al. (2024) examined asset-based lending and SME growth in Nigeria, focusing on loan size, collateral value, and SME output (SMEO) over 2005–2022. Secondary data were sourced from Central Bank of Nigeria publications and financial reports and analysed using regression techniques. Findings showed that limited SME assets restricted credit access and reduced output. The study recommended reforms to secured lending frameworks to improve SME financing.

Adebayo (2024) investigated the relationship between interest rates and SME performance in Nigeria, focusing on interest rate on SME loans (INT) and SME output (SMEO) over 1995–2022. Central Bank of Nigeria time-series data were analysed using Ordinary Least Squares (OLS). Findings indicated that high interest rates significantly reduced SME output by discouraging borrowing and investment. The study recommended interest-rate moderation policies to improve SME financing and performance. Soyinka (2024) examined digital financial services and SME credit accessibility and performance in Nigeria, using fintech adoption, credit accessibility, and SME output (SMEO) for 2015–2023. Primary data were collected through surveys and analysed using regression techniques. Findings revealed that digital finance significantly improved credit access and SME output. The study concluded that fintech promotes financial inclusion and recommended wider adoption of digital financial solutions to support SME growth.

Ogunleye and Saliu (2024) investigated macroeconomic instability, bank lending behaviour, and SME performance in Nigeria using inflation, interest-rate volatility, credit to SMEs, and SME output (SMEO) for 1990–2022. Secondary data from the Central Bank of Nigeria were analysed using OLS. Findings showed that macroeconomic instability reduced credit availability and SME output. The study recommended stable macroeconomic policies to ensure consistent credit flows and support enterprise growth. Adeola and Evans (2023) examined financial inclusion and SME performance using financial inclusion index, credit access, and SME output (SMEO) for 2005–2021. Panel data obtained from financial databases were analysed using econometric techniques. Findings indicated that improved financial inclusion significantly enhanced SME output and productivity. The study concluded that access to formal financial services is essential for enterprise growth and recommen-

ded stronger financial inclusion policies to expand SME financing opportunities. A study by Okoye and Ezejiofor (2023) examined credit management practices and SME productivity in Nigeria using loan utilization, repayment behaviour, and SME output (SMEO) for 2010–2022. Primary data were collected through questionnaires and analysed using regression analysis. Findings revealed that effective credit management significantly improved SME output and operational efficiency. The study concluded that sound financial management enhances enterprise performance and recommended improved credit management practices among SME operators.

3 Research methodology

This study adopted an ex-post facto research design because it relied on historical time series data to examine the relationship between commercial bank financing and SME performance in Nigeria. The design was appropriate because the variables, namely volume of bank credit to SMEs (VBCSME), interest rate on SME loans (INT), loan tenure (LTEN), credit accessibility index (CAI), collateral requirement ratio (CRR), and SME output (SMEO), were observed as they occurred naturally without manipulation. The population comprised all Small and Medium Enterprises operating in Nigeria, represented through aggregated national data reflecting SME activities across manufacturing, agriculture, trade, and services. The sample consisted of the identified financial and performance indicators selected through purposive sampling based on their relevance to the research objectives and availability of consistent data. The study covered twenty-five years, from 2001 to 2025, thereby capturing changes in financial sector policies, lending practices, and SME financing conditions.

Secondary data were obtained from credible official sources. Data on VBCSME, INT, LTEN, and CRR were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, SMEO data were obtained from the National Bureau of Statistics (NBS), while CAI data were sourced from Enhancing Financial Innovation and Access (EFInA). Data analysis was conducted using EViews 9.0 and Ordinary Least Squares (OLS) regression. Descriptive statistics, including mean, standard deviation, minimum, and maximum values, were used to summarize the variables, while correlation analysis examined their relationships. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values below 10 indicating no serious multicollinearity. Model adequacy was evaluated using R squared, Adjusted R squared, F statistic, and Durbin Watson statistics. The Augmented Dickey Fuller (ADF) test was employed to determine stationarity, with variables expected to be stationary at level I(0) or first difference I(1). The Johansen Cointegration Test was subsequently used to establish the existence of long run relationships among the variables. Finally, the OLS model estimated the magnitude, direction, and statistical significance of the effects of VBCSME, INT, LTEN, CAI, and CRR on SMEO in Nigeria.

The functional model was specified as:

$$SMEO = f(VBCSME,\ INT,\ LTEN,\ CAI,\ CRR) \tag{1}$$

The econometric model was expressed as:

$$SMEO_t = \beta_0 + \beta_1 VBCSME_t + \beta_2 INT_t + \beta_3 LTEN_t + \beta_4 CAI_t + \beta_5 CRR_t + \mu_t \tag{2}$$

where *SMEO* represents SME output; *VBCSME*, *INT*, *LTEN*, *CAI* and *CRR* represent the financing variables; β_0 is the intercept, β_1–β_5 are the coefficients, and μ_t is the error term.

4 Results and discussion

Understanding how commercial bank financing influences SME performance is essential for assessing enterprise growth in Nigeria. This study examined the effects of VBCSME, INT, LTEN, CAI, and CRR on SMEO from 2001 to 2025. Ordinary Least Squares regression was employed using EViews 9.0. Diagnostic analyses included descriptive statistics, correlation analysis, multicollinearity, stationarity, and cointegration tests to establish the reliability of the model and determine the short and long run relationships among the study variables.

4.1 Descriptive statistics

This test summarized the distribution and variability of VBCSME, INT, LTEN, CAI, CRR, and SMEO, using mean, minimum, maximum, standard deviation, skewness, and kurtosis values.

Table 1. Descriptive statistics.

	LOGSMEO	LOGVBCSME	LOGINT	LOGLTEN	LOGCAI	LOGCRR
Mean	2.331816	2.993438	1.279562	1.182451	1.722819	2.169046
Median	2.350791	3.012837	1.278067	1.186391	1.737193	2.171141
Maximum	2.584467	3.195900	1.339451	1.276921	1.902003	2.254064
Minimum	1.995635	2.690196	1.206556	1.071882	1.468347	2.068557
Std. Dev.	0.176755	0.149827	0.040340	0.059995	0.129667	0.056495
Skewness	-0.308765	-0.429078	-0.132560	-0.177034	-0.370055	-0.159730
Kurtosis	1.938536	2.066158	1.825517	1.912800	2.000726	1.833103
Jarque-Bera	1.570883	1.675512	1.510102	1.361841	1.610739	1.524690
Probability	0.455918	0.432680	0.469987	0.506151	0.446923	0.466571
Sum	58.29540	74.83596	31.98904	29.56128	43.07047	54.22616
Sum Sq. Dev.	0.749812	0.538753	0.039056	0.086386	0.403523	0.076602
Observations	25	25	25	25	25	25

Source: EViews 9.0 output, 2026.

Table 1 presents the descriptive statistics for SMEO, VBCSME, INT, LTEN, CAI, and CRR based on 25 annual observations from 2001 to 2025. The variables were transformed logarithmically to reduce scale differences and improve estimation reliability. The results showed moderate variations, with relatively low standard deviations across the variables, indicating general stability during the study period. All variables exhibited slight negative skewness, while kurtosis values below three suggested relatively flat distributions. Furthermore, the Jarque-Bera probability values for all variables exceeded 0.05, confirming normality. Overall, the results indicated that the variables were stable, normally distributed, and suitable for further OLS analysis.

4.2 Correlation matrix

The test examined relationships among VBCSME, INT, LTEN, CAI, CRR, and SMEO, assessing direction, strength, and potential multicollinearity before regression analysis using a 0.80 threshold.

Table 2. Correlation matrix.

	LOGSMEO	LOGVBCSME	LOGINT	LOGLTEN	LOGCAI	LOGCRR
LOGSMEO	1.000000					
LOGVBCSME	0.498616	1.000000				
LOGINT	-0.484271	-0.376588	1.000000			
LOGLTEN	0.496538	0.493361	-0.489130	1.000000		
LOGCAI	0.499539	0.399166	-0.379320	0.395139	1.000000	
LOGCRR	-0.484877	-0.376009	0.497640	-0.490087	-0.380779	1.000000

Source: EViews 9.0 output, 2026.

Table 2 presents the correlation matrix among SMEO, VBCSME, INT, LTEN, CAI, and CRR. The coefficients ranged from -0.490087 to 0.499539, indicating moderate relationships among the variables. SMEO had positive relationships with VBCSME, LTEN, and CAI, while its relationships with INT and CRR were negative. The explanatory variables also recorded moderate positive and negative associations, reflecting meaningful relationships among financing indicators. None of the correlation coefficients exceeded the 0.80 threshold, indicating the absence of serious multicollinearity. Therefore, the variables were considered appropriate for inclusion in the OLS regression model without significant risk of coefficient distortion.

4.3 Variance inflation factor (VIF)

The VIF test assessed multicollinearity among VBCSME, INT, LTEN, CAI, and CRR, with values below 10 indicating acceptable relationships and suitability for reliable regression estimation.

Table 3. Variance inflation factor (VIF) test.

Variable	Coefficient variance	Uncentered VIF	Centered VIF
C	0.065468	23.10593	NA
LOGVBCSME	0.029274	92.80099	2.226479
LOGINT	0.106651	61.68687	5.880301
LOGLTEN	0.019141	94.68970	2.334365
LOGCAI	0.046598	49.07873	2.654524
LOGCRR	0.076491	12.70936	7.821820

Note: Sample 2001–2025; 25 observations. Source: EViews 9.0 output, 2026.

Table 3 presents the VIF results for VBCSME, INT, LTEN, CAI, and CRR. The centered VIF values were 2.226479, 5.880301, 2.334365, 2.654524, and 7.821820, respectively. All values were below the threshold of 10, indicating that serious multicollinearity was absent among the explanatory variables. Although INT and CRR recorded relatively higher VIF values, they remained within acceptable limits. The findings therefore confirmed that the financing variables were sufficiently independent and suitable for OLS regression estimation. Consequently, the estimated individual effects of commercial bank financing indicators on SMEO could be interpreted reliably without significant distortion from multicollinearity.

4.4 Model validity test

Model validity tests assessed the overall fitness and explanatory power of the model, determining whether VBCSME, INT, LTEN, CAI, and CRR collectively explained variations in SMEO during 2001 to 2025.

Table 4. Model validity (diagnostic) tests.

Test	Statistic	Value	Probability
Breusch-Godfrey serial correlation LM test	F-statistic	4.676550	Prob. F(2,17) = 0.0841
	Obs*R-squared	8.872865	Prob. Chi-square(2) = 0.0718
Heteroskedasticity test: Breusch-Pagan-Godfrey	F-statistic	2.106165	Prob. F(5,19) = 0.1092
	Obs*R-squared	8.915113	Prob. Chi-square(5) = 0.1125
	Scaled explained SS	5.697638	Prob. Chi-square(5) = 0.3368
Ramsey RESET test (squares of fitted values)	t-statistic (df 18)	0.273610	0.7875
	F-statistic (1, 18)	0.074863	0.7875
	Likelihood ratio (df 1)	0.103760	0.7474

Source: EViews 9.0 output, 2026.

The Breusch-Godfrey Serial Correlation LM Test produced an F-statistic probability of 0.0841 and Chi-square probability of 0.0718, both exceeding 0.05, indicating no significant serial correlation. The Breusch-Pagan-Godfrey test recorded probabilities of 0.1092 and 0.1125, confirming the absence of heteroskedasticity. The Ramsey RESET Test produced a probability of 0.7875, indicating that the model specification was appropriate. The results therefore suggest that the regression model was free from serial correlation, heteroskedasticity, and specification errors, supporting reliable estimation of SMEO, VBCSME, INT, LTEN, CAI, and CRR.

4.5 Stability test (CUSUM and CUSUMSQ)

CUSUM and CUSUMSQ tests assessed the stability of regression coefficients from 2001 to 2025. Plots within the 5% critical boundaries indicated model stability and consistent relationships among variables.

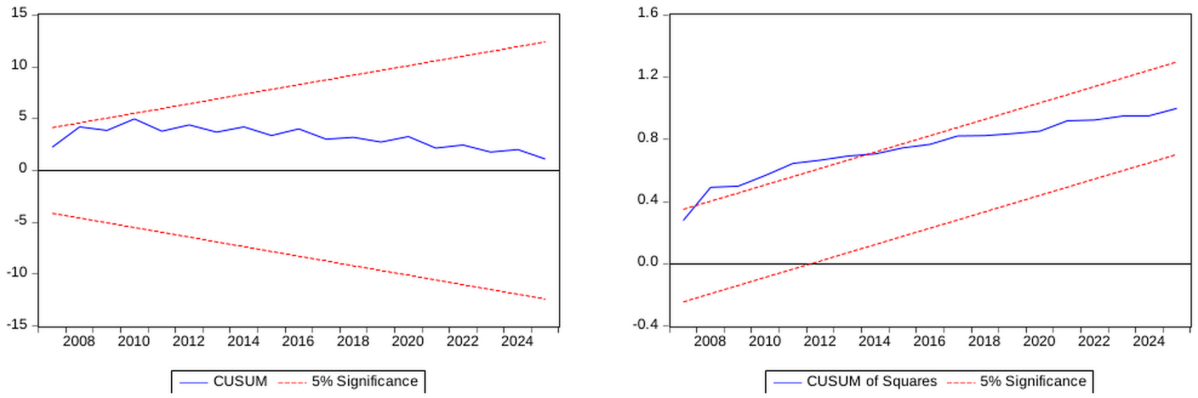


Figure 1. Stability tests: (a) CUSUM and (b) CUSUM of squares, with 5% significance bounds (source: EViews 9.0 output, 2026).

Figure 1 presents the CUSUM and CUSUMSQ stability tests conducted to assess whether the OLS regression coefficients remained stable from 2001 to 2025. The tests were important because changes in banking reforms, credit policies, and lending conditions could affect the relationship between VBCSME, INT, LTEN, CAI, CRR, and SMEO. The results showed that both CUSUM and CUSUM-SQ plots remained within the 5% critical boundaries throughout the study period. This indicates the absence of significant structural instability and confirms that the estimated coefficients remained stable. The OLS model was therefore considered reliable and suitable for examining commercial bank financing and SME performance in Nigeria.

4.6 Group unit root test

The Group Unit Root Test examined stationarity of VBCSME, INT, LTEN, CAI, CRR, and SMEO from 2001 to 2025. A probability below 0.05 indicated stationarity, while above 0.05 indicated non-stationarity.

Table 5. Group unit root test.

Method	Level: statistic	Level: prob.	First difference: statistic	First difference: prob.
Levin, Lin & Chu t*	−1.22562	0.1102	3.89886	1.0000
Im, Pesaran and Shin W-stat	−16.4985	0.0783	−6.02172	0.0000
ADF – Fisher Chi-square	17.730	0.1078	446.483	0.0000
PP – Fisher Chi-square	18.8449	0.2781	77.5968	0.0000

Note: Series LOGSMEO, LOGVBCSME, LOGINT, LOGLTEN, LOGCAI, LOGCRR; sample 2001–2025; individual effects; 6 cross-sections at level and 5 at first difference (as reported). Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution; the other tests assume asymptotic normality. Source: EViews 9.0 output, 2026.

Table 5 presents the Group ADF Unit Root Test results for SMEO, VBCSME, INT, LTEN, CAI, and CRR. At level, all probability values exceeded 0.05, indicating non-stationarity. However, after first differencing, the IPS, ADF-Fisher, and PP-Fisher tests recorded probabilities of 0.0000, leading to rejection of the unit root hypothesis. The variables were therefore stationary at first difference and integrated of order one, I(1). This confirmed their suitability for further econometric analysis,

particularly cointegration testing, to establish whether a stable long-run relationship existed between commercial bank financing indicators and SME output in Nigeria.

4.7 Johansen cointegration test

The Johansen Cointegration Test examined long-run relationships among VBCSME, INT, LTEN, CAI, CRR, and SMEO from 2001 to 2025, using trace and maximum eigenvalue statistics.

Table 6. Johansen cointegration test.

Hypothesized no. of CE(s)	Eigen-value	Trace statistic	0.05 critical value	Prob.	Max-eigen statistic	0.05 critical value	Prob.
None*	0.999995	576.1026	95.75366	0.0001	280.0319	40.07757	0.0001
At most 1*	0.999663	296.0707	69.81889	0.0001	183.9280	33.87687	0.0001
At most 2*	0.913692	112.1427	47.85613	0.0000	56.34609	27.58434	0.0000
At most 3*	0.738912	55.79666	29.79707	0.0000	30.88665	21.13162	0.0016
At most 4*	0.514491	24.91000	15.49471	0.0014	16.61884	14.26460	0.0208
At most 5*	0.302662	8.291159	3.841466	0.0040	8.291159	3.841466	0.0040

Note: Sample (adjusted) 2003–2025, 23 observations; linear deterministic trend; lags interval 1 to 1. * denotes rejection of the hypothesis at the 0.05 level; p-values from MacKinnon-Haug-Michelis (1999). Both tests indicate 6 cointegrating equations. Source: EViews 9.0 output, 2026.

Table 6 presents the Johansen Cointegration Test results examining the long run relationship among SMEO, VBCSME, INT, LTEN, CAI, and CRR. The trace test rejected the null hypothesis of no cointegration, as the trace statistic of 576.1026 exceeded the 5% critical value of 95.75366, with a probability of 0.0001. The maximum eigenvalue test also rejected the null hypothesis, with a statistic of 280.0319 exceeding the critical value of 40.07757 and probability of 0.0001. Both tests confirmed cointegration among the variables, indicating a stable long run equilibrium relationship between commercial bank financing indicators and SME output from 2001 to 2025.

4.8 Ordinary least squares regression

The OLS regression estimated the individual and joint effects of VBCSME, INT, LTEN, CAI, and CRR on SMEO. Significance was determined using probability values below 0.05, while coefficient signs indicated relationship direction.

Table 7. Ordinary least squares regression (dependent variable: LOGSMEO).

Variable	Coefficient	Std. error	t-statistic	Prob.
C	0.858811	0.255868	3.356468	0.0033
LOGVBCSME	−0.039791	0.171095	−0.232565	0.8186
LOGINT	−0.958150	0.326574	−2.933944	0.0085
LOGLTEN	0.006406	0.138352	0.046300	0.9636
LOGCAI	1.244794	0.215865	5.766530	0.0000
LOGCRR	0.307047	0.276570	1.110195	0.2808
R-squared	0.999821		Mean dependent var	2.331816

Variable	Coefficient	Std. error	t-statistic	Prob.
Adjusted R-squared	0.999773		S.D. dependent var	0.176755
S.E. of regression	0.002661		Akaike info criterion	−8.814304
Sum squared resid	0.000135		Schwarz criterion	−8.521774
Log likelihood	116.1788		Hannan-Quinn criterion	−8.733169
F-statistic	21166.92		Durbin-Watson stat	3.026307
Prob(F-statistic)	0.000000			

Note: Least squares; sample 2001–2025; 25 observations. Source: EViews 9.0 output, 2026.

Table 7 presents the OLS regression results on the effect of VBCSME, INT, LTEN, CAI, and CRR on SMEO in Nigeria from 2001 to 2025, using 25 observations. The R^2 of 0.999821 indicates that the explanatory variables jointly explain 99.98% of variations in SMEO, while the adjusted R^2 of 0.999773 confirms strong explanatory power. The F statistic of 21166.92 with a probability of 0.000000 indicates that the model is statistically significant at 5%. The Durbin Watson statistic of 3.026307 suggests mild negative serial correlation, while the regression standard error of 0.002661 indicates close correspondence between predicted and actual SMEO values.

The finding revealed that VBCSME had a negative and insignificant effect on SMEO, with a coefficient of -0.039791 and probability value of 0.8186. This implies that increased bank credit did not significantly improve SME output during the study period. The finding is consistent with Financial Intermediation Theory, which suggests that credit improves performance when efficiently allocated and productively utilised. It also supports Credit Rationing Theory, which highlights lending constraints affecting SMEs. The result differs from Ubesie and Ezeanyeji (2024), who found a positive and significant effect of bank credit on SME output. The difference may reflect variations in economic conditions and methodologies.

The finding showed that INT had a negative and significant effect on SMEO, with a coefficient of -0.958150 and probability value of 0.0085. This indicates that higher interest rates significantly reduce SME output by increasing borrowing costs and limiting funds available for productive investment. The finding supports Financial Intermediation Theory because high financing costs can reduce the effectiveness of financial resource allocation. It also agrees with Credit Rationing Theory, which explains how costly lending conditions can restrict SME financing. The result is consistent with Adebayo (2024), who found that high interest rates significantly reduced SME output in Nigeria, and Ogunleye and Saliu (2024), who reported similar negative effects.

The finding indicated that LTEN had a positive but insignificant effect on SMEO, with a coefficient of 0.006406 and probability value of 0.9636. The positive coefficient suggests that longer repayment periods may provide SMEs with greater financial flexibility and reduce repayment pressure. However, the insignificant result indicates that loan tenure alone did not meaningfully influence SME output during the study period. The finding is consistent with Financial Intermediation Theory, which recognises appropriate loan structures as important for effective financing. It contrasts with Adegboye and Fasanya (2024), who found that longer loan tenure significantly improved SME output. Differences in periods, economic conditions, and methodologies may explain the contrasting results.

The finding revealed that CAI had a positive and significant effect on SMEO, with a coefficient of 1.244794 and probability value of 0.0000. This indicates that improved credit accessibility significantly enhances SME output by enabling enterprises to finance expansion, acquire productive

resources, and support business operations. The finding strongly supports Financial Intermediation Theory because accessible financial resources facilitate the movement of funds toward productive economic activities. It also supports Credit Rationing Theory, which emphasises the negative effects of restricted credit access. The result agrees with Omodero and Nwangwa (2025), Soyinka (2024), and Adeola and Evans (2023), who found that improved financial access and inclusion enhanced SME performance and productivity.

The finding showed that CRR had a positive but insignificant effect on SMEO, with a coefficient of 0.307047 and probability value of 0.2808. This indicates that collateral requirements did not significantly determine SME output during the study period. The finding relates to Credit Rationing Theory, which explains how collateral is used by banks to manage lending risks and information asymmetry. It also relates to Financial Intermediation Theory because restrictive lending conditions may affect efficient credit allocation. The result contrasts with Okafor et al. (2024) and Nwosu et al. (2023), who found that collateral constraints reduced SME credit access and productive capacity. Differences may reflect other financing conditions influencing SME performance.

5 Conclusion

The study concluded that commercial bank financing significantly influenced SME performance in Nigeria, although the effects varied across financing indicators. VBCSME had no significant effect, indicating that increasing credit volume alone did not guarantee improved SME output. INT had a significant negative effect, showing that high borrowing costs constrained investment and productivity. LTEN and CRR had positive but insignificant effects, suggesting that these conditions did not independently determine SME performance. However, CAI had a significant positive effect, confirming that improved access to formal finance enhanced SME output. The study therefore concluded that affordable credit, accessible financing, flexible lending conditions, and effective financial management are essential for improving SME performance.

6 Recommendations

Based on the findings of the study, the following recommendations were made:

1. Since VBCSME had no significant effect on SMEO, commercial banks should focus on effective credit utilization by providing financial advisory services, monitoring, and business support to SMEs.
2. Given the significant negative effect of INT on SMEO, financial institutions should provide affordable SME loans with favourable interest rates to encourage investment and productivity.
3. Since LTEN had no significant effect, banks should adopt flexible repayment periods that align with SME cash flows and business cycles.
4. Based on the significant positive effect of CAI, government and financial institutions should simplify loan procedures and expand digital financing platforms.
5. Since CRR had no significant effect, banks should adopt alternative credit assessment methods alongside collateral requirements to improve SME financing access.

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