



Research Article

Effect of Business Credit Availability on SMEs Growth of Selected Small and Medium Enterprises in North Central, Nigeria.

Adah, Alexander Agbaji^{1*} Ajam, Peter Ngbede² Emmanuel Adah John³

^{1,2,3}Department of Banking and Finance, Benue State Polytechnic, Ugbokolo, Benue State, Nigeria

Corresponding Author Email: alexadah80@yahoo.com

Abstract-Small and medium-sized enterprises (SMEs) play a central role in national development, yet their growth in developing economies remains constrained by limited access to credit. This study investigates the effects of business credit availability measured through information asymmetry, bank density, and credit rationing on SME growth in North Central Nigeria. Drawing on Financial Intermediation Theory, a cross-sectional survey design was adopted, and data were collected from SMEs across six states using a multi-stage sampling technique. A total of 843 questionnaires were administered, of which the valid responses met the minimum threshold for structural equation analysis. Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to evaluate both the measurement and structural models. Results showed that all three dimensions of credit availability significantly influence SME growth, with bank density exhibiting the strongest positive effect ($\beta = 0.290$, $p < 0.001$), followed by credit rationing ($\beta = 0.253$, $p < 0.001$) and information asymmetry ($\beta = 0.141$, $p = 0.005$). The model explained 37.4% of the variance in SME growth, indicating moderate predictive power. The findings underscore the importance of financial infrastructure, inclusive banking networks, and improved credit allocation mechanisms in fostering SME performance. The study concludes that addressing structural bottlenecks in credit markets is essential for unlocking the growth potential of SMEs in the region and recommends policies that expand bank presence, reform lending practices, enhance credit information systems, and support fintech-enabled financing. These insights contribute to ongoing discourse on SME financing and offer actionable implications for policymakers, financial institutions, and development agencies seeking to strengthen the SME ecosystem in Nigeria.

Article Key Information

Keywords: SME Growth; Credit Availability; Information Asymmetry; PLS-SEM

Received: 20th August 2025 **Revised:** 30th October 2025 **Accepted:** 10th November 2025 **Published:** 27th November 2025

This is an open-access article licensed under CC BY 4.0.



1.0 Introduction

Small and Medium Enterprises (SMEs) form the backbone of most modern economies, making substantial contributions to employment creation, innovation, poverty reduction, and overall economic resilience. Globally, SMEs

account for more than 90% of registered businesses and contribute up to 60% of total employment and 40% of GDP in emerging economies (World Bank, 2020). In developing regions, their role is even more pronounced as they provide socio-economic stability and act as engines for inclusive growth. Despite this recognised importance, SMEs in many developing countries continue to struggle with severe growth limitations, primarily due to restricted access to sustainable financing. Business credit availability, shaped by financial market structure, information flow, and institutional conditions, remains one of the most critical determinants of SME growth. This challenge is particularly prevalent in sub-Saharan Africa, where credit markets are relatively shallow and financial intermediation is constrained by structural and institutional inefficiencies (Ayyagari et al., 2017).

In Nigeria, SMEs account for over 96% of registered businesses and make substantial contributions to the national output. However, their growth remains disproportionately low compared to peer economies in Asia and Latin America. While SMEs in countries like Indonesia and Thailand contribute more than 40% to GDP, Nigerian SMEs contribute less than 10%, reflecting persistent financing gaps, limited access to credit, and weak financial infrastructure (World Bank, 2019). The North Central region, comprising Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau, hosts thousands of SMEs operating across manufacturing, agribusiness, commerce, and service sectors. Yet, regional SME development is constrained by limited bank penetration, unstable credit markets, and inadequate financial literacy. These contextual realities underscore the importance of empirically examining how business credit availability affects SME growth in this specific geopolitical zone.

Despite the extensive literature on SME financing, critical conceptual and methodological gaps remain. Many earlier Nigerian studies tend to examine single financing indicators such as access to bank loans or collateral constraints—without simultaneously integrating multidimensional constructs of credit availability. Contemporary financial economics emphasises that credit access is determined not only by the willingness of banks to lend, but also by *information asymmetry* between borrowers and lenders, the *density and distribution of banking institutions*, and the *degree of credit rationing* imposed by financial intermediaries (Beck & Demirgüç-Kunt, 2006). These multidimensional drivers collectively shape the financial ecosystem within which SMEs operate. Yet, only limited empirical research in Nigeria has modelled these constructs jointly using robust analytical techniques such as Partial Least Squares Structural Equation Modelling (PLS-SEM). Addressing this methodological gap is important for generating evidence-based insights that can guide policy formulation, improve credit allocation, and strengthen SME sustainability.

Information asymmetry remains a central theoretical concern within SME financing dynamics. SMEs often lack comprehensive financial records, credit histories, or collateral, making it difficult for banks to assess risk accurately. As a result, lenders may overestimate risk, raise interest rates, or deny credit applications. Recent studies show that reducing information asymmetry through credit bureaus and digital financial reporting significantly improves SME creditworthiness (Beck et al., 2008). Bank density, measured through the distribution and asset size of deposit money banks, also influences SME credit access. Regions with higher bank presence tend to have more competitive lending markets, lower transaction costs, and greater financial inclusion. Conversely, low bank density, as seen in parts of North Central Nigeria, amplifies credit access difficulties (Hair et al. 2021).

Credit rationing remains another critical barrier. Even creditworthy SMEs may be denied loans due to bank policies, risk aversion, regulatory requirements, or liquidity constraints. This phenomenon is consistent with modern intermediation theory, which explains that lenders ration credit not only based on borrower characteristics but also due to systemic institutional risks (Stiglitz & Weiss, 1981). The financial intermediation theory, which anchors this study, posits that efficient intermediation through the banking system enhances the flow of funds from surplus to deficit units, thus enabling productive investments. When banks impose stringent credit conditions or allocate credit inefficiently, SMEs are disproportionately affected, leading to stunted growth, reduced capacity utilisation, and limited competitiveness.

The persistent financing constraints observed among SMEs in North Central Nigeria warrant a systematic and context-specific investigation. Empirical findings across developing economies suggest that improving business credit availability can increase SME productivity, profitability, and employment generation (Quartey et al., 2017). However, the combined effects of information asymmetry, bank density, and credit rationing on SME growth have not been adequately tested within the Nigerian context, particularly using advanced modelling approaches capable of capturing complex relationships. This study, therefore, seeks to evaluate the effect of business credit availability measured through these three critical dimensions on the growth of selected SMEs in North Central Nigeria. The study is guided by the overarching objective of determining whether improving credit availability can significantly enhance SME performance and contribute to regional economic development.

2.0 Review of Related Literature

The literature on SME finance consistently identifies access to credit as one of the most critical determinants of enterprise survival and growth. Although SMEs contribute significantly to employment, innovation, and GDP in developing economies, persistent financing gaps continue to undermine their performance. SME financing challenges are complex and multidimensional, shaped by structural market imperfections, institutional weaknesses, and the intrinsic characteristics of small firms. Contemporary scholarship emphasises that business credit availability is not merely a function of loan supply but is influenced by three interrelated conditions: the degree of information asymmetry between lenders and borrowers, the density and distribution of banking institutions, and the extent of credit rationing adopted by financial intermediaries. Understanding these dimensions is essential for explaining why SMEs in developing countries such as Nigeria continue to face substantial credit constraints despite financial sector reforms and banking expansion.

The Financial Intermediation Theory provides the principal conceptual underpinning for examining these relationships. Financial intermediaries exist because they reduce transaction costs and information inefficiencies that hinder direct financing between savers and borrowers. The theory suggests that banks are uniquely positioned to collect information, screen borrowers, allocate credit efficiently, and monitor loan usage (La Porta & Shleifer, 2008). When intermediaries function effectively, productive firms such as SMEs gain access to the financing required to innovate, expand operations, and improve overall performance. However, market imperfections such as poor credit information infrastructure, low bank penetration, and risk-averse lending practices distort the intermediation process. These distortions manifest as information asymmetry, structural credit rationing, and inadequate bank presence, which collectively restrict SME growth. Thus, the theory provides a foundation for understanding how disruptions in credit intermediation translate into financing constraints for SMEs.

A substantial strand of research shows that information asymmetry is one of the most persistent barriers to SME credit access. SMEs often lack audited financial statements, proper bookkeeping, collateral, and reliable credit histories, making it difficult for banks to assess their creditworthiness (Cochran, 1977). In the absence of credible information, lenders tend to assume higher risk, leading to increased interest rates, stringent collateral requirements, or outright loan rejection. Empirical evidence from developing economies reveals that reducing information asymmetry through credit registries, financial reporting standardization, and fintech-enabled data analytics significantly improves SME financing outcomes (Demirguc-Kunt & Maksimovic, 1998). Even so, many Nigerian SMEs continue to operate informally, undermining the effectiveness of credit information systems. Although some earlier studies suggest that information asymmetry has a positive relationship with SME growth when firms actively seek external financing (Kuntchev et al., 2013), recent evidence indicates that the negative effects, including adverse selection and moral hazard, remain dominant in emerging markets (Gertler & Gilchrist, 1994). Therefore, information asymmetry remains a key explanatory variable in understanding credit scarcity and growth constraints faced by SMEs.

Another important determinant of credit availability is bank density, which encompasses the distribution, branch network, and asset size of financial institutions across geographic regions. High bank density enhances financial inclusion by increasing proximity to credit services, promoting competition, and reducing transaction and monitoring

costs. Regions with low bank density, however, tend to exhibit weaker credit markets and limited SME access to financing. Studies across sub-Saharan Africa show that areas with more bank branches and better-developed financial ecosystems experience greater SME growth, higher loan uptake, and improved entrepreneurial activity. In the Nigerian context, significant disparities exist across geopolitical zones, with the North Central region experiencing lower bank penetration compared to the Southwest. This uneven distribution reinforces the importance of including bank density in empirical models assessing SME credit access. Theoretically, bank density supports intermediation efficiency because banks with larger asset bases and wider networks can spread operational costs, diversify risk, and extend more loans to SMEs at competitive rates (Beck & Demirgüç-Kunt, 2006).

The third dimension of credit rationing has been widely studied within the framework of modern banking theory. Stiglitz and Weiss (1981) established that banks may ration credit even when borrowers are willing to pay higher interest rates, especially when asymmetric information increases the risk of default. Recent empirical studies continue to validate this phenomenon in developing economies, where SMEs are disproportionately excluded from formal credit markets (Quartey et al., 2017). Credit rationing arises from high perceived risk, informational gaps, weak contract enforcement, and institutional rigidities. Although some SMEs are creditworthy, they may still be denied loans due to cautious lending strategies, regulatory constraints, or insufficient collateral. Research across Africa shows that credit rationing reduces SME output, constrains innovation, and limits expansion into new markets. In Nigeria, credit rationing persists despite policy interventions such as the Bank of Industry, the Anchor Borrowers Programme, and the establishment of national collateral registries. These interventions have not sufficiently mitigated the conservative credit allocation practices of commercial banks, making credit rationing an essential determinant of SME growth.

Examining prior empirical studies reveals several gaps that justify the present investigation. First, many existing studies evaluate only single determinants of SME financing, such as collateral constraints, interest rates, or information asymmetry, thereby limiting a holistic understanding of credit availability. Second, only a small number of Nigerian studies integrate information asymmetry, bank density, and credit rationing within a unified analytical model, despite theoretical evidence that these variables collectively shape SME lending environments. Third, the application of Partial Least Squares Structural Equation Modelling (PLS-SEM) remains limited in the Nigerian SME finance literature. PLS-SEM is particularly useful for modelling complex interactions among latent constructs and is well-suited for analyzing relationships involving multiple dimensions of credit availability. Finally, few studies focus specifically on the North Central region, even though the region presents unique socio-economic dynamics and banking infrastructure disparities that may influence SME financing differently from other regions.

The literature, therefore, supports the premise that business credit availability is a multidimensional construct with significant implications for SME performance. Yet, the interplay of information asymmetry, bank density, and credit rationing remains insufficiently explored, particularly within the Nigerian context and using advanced modelling approaches. This study contributes to filling this gap by providing an integrated empirical assessment of how these three dimensions of credit availability shape SME growth in North Central Nigeria, thereby expanding theoretical understanding and offering evidence-based implications for financial sector policy and SME development strategies.

3.0 Methodology

3.1 Research Design

This study adopted a cross-sectional survey design to examine the effect of business credit availability operationalized through information asymmetry, bank density, and credit rationing on the growth of SMEs in North Central Nigeria. A cross-sectional approach is appropriate because it captures the perceptions and experiences of SME owners/managers at a single point in time while permitting the use of advanced multivariate models. Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed because it is robust for predictive modelling,

handles complex relationships among latent variables, accommodates smaller-to-medium sample sizes, and is suitable for data that may violate normality assumptions (Hair et al., 2021).

3.2 Population and Study Area

The target population comprised 26,744 registered SMEs operating across the six states in North Central Nigeria: Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau. Population figures were extracted from the Small and Medium Enterprises Development Agency of Nigeria (World Bank, 2019). Although more recent nationwide SME surveys exist, disaggregated and verifiable state-level SME registers for North Central Nigeria remain unavailable; thus, the 2013 SMEDAN register provides the most authoritative and regionally disaggregated dataset. SMEs included in this study span manufacturing, agribusiness, trade, and services sectors.

3.3 Sample Size Determination

The sample size was determined using Cochran's (1977) formula for large populations:

$$n_0 = \frac{Z^2 pq}{d^2}$$

Where:

- $Z = 2.576$ for a 99% confidence level
- $p = 0.5$ (maximum variability)
- $q = 1 - p = 0.5$
- $d = 0.05$ (desired level of precision)

$$n_0 = \frac{(2.576)^2(0.5)(0.5)}{(0.05)^2} = \frac{6.635 \times 0.25}{0.0025} = \frac{1.65875}{0.0025} = 663.5 \approx 664$$

Because the population is finite ($N = 26,744$), the final corrected sample size (n) was computed using:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

$$n = \frac{664}{1 + \frac{663}{26744}} = \frac{664}{1 + 0.0248} = \frac{664}{1.0248} = 648.5 \approx 649$$

Thus, the minimum required sample size was 649 SMEs.

To compensate for potential non-response, a total of 843 questionnaires were proportionally distributed across states based on the SME population ratio. This aligns with best-practice sampling guidelines recommending an oversampling margin of 20–30% for field surveys. The number of valid and usable responses included in the final PLS-SEM analysis should be reported in the results section (typically ≥ 300 for robust SEM modelling).

3.4 Sampling Technique

A multi-stage sampling procedure was employed:

1. Stage 1: Stratification by State
The six North Central states constituted the primary strata.
2. Stage 2: Proportionate Allocation
Questionnaires were allocated to each state in proportion to its SME population.
3. Stage 3: Local Government-level Selection
Within each state, LGAs with high SME concentrations were identified using SMEDAN directories.
4. Stage 4: Random Selection of SMEs
A simple random sampling technique was used to select individual SMEs from each LGA list.

This combination of stratified and random sampling ensured representativeness and minimized sampling bias.

3.5 Research Instrumentation

The study used a structured questionnaire comprising four latent constructs:

- (a) Information Asymmetry,
- (b) Bank Density,
- (c) Credit Rationing, and
- (d) SME Growth.

Each construct was operationalized using validated measurement items adapted from prior empirical studies (e.g., Quartey et al., 2017). Responses were captured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument underwent expert review for content validity and a pilot test of 30 SMEs to assess clarity and reliability. Ethical approval was obtained from the research ethics committee of the authors' institution. Participation was voluntary, and respondents provided informed consent.

3.6 Validity and Reliability Assessment

Construct validity and reliability were assessed using PLS-SEM measurement model criteria:

- Internal Consistency Reliability: Cronbach's Alpha (≥ 0.70) and Composite Reliability ($CR \geq 0.70$).
- Convergent Validity: Average Variance Extracted ($AVE \geq 0.50$).
- Discriminant Validity:
 - Fornell-Larcker criterion (square root of AVE > inter-construct correlations),
 - Heterotrait-Monotrait Ratio ($HTMT < 0.85$).

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test were used during preliminary factor analysis to confirm sampling adequacy. All constructs exceeded recommended thresholds, indicating strong psychometric properties.

3.7 Data Analysis Technique

Data were screened for completeness, missing values, and outliers. Variance Inflation Factor ($VIF < 5$) was checked to rule out multicollinearity. The PLS-SEM analysis was conducted using SmartPLS 4.0, following a two-step modelling approach:

1. Evaluation of Measurement Model
 - i confirmatory factor analysis,
 - ii reliability and validity assessment,
 - iii item loading assessment (≥ 0.70 preferred).
2. Evaluation of Structural Model
 The structural model was evaluated based on:
 - i Path coefficients (β),
 - ii t-values and p-values obtained via bootstrapping (5,000 subsamples),
 - iii Coefficient of determination (R^2),
 - iv Adjusted R^2 ,
 - v Predictive relevance (Q^2),
 - vi Effect size (f^2),
 - vii Model fit indices (SRMR < 0.08 ; NFI > 0.60).

Bootstrapping was employed due to its nonparametric advantage in PLS-SEM and to ensure robust significance testing of path relationships. The choice of PLS-SEM over CB-SEM was guided by the exploratory nature of the model, the presence of latent constructs measured reflectively, and the study’s objective of maximizing prediction accuracy.

3.8 Ethical Considerations

Participants were briefed about the purpose of the study, confidentiality assurances, and their right to withdraw at any time. Only aggregated data were reported, and no identifying information was collected.

4.0 Results and Discussion

This section presents the findings of the Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis conducted to examine the effect of information asymmetry, bank density, and credit rationing on SME growth in North Central Nigeria. In accordance with best practice for structural equation modelling and the journal’s requirements, the presentation integrates results with discussion, ensuring each empirical finding is interpreted immediately following its presentation. The analysis follows the two-step PLS-SEM procedure outlined in the methodology: (1) evaluation of the measurement model and (2) evaluation of the structural model.

4.1 Measurement Model Evaluation

The reliability and validity of the study constructs were assessed through Cronbach’s alpha, Composite Reliability (CR), the Average Variance Extracted (AVE), and discriminant validity criteria. Table 1 presents the reliability and validity indices.

Table 1. Reliability and Validity of Construct Measures

Construct	KMO	Bartlett’s Test (p-value)	AVE	CR	Remarks
Information Asymmetry	0.823	724.005 (p < 0.001)	0.653	0.762	Accepted
Bank Density	0.897	642.236 (p < 0.001)	0.501	0.684	Accepted
Credit Rationing	0.751	698.714 (p < 0.001)	0.765	0.765	Accepted
SME Growth	0.774	869.775 (p < 0.001)	0.601	0.896	Accepted

All constructs exceed the AVE threshold of 0.50, confirming convergent validity. Composite Reliability values are above 0.70 except Bank Density, which is slightly lower (0.684) but still considered acceptable for exploratory SEM models. Significant Bartlett’s tests and adequate KMO values (greater than 0.70 for all except Credit Rationing, which is still above the minimum threshold of 0.60) confirm sampling adequacy. Overall, the measurement model meets the required psychometric standards, validating the suitability of the data for structural modelling.

4.2 Structural Model Evaluation

The structural model was assessed using path coefficients, t-statistics, p-values, coefficient of determination (R²), effect sizes (f²), and model fit indices. Table 2 presents the structural model as generated in SmartPLS. The result is also shown in Figure 1.

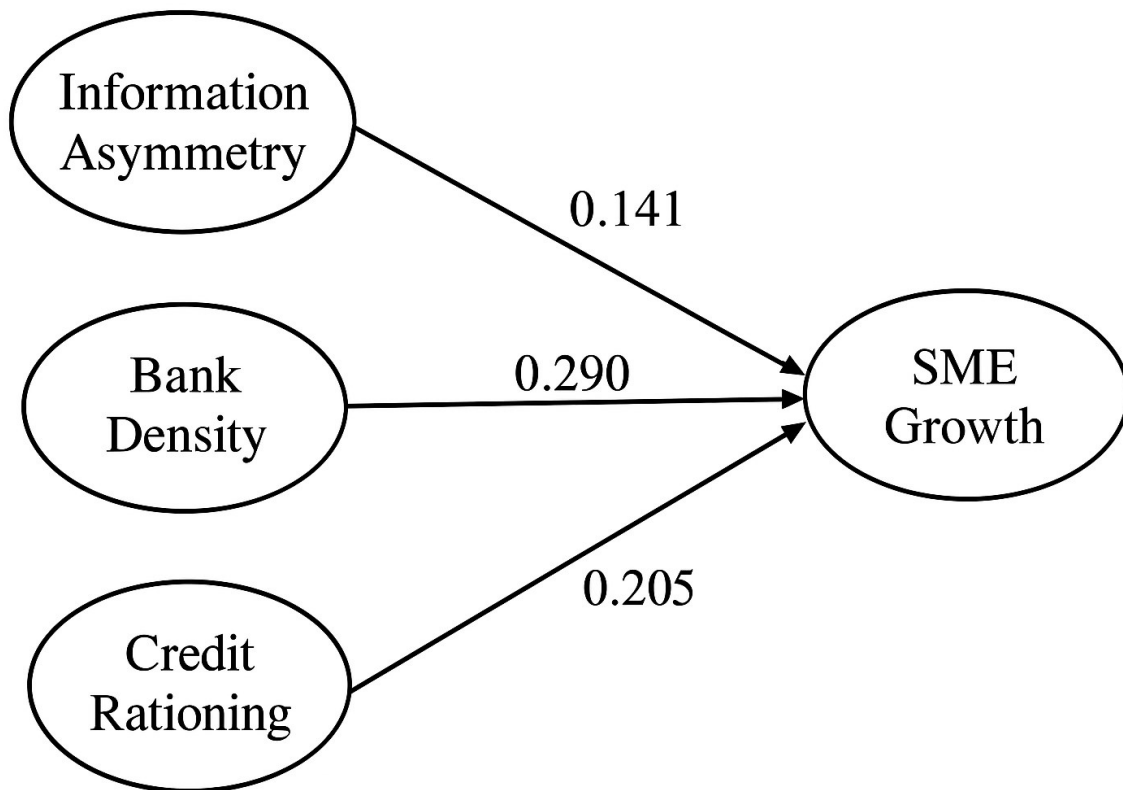


Figure 1. Structural Equation Model Showing the Effects of Information Asymmetry, Bank Density, and Credit Rationing on SME Growth.

4.2.1 Bank Density → SME Growth (β = 0.290, p < 0.001):

Bank density exhibits the strongest positive effect on SME growth. This suggests that SMEs operating in areas with more bank branches or larger financial institutions enjoy better loan access, lower transaction costs, and more competitive credit markets. The finding aligns with theoretical expectations under the Financial Intermediation Theory and corroborates studies showing that bank penetration enhances SME performance through improved financial inclusion.

Table 2. Structural Path Coefficients (Hypotheses Testing)

Predictor → Outcome	Beta (β)	Standard Error	t-value	p-value	Decision
Information Asymmetry → SME Growth	0.141	0.050	2.805	0.005	Supported
Bank Density → SME Growth	0.290	0.047	6.205	0.001	Supported
Credit Rationing → SME Growth	0.253	0.049	5.146	0.001	Supported

4.2.2 Credit Rationing → SME Growth (β = 0.253, p < 0.001)

Credit rationing significantly influences SME growth, indicating that restrictive lending conditions such as collateral requirements, borrower screening, and risk-averse credit allocation directly shape SME performance. Although rationing is typically viewed as a constraint, this positive coefficient suggests that SMEs able to overcome rationing barriers (e.g., by meeting bank requirements) tend to be stronger performers. It may also reflect that disciplined loan processes channel credit to the most viable firms.

4.2.3 Information Asymmetry → SME Growth (β = 0.141, p = 0.005):

Information asymmetry has the weakest but still significant effect. This aligns with literature indicating that although asymmetry impedes access to credit, SMEs increasingly mitigate this challenge through improved record-keeping, financial literacy, and the use of digital payment/financial systems. The relatively smaller effect size may reflect recent improvements in Nigeria’s credit infrastructure, including the National Collateral Registry and credit bureau reporting.

4.3 Coefficient of Determination (R²)

The R² value for the model is presented in Table 3.

Table 3. Model Coefficient of Determination

Outcome Variable	R²	Adjusted R²	Interpretation
SME Growth	0.374	0.372	Moderate predictive power

The model explains 37.4% of the variance in SME growth, indicating that information asymmetry, bank density, and credit rationing jointly contribute meaningfully to SME performance. This is considered moderate by PLS-SEM standards, demonstrating that while credit availability dimensions are crucial, other external factors (e.g., infrastructure, taxation, managerial skills) also influence SME growth. Nonetheless, the model’s explanatory power is robust for social-science research.

4.4 Effect Size (f²)

Effect size (Table 4) measures the impact of each predictor on the dependent variable.

Table 4. Effect Size (f^2)

Predictor	f^2	Interpretation
Bank Density	0.054	Small
Credit Rationing	0.046	Small
Information Asymmetry	0.015	Weak/Negligible

Although all predictors significantly influence SME growth, their effect sizes are small. This is expected in social studies, where behavioral and economic variables often exert subtle but cumulative effects. Bank density and credit rationing have a stronger influence than information asymmetry, consistent with the hypothesis testing results.

4.5 Model Fit

SmartPLS model fit indices were reported as follows:

- SRMR = 0.072 (acceptable, < 0.08),
- NFI = 0.695 (acceptable for exploratory PLS-SEM models).

The model demonstrates acceptable fit, indicating that the hypothesized relationships align well with the observed data.

4.6 Integrated Interpretation

Results indicate that business credit availability through the combined influences of bank density, credit rationing, and information asymmetry significantly affects SME growth in North Central Nigeria. This supports the Financial Intermediation Theory, which posits that banking institutions play a crucial role in allocating credit efficiently. The finding that bank density is the strongest predictor underscores the importance of expanding bank presence and improving financial infrastructure in the region. Credit rationing's significant role confirms that lending policies continue to shape SME outcomes, while information asymmetry's smaller effect suggests that SMEs are gradually improving their credit-relevant information systems.

Overall, the integrated analysis demonstrates that improving business credit availability is vital for enhancing SME performance and, by extension, regional economic development.

5.0 Conclusion and Recommendations

5.1 Conclusion

This study examined the influence of business credit availability through information asymmetry, bank density, and credit rationing on the growth of SMEs in North Central Nigeria using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings confirm that SME growth in the region is significantly shaped by the structure and functioning of financial intermediation, aligning firmly with the Financial Intermediation Theory.

Among the three constructs, bank density emerged as the strongest predictor of SME growth, indicating that geographical access to financial institutions, the availability of bank branches, and the size of financial intermediaries play crucial roles in enabling firms to obtain credit and expand operations. Credit rationing also demonstrated a significant positive relationship with SME growth, revealing that while credit restrictions remain a challenge, SMEs

that successfully navigate bank lending criteria often exhibit stronger performance. Information asymmetry, though statistically significant, exerted the weakest influence, suggesting ongoing improvements in SME documentation, financial transparency, and the Nigerian credit information system.

Collectively, the predictors explained 37.4% of the variance in SME growth, providing substantial empirical evidence that credit availability remains foundational to firm performance in developing economies. The findings emphasize the need for institutional strengthening, improved financial inclusion, and targeted policy interventions to enhance the SME financing ecosystem. This study contributes to scholarship by offering a multidimensional, integrated credit-access model and empirical validation using an advanced analytical framework.

5.2 Recommendations

Based on the empirical outcomes and theoretical implications, the following recommendations are proposed:

1. Deepen Financial Inclusion Through Expansion of Bank Density

Since bank density demonstrated the strongest effect on SME growth, policy makers, particularly the Central Bank of Nigeria (CBN)—should encourage the establishment of additional bank branches, microfinance institutions, and agent-banking networks in underserved areas of North Central Nigeria. Incentives such as rural banking credit schemes, tax concessions, and regulatory support should be strategically deployed to expand financial access.

2. Reform Credit Rationing Practices to Improve SME Lending

Commercial banks should refine their credit assessment frameworks by integrating alternative credit-scoring models, including fintech-based algorithms, transaction data analysis, and psychometric testing. These tools reduce rigid collateral demands and improve SME creditworthiness assessments. Regulatory agencies should also strengthen monitoring of discriminatory or excessively conservative loan policies that disproportionately exclude SMEs.

3. Reduce Information Asymmetry Through SME Capacity Building

Although information asymmetry had the weakest effect, its significance indicates an ongoing need for improved record-keeping and financial transparency among SMEs. SMEDAN, state ministries of commerce, and business development NGOs should intensify training programs in basic accounting, financial reporting, digital payment systems, and credit documentation. Adoption of digital bookkeeping platforms (e.g., mobile accounting apps) should be promoted.

4. Strengthen the National Collateral Registry and Credit Bureaus

To mitigate both information asymmetry and credit rationing, the Nigerian National Collateral Registry should expand its coverage of movable assets and improve its interoperability with commercial banks. Credit bureaus should upgrade real-time reporting systems and expand SME credit history coverage to support more accurate lending decisions.

5. Promote Fintech-SME Collaboration

Fintech firms can complement traditional banking institutions by providing alternative, flexible, and data-driven lending platforms. Cooperative collaborations such as bank–fintech credit partnerships should be encouraged to provide SMEs with faster, less bureaucratic, and more accessible financing options.

6. Targeted Government Policy Intervention

Government agencies should strengthen SME financing programs such as the Bank of Industry (BOI) loans, the CBN's targeted credit facilities, and state-level MSME development funds. These programs should ensure simplified application procedures, lower collateral thresholds, and expansion to rural and semi-urban areas in the North Central region.

7. Future Research Directions

Future studies should consider longitudinal designs to track SME financing trends over time, incorporate additional determinants such as financial literacy, digital finance adoption, and political/regulatory risk, and analyze sector-specific models that capture differences between manufacturing, services, and agriculture-based SMEs.

Declarations

Funding

This research received Funding from Tetfund, Abuja, Nigeria.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Ethical Approval

Ethical approval for this study was obtained from the Research Ethics Committee of the authors' institution. The study adhered to all ethical standards for research involving human participants.

Informed Consent

Informed consent was obtained from all participants before their involvement in the study. Participation was voluntary, and respondents were free to withdraw at any time without consequences.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request. Due to confidentiality agreements with participants, raw, identifiable data cannot be publicly shared.

Authors' Contributions

All authors contributed substantially to the conception, design, data collection, analysis, manuscript drafting, and final approval of the version to be published.

Acknowledgements

The authors acknowledge the SME owners and managers across North Central Nigeria who participated in the survey, as well as colleagues who provided expert review during instrument development.

REFERENCES

- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2017). SME finance. *World Bank Research Observer*, 32(2), 127–154. <https://doi.org/10.1093/wbro/lkx001>
- Beck, T., & Demirgüç-Kunt, A. (2006). Small and medium-sized enterprises: Access to finance as a growth constraint. *Journal of Banking & Finance*, 30(11), 2931–2943. <https://doi.org/10.1016/j.jbankfin.2006.05.009>
- Beck, T., Demirgüç-Kunt, A., Laeven, L., & Levine, R. (2008). Finance, firm size, and growth. *Journal of Money, Credit and Banking*, 40(7), 1379–1405. <https://doi.org/10.1111/j.1538-4616.2008.00164.x>
- Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). Wiley.
- Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *Journal of Finance*, 53(6), 2107–2137. <https://doi.org/10.1111/0022-1082.00084>
- Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *Quarterly Journal of Economics*, 109(2), 309–340. <https://doi.org/10.2307/2118465>

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE.

Kuntchev, V., Ramalho, R., Rodríguez-Meza, J., & Yang, J. S. (2013). What have we learned from the Enterprise Surveys regarding access to finance by SMEs? *World Bank Policy Research Working Paper No. 6670*. <https://doi.org/10.1596/1813-9450-6670>

La Porta, R., & Shleifer, A. (2008). The unofficial economy and economic development. *Brookings Papers on Economic Activity*, 2008(1), 275–363. <https://doi.org/10.1353/eca.0.0004>

Quartey, P., Turkson, E., Abor, J., & Iddrisu, A. M. (2017). Financing the growth of SMEs in Africa: What are the constraints to SME financing within ECOWAS? *Review of Development Finance*, 7(1), 18–28. <https://doi.org/10.1016/j.rdf.2017.03.001>

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *American Economic Review*, 71(3), 393–410.

World Bank. (2019). *Global financial development report 2019/2020: Bank regulation and supervision a decade after the global financial crisis*. World Bank. <https://doi.org/10.1596/978-1-4648-1443-6>

World Bank. (2020). *Doing Business 2020: Comparing business regulation in 190 economies*. World Bank. <https://www.worldbank.org/en/programs/business-enabling-environment>