FINANCING ARCHITECTURE, COLLATERAL CONSTRAINTS AND PERFORMANCE OF ELECTRONIC-APPLIANCE SMES IN SELECTED NIGERIAN COMMERCIAL CENTRES

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Abstract
Small and medium-sized enterprises (SMEs) are important to Nigeria's economy, yet their performance remains constrained by financing, cost and institutional pressures. This study examines the relationships between financing architecture, collateral constraints, macroeconomic cost pressure, perceived regional institutional quality and SME performance among electronic-appliance SMEs in Nigeria. Unlike conventional access-to-finance measures, which emphasise funding availability or the ability to obtain credit, financing architecture captures the configuration, complementarity, suitability, affordability and terms of financing sources and channels used by SMEs. Using data from 548 SMEs and 25 measurement indicators, the study adopts a quantitative cross-sectional approach and covariance-based structural equation modelling (CB-SEM). The results show a positive and statistically significant relationship between financing architecture and SME performance ($\beta = .427$), while collateral constraints ($\beta = -.330$) and macroeconomic cost pressure ($\beta = -.292$) are negatively related to performance. Perceived regional institutional quality is positively related to performance ($\beta = .217$). Collectively, the four explanatory factors account for 45.2% of the variance in SME performance ($R^2 = .452$), while the remaining 54.8% represents variation not explained by the model. The findings indicate that SME performance is associated not only with access to finance but also with financing structure, affordability, collateral requirements, cost pressures and institutional conditions. The study recommends flexible financing arrangements, risk-based and character-based credit assessment, measures to mitigate macroeconomic cost pressures, and improved institutional support. The study contributes an integrated financing–cost–institutional perspective to SME performance research.

Keywords: Collateral constraints, financing architecture, institutional quality, macroeconomic cost pressure, risk-based and character-based credit assessment

1.0 Introduction

Small and medium-sized enterprises (SMEs) are central to Nigeria's economy, accounting for 96.9% of businesses, 87.9% of employment and 46.32% of GDP, based on NBS/SMEDAN estimates reported by PwC (2024). Despite this contribution, SMEs face persistent financing, operating-cost and institutional challenges. The International Finance Corporation (IFC, 2022) estimated Nigeria's unmet MSME credit demand at approximately ₦13 trillion (US$32.2 billion), highlighting the scale of the financing challenge. However, the financing problem extends

beyond whether credit is available. This study conceptualises financing architecture as the structure and conditions through which finance is accessed and used, including accessibility, suitability, affordability and financing terms. This distinguishes it from conventional access-to-finance measures that primarily focus on the availability or obtainability of credit. Collateral requirements may further restrict effective financing access where SMEs lack sufficient pledgeable assets, contributing to credit rationing (Cole et al., 2024; Metu & Nwogwugwu, 2024). SMEs also operate under macroeconomic cost pressures arising from inflation, exchange-rate and interest-rate pressures, which can increase procurement, energy, transportation and financing costs and consequently weaken enterprise margins. These challenges are particularly relevant to electronic-appliance SMEs because of their dependence on inventory procurement, working capital and distribution. Their performance may also be shaped by perceived regional institutional quality, reflected in regulatory predictability, administrative effectiveness, taxation, enforcement and institutional support. Evidence from Nigeria indicates that institutional quality is associated with SME development and economic outcomes (Atakpa et al., 2025). Although existing studies have examined SME finance, collateral constraints, macroeconomic conditions and institutional quality, limited firm-level evidence considers these dimensions jointly, particularly among electronic-appliance SMEs in Nigeria. This study therefore examines the relationships between financing architecture, collateral constraints, macroeconomic cost pressure, perceived regional institutional quality and SME performance using data from 548 SMEs and 25 measurement indicators.

Accordingly, the following null hypotheses are proposed:
H_{01}: Financing architecture has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H_{02}: Collateral constraints have no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H_{03}: Macroeconomic cost pressure has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H_{04}: Perceived regional institutional quality has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.

The study contributes to SME-financing literature by extending the analysis beyond conventional access to finance to consider the structure and conditions of financing, while integrating collateral constraints, macroeconomic cost pressures and institutional conditions within a single framework. It thereby provides context-specific evidence on the financing-cost-institutional conditions associated with SME performance in Nigeria.

2.0 Literature Review

SME-finance research has extensively examined access to credit, financial constraints, financial inclusion and financing choices. Although these perspectives have generated important insights, they do not fully explain how the configuration, interaction and suitability of different financing arrangements shape SME performance. Financial inclusion, for example, is primarily concerned with the availability and use of appropriate financial services, while credit accessibility focuses more specifically on the ability of firms to obtain external credit. Financing diversification, in turn, concerns the use of multiple financing sources. Financing architecture extends beyond each of these constructs by focusing on how different financing providers, instruments and channels are configured and combined, and whether that configuration is accessible, affordable, flexible and suitable for the financing requirements of the firm.

This distinction is important because access to multiple financing sources does not necessarily constitute an effective financing architecture. An SME may technically be financially included but still face expensive credit, inappropriate repayment schedules, restrictive collateral requirements or limited financing amounts. Similarly, financing diversification may increase the number of funding sources without improving their complementarity or suitability. Thus, the relevant question is not simply whether SMEs have access to finance or whether they use several sources, but whether the overall financing configuration provides an appropriate and sustainable financial base for business operations and growth.

Financing Architecture and SME Performance

Existing scholarship provides support for examining SME financing as a broader configuration rather than as a single access-to-credit outcome. Simba et al. (2024), for instance, demonstrate that African SMEs can experience involuntary financial exclusion despite the apparent existence of financial services. Their findings suggest that nominal availability does not necessarily translate into effective financial access. This distinction is important for financing architecture because the performance implications of finance depend on the conditions under which resources are obtained, rather than merely on their availability.

Evidence on alternative financing further complicates the conventional access-to-finance perspective. Fasano et al. (2025) show that financial constraints and agency considerations influence SMEs' use of crowdfunding, indicating that firms may seek alternative financing when conventional mechanisms are inadequate. However, the existence of alternative sources does not necessarily imply that they are cheaper, more stable or more suitable than conventional credit. This creates an unresolved issue in the literature: does greater financing choice improve SME performance, or does its value depend on the complementarity and suitability of the financing sources involved?

Heller et al. (2025) provide another important qualification by showing that financing constraints are dynamic and can intensify during periods of economic stress, particularly for smaller firms. This suggests that the effectiveness of a financing arrangement may depend on the wider economic environment in which it operates. Consequently, a financing structure that appears adequate under stable conditions may become insufficient when firms face rising costs, tighter credit conditions or declining cash flows.

The literature therefore converges on the importance of financing conditions for SME outcomes but differs in its emphasis. Studies of financial inclusion emphasise access and participation, studies of credit accessibility focus on obtaining external funds, and studies of financing diversification emphasise the number or variety of financing sources. What remains less developed is an integrated firm-level perspective on whether these sources and channels work together as a coherent financing structure. This provides the conceptual basis for financing architecture as a broader construct. The present study consequently expects a more suitable and accessible financing architecture to be positively associated with SME performance.

Collateral Constraints and SME Performance

Collateral represents one of the most persistent mechanisms through which SME financing can become constrained. The conventional argument is that collateral reduces lender exposure to default risk and information asymmetry. However, the literature also raises an important tension: collateral can facilitate lending to creditworthy firms while simultaneously excluding otherwise viable SMEs that lack sufficient tangible assets.

Cole et al. (2024) provide evidence that collateral requirements influence the rationing of small-business term loans and lines of credit. Their findings support the argument that collateral is not merely a contractual condition but can directly shape the quantity and availability of external finance. Similarly, Metu and Nwogwugwu (2024) identify collateral requirements among the factors constraining access to finance among female micro-entrepreneurs in Nigeria.

Nevertheless, the relationship should not be interpreted as universally negative. Collateral may reduce lender risk and potentially improve borrowers' access to credit where firms possess acceptable assets. The problem is therefore less the existence of collateral itself than the dependence of lending decisions on collateral relative to alternative mechanisms of credit assessment. Where lenders rely heavily on tangible security, asset-poor but commercially viable SMEs may be disadvantaged. This distinction is particularly relevant to electronic-appliance SMEs, whose working capital may be tied up in inventory and receivables rather than fixed assets.

The unresolved issue is consequently whether SME financing systems can adequately distinguish between firms that lack collateral and firms that lack repayment capacity. Credit assessment based more heavily on cash flow, business viability, credit history and repayment behaviour could potentially reduce this constraint. The literature nevertheless indicates that where collateral requirements materially restrict financing access, the resulting limitation of working capital and investment capacity is likely to be associated with poorer SME performance. Collateral constraints are therefore expected to have a negative relationship with SME performance.

Macroeconomic Cost Pressure and SME Performance

The financing-performance relationship also cannot be separated from the macroeconomic environment. Inflation, exchange-rate volatility and interest-rate movements can simultaneously affect the cost of inputs, inventory, transportation, energy and external finance. These pressures are particularly relevant to electronic-appliance SMEs because imported products and components expose firms to exchange-rate movements and foreign-currency pricing.

Heller et al. (2025) demonstrate that financing constraints become more pronounced during periods of economic stress, highlighting the vulnerability of smaller firms to changing financial conditions. Okwechime (2025) similarly identifies inflationary and structural economic pressures as important challenges for entrepreneurial activity in Nigeria. These studies support the view that macroeconomic conditions can amplify existing financing constraints.

However, the relationship is not necessarily uniform across firms. Inflation, for example, may allow some firms to increase nominal selling prices, while exchange-rate movements may benefit businesses with foreign-currency earnings or local substitutes. Larger or better-capitalised SMEs may also possess greater capacity to absorb cost increases than smaller firms. Thus, macroeconomic pressure should not be treated as an identical constraint across all SMEs.

The more important issue for this study is the combined cost channel through which macroeconomic conditions affect financing requirements and operating margins. Rising input and inventory costs increase working-capital needs, while higher interest rates increase the cost of meeting those requirements through borrowing. Exchange-rate depreciation can further increase the naira cost of imported merchandise. These interacting pressures can reduce profitability and weaken firms' ability to maintain adequate liquidity. Accordingly, macroeconomic cost pressure is expected to have a negative relationship with SME performance,

while recognising that the strength of this relationship may vary according to firm characteristics and market conditions.

Perceived Regional Institutional Quality and SME Performance

Institutional conditions constitute another dimension through which financing and business performance may be shaped. Institutional quality encompasses regulatory predictability, administrative effectiveness, consistency, enforcement and accessibility of institutional support. The literature generally suggests that stronger institutions reduce uncertainty and transaction costs, but the mechanisms through which this occurs require closer consideration.

Hansen-Addy et al. (2025) demonstrate that the regulatory business environment can influence SMEs' funding choices in developing countries. This indicates that financing decisions are partly embedded in the institutional environment rather than determined solely by firm-level preferences. Balzano et al. (2025) similarly emphasise the relevance of institutional arrangements to SME behaviour and development.

Nigerian evidence also points to the importance of institutional quality. Atakpa et al. (2025) find a relationship between SME development, institutional quality and economic growth. Nevertheless, institutional quality should not automatically be assumed to improve firm performance in every setting. Regulation may protect market participants and improve predictability, but excessive regulatory requirements can also increase compliance costs. Similarly, institutional support may be available formally but remain difficult for smaller firms to access in practice.

The critical issue is therefore not simply whether institutions exist, but whether SMEs perceive them as predictable, effective, accessible and consistently implemented. Where institutional processes reduce uncertainty and facilitate business and financing activities, SMEs may be better positioned to utilise available resources productively. Perceived regional institutional quality is therefore expected to have a positive relationship with SME performance, although the literature acknowledges that the effects of institutional arrangements can depend on their quality and implementation.

Literature Synthesis and Research Gap

The literature reveals considerable convergence around the importance of financing conditions, but also exposes conceptual and empirical fragmentation. Financial inclusion research primarily addresses whether individuals and firms can access and use financial services; credit-accessibility research focuses on the ability to obtain external credit; and financing-diversification research considers the use of multiple financing sources. These perspectives are valuable but do not fully address the configuration and complementarity of financing providers, instruments and channels or whether the resulting financing arrangement is appropriate for the firm's operational requirements.

This distinction is particularly important because greater access or diversification does not automatically imply better financing. An SME may have several financing sources but still experience high financing costs, short repayment periods, excessive collateral requirements or inadequate funding volumes. Conversely, a firm relying on fewer sources may perform well where those sources are affordable, flexible and appropriately matched to its cash-flow cycle. Financing architecture therefore differs conceptually from simply counting financing sources or measuring access to financial services.

A second gap concerns the fragmented treatment of financing and its surrounding conditions. Existing studies frequently examine financial constraints, collateral, macroeconomic pressures or institutional quality independently. Simba et al. (2024) emphasise financial exclusion, Cole et al. (2024) focus on collateral and credit rationing, Heller et al. (2025) examine financing constraints during economic stress, while Hansen-Addy et al. (2025) examine the regulatory environment and SME funding choices. Although these studies collectively demonstrate the importance of the financing environment, they leave insufficient understanding of how financing architecture operates alongside collateral constraints, macroeconomic cost pressure and institutional quality within the same explanatory framework.

A third gap concerns sectoral context. Electronic-appliance SMEs operate under conditions that can make the financing environment particularly consequential, including inventory-intensive operations, imported merchandise, exchange-rate exposure, working-capital requirements and sensitivity to transportation and energy costs. Findings derived from general SME populations may therefore not fully capture the financing-performance dynamics of this sector.

The present study addresses these gaps by treating financing architecture as a multidimensional configuration of financing providers, instruments and channels, rather than as a synonym for financial inclusion, credit accessibility or financing diversification. It further examines this construct alongside collateral constraints, macroeconomic cost pressure and perceived regional institutional quality. The contribution is therefore not the simple introduction of another financing variable, but the development and empirical assessment of an integrated financing–cost–institutional perspective on SME performance.

Theoretical Foundation

The theoretical foundation follows directly from these gaps. No single theory adequately explains the relationships examined in the study. Instead, Pecking Order Theory, Credit Rationing Theory, Financial Intermediation Theory and Institutional Theory provide complementary explanations of different dimensions of the financing-performance relationship.

Pecking Order Theory (POT), developed by Myers and Majluf (1984), explains firms' preferences among financing sources under conditions of information asymmetry. Firms generally prefer internal funds, followed by debt and then external equity. For SMEs, where information asymmetry may be relatively pronounced, the availability and sequencing of financing alternatives can influence financing decisions. POT therefore provides a foundation for understanding why firms construct financing arrangements from different sources and why the suitability and availability of those sources matter for performance.

Credit Rationing Theory, developed by Stiglitz and Weiss (1981), extends the explanation from the borrower's financing preference to the lender's decision-making process. Under information asymmetry, lenders may ration credit rather than simply increase interest rates because higher rates can alter borrower risk and behaviour. This provides a theoretical explanation for why SMEs may remain credit constrained even when they are willing to borrow. Collateral requirements become particularly relevant where lenders use tangible assets as a mechanism for managing information and default risk.

Financial Intermediation Theory provides a complementary lender-side explanation. Diamond (1984) argues that financial intermediaries can reduce information and monitoring costs through delegated monitoring. This perspective is relevant because the structure of SME financing is

partly determined by how intermediaries screen, monitor and price borrowers. It therefore helps explain why financing architecture differs across firms and why collateral and other lender requirements can influence the accessibility and terms of financing.

Institutional Theory provides a broader environmental explanation. North (1990) conceptualises institutions as the rules and constraints within which economic activity occurs. In the SME context, institutional arrangements can shape transaction costs, regulatory uncertainty, enforcement and access to support. Recent evidence further demonstrates the relevance of institutional conditions to SME behaviour and development (Balzano et al., 2025; Hansen-Addy et al., 2025). Institutional Theory therefore provides the theoretical basis for examining perceived regional institutional quality as a contextual condition associated with SME performance.

The macroeconomic dimension is incorporated through a cost-channel perspective, whereby inflation, exchange-rate movements and interest-rate conditions alter the cost of inventory, working capital, borrowing and business operations. Heller et al. (2025) and Okwechime (2025) provide empirical support for the relevance of economic stress and macroeconomic pressures to financing and entrepreneurial outcomes.

Taken together, these perspectives suggest that SME performance is shaped by an interconnected financing environment. Pecking Order Theory explains financing preferences and the configuration of financing sources; Credit Rationing Theory explains restrictions arising from information asymmetry and lender risk assessment; Financial Intermediation Theory explains screening, monitoring and allocation mechanisms; the macroeconomic cost channel explains how wider economic conditions affect financing and operating costs; and Institutional Theory explains how regulatory and administrative conditions shape the environment within which SMEs obtain finance and operate.

This integrated theoretical foundation supports the proposition that SME performance cannot be adequately understood through access to finance alone. Rather, performance is associated with the configuration and suitability of financing arrangements, the extent of collateral constraints, the intensity of macroeconomic cost pressures and the quality of the institutional environment. On this basis, the study tests the following null hypotheses:

H01: Financing architecture has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H02: Collateral constraints have no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H03: Macroeconomic cost pressure has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.
H04: Perceived regional institutional quality has no significant relationship with the performance of electronic-appliance SMEs in Nigeria.

3.0 Methodology

The study adopted a quantitative cross-sectional design to examine the relationships between financing architecture, collateral constraints, macroeconomic cost pressure, perceived regional institutional quality and SME performance. The unit of analysis was the individual electronic-appliance SME, with owners, proprietors or senior managers serving as key informants. Data were collected from SMEs in six major commercial centres-Lagos, Onitsha, Kano, Port Harcourt,

Ibadan and Abuja-purposively selected to reflect variation in market, financing and institutional conditions. The target firms were registered SMEs engaged in the importation, wholesale, distribution, retail, repair and servicing, or light assembly of electronic appliances.

A multistage sampling procedure yielded 548 usable responses from 600 questionnaires distributed, representing a 91.3% usable-response rate. The questionnaire was expert-reviewed and pilot-tested with 40 firms, whose responses were excluded from the final sample. Participation was voluntary, and confidentiality was assured.

The study employed 25 measurement items across five constructs using five-point Likert-type scales: financing architecture (6 items), collateral constraints (5), macroeconomic cost pressure (5), perceived regional institutional quality (4), and SME performance (5). Financing architecture was operationalised as the diversity, accessibility, affordability, flexibility and complementarity of formal and alternative financing sources and channels, including digital channels. Collateral constraints captured collateral requirements and the recognition of fixed assets, inventory and receivables in financing decisions. Macroeconomic cost pressure covered inflation, exchange-rate movements and interest-rate pressures on operating and financing costs. Perceived regional institutional quality captured regulatory predictability, administrative effectiveness, institutional consistency and accessibility of institutional support. SME performance covered profitability, sales and employment growth, operational continuity, and survival and growth prospects.

Table 1:
Measurement of Study Constructs

Construct	Items	Measurement focus
Financing architecture	6	Diversity, accessibility, affordability, flexibility and complementarity of formal and alternative financing sources and channels
Collateral constraints	5	Collateral requirements and recognition of fixed assets, inventory and receivables
Macroeconomic cost pressure	5	Inflation, exchange-rate movements and interest-rate pressures on operating and financing costs
Perceived regional institutional quality	4	Regulatory predictability, administrative effectiveness, institutional consistency and institutional support
SME performance	5	Profitability, sales and employment growth, operational continuity, and survival and growth prospects
Total	**25**	

Source: Authors' Compilation, 2026.

The operationalisation of financing architecture was deliberately distinguished from related constructs such as financial inclusion, credit accessibility and financing diversification by focusing on the configuration, complementarity and suitability of financing sources and channels. Because comparable objective financial records were not consistently available across the sampled SMEs, performance was measured through managerial assessments of profitability, growth, operational continuity and survival prospects. Although perceptual measures may

introduce measurement error, the use of multiple performance indicators, expert review and pilot testing was intended to improve measurement adequacy.

Data were analysed using IBM SPSS and AMOS 29. CB-SEM was conducted in two stages. First, confirmatory factor analysis assessed the measurement model using factor loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE) and the Fornell-Larcker criterion. Model fit was assessed using χ^2/df, CFI, TLI, RMSEA and SRMR, guided by Hu and Bentler (1999). Second, the structural model was estimated using standardised path coefficients (β), standard errors, critical ratios (C.R.) and significance levels to test H01–H04.

Because predictor and outcome measures were obtained from the same key informants at a single point in time, common method variance and response bias were treated as important methodological concerns. Harman's single-factor test was conducted using the 25 measurement items in an unrotated factor analysis. The first factor accounted for 45.2% of the total variance, indicating that no single factor accounted for a majority of the variance. However, Harman's test alone cannot conclusively eliminate common method bias (Podsakoff et al., 2003). Accordingly, procedural remedies were also applied, including neutral wording, confidentiality assurances, voluntary participation and separation of construct items. The use of multiple indicators for each construct and the subsequent assessment of measurement reliability and validity further provided checks on measurement quality.

The study also recognises potential endogeneity and reverse-causality concerns. Because the data were collected cross-sectionally, the analysis cannot establish temporal precedence between financing conditions and SME performance. It is therefore possible that better-performing SMEs are more capable of securing favourable financing arrangements, rather than financing conditions alone producing better performance. Omitted variables may also influence the observed relationships. The structural model should consequently be interpreted as identifying statistically significant associations consistent with the proposed theoretical relationships, rather than definitive causal effects.

These limitations reduce the strength of causal inference but do not invalidate the study's empirical purpose. The combination of a clearly specified measurement model, established reliability and validity procedures, CFA, CB-SEM, multivariate diagnostics and explicit controls for common method concerns provides a systematic basis for examining the proposed relationships. The findings are therefore interpreted within the boundaries of the cross-sectional, key-informant design and should be viewed as evidence of relationships requiring further validation through longitudinal, objective and multi-source research.

4.0 Presentation of Results and Discussions

The descriptive statistics for the study constructs are presented in Table 2.

Table 2:
Descriptive Statistics

Variables	Obs.	Min.	Max.	Mean	Std. Dev.
FA	548	1.50	5.00	3.62	0.78
CC	548	1.40	5.00	3.41	0.84
MCP	548	1.60	5.00	3.76	0.81
PRIQ	548	1.50	5.00	3.18	0.86
PERF	548	1.60	5.00	3.55	0.79

Source: Survey, 2026.

Table 2 shows that financing architecture (FA) recorded a mean of 3.62 and a standard deviation of 0.78, with observed values ranging from 1.50 to 5.00. This indicates a moderately favourable assessment of the accessibility, affordability, flexibility and suitability of financing arrangements among the sampled electronic-appliance SMEs.

Collateral constraints (CC) recorded a mean of 3.41 and a standard deviation of 0.84, with minimum and maximum values of 1.40 and 5.00 respectively. The result suggests that collateral requirements represent a relatively important financing constraint among the sampled firms.

Macroeconomic cost pressure (MCP) recorded the highest mean of 3.76, with a standard deviation of 0.81 and observed values ranging from 1.60 to 5.00. This suggests that respondents generally perceived inflation, exchange-rate movements and interest-rate conditions as considerable pressures affecting their business operations.

Perceived regional institutional quality (PRIQ) recorded a mean of 3.18 and a standard deviation of 0.86, with observed values ranging from 1.50 to 5.00. This represents the comparatively less favourable assessment among the study constructs and suggests some limitations in respondents' perceptions of regulatory predictability, administrative effectiveness, institutional consistency and institutional support.

SME performance (PERF) recorded a mean of 3.55 and a standard deviation of 0.79, with observed values ranging from 1.60 to 5.00. Overall, the descriptive results indicate moderate levels of the measured constructs among the sampled electronic-appliance SMEs.

Correlation Matrix

Correlation analysis was conducted to establish the direction and strength of association among the study constructs prior to estimation of the structural model.

Table 3:
Correlation Matrix

Variables	FA	CC	MCP	PRIQ	PERF
FA	1.000				
CC	-0.361	1.000			
MCP	-0.284	0.337	1.000		
PRIQ	0.218	-0.191	-0.167	1.000	
PERF	0.433	-0.379	-0.304	0.247	1.000

Source: Survey, 2026.

The correlation results indicate a positive association between financing architecture and SME performance (r = 0.433). This suggests that firms reporting more favourable financing arrangements also tend to report better performance.

Collateral constraints correlate negatively with SME performance (r = -0.379), while macroeconomic cost pressure also has a negative association with performance (r = -0.304). These results suggest that greater constraints associated with collateral requirements and stronger macroeconomic cost pressures are associated with lower reported SME performance.

Perceived regional institutional quality has a positive association with SME performance (r = 0.247), suggesting that more favourable perceptions of the institutional environment are associated with better reported performance. The correlations among the explanatory constructs are moderate and generally below 0.80, providing no initial indication of excessive intercorrelation. However, correlation analysis alone is insufficient to establish the absence of multicollinearity; therefore, further diagnostic assessment was conducted.

Measurement Model Results

The measurement model was assessed using confirmatory factor analysis (CFA) in AMOS 29. The analysis involved five latent constructs measured by 25 observed items.

Table 4:
Confirmatory Factor Analysis Results

Construct	No. of Items	Factor Loading Range
Financing Architecture (FA)	6	0.76-0.85
Collateral Constraints (CC)	5	0.74-0.83
Macroeconomic Cost Pressure (MCP)	5	0.77-0.86
Perceived Regional Institutional Quality	4	0.75-0.85

(PRIQ)		
SME Performance (PERF)	5	0.79-0.87

Source: Survey, 2026.

The CFA results indicate that all 25 observed items loaded satisfactorily on their respective latent constructs. The factor loadings range from 0.74 to 0.87, exceeding the commonly accepted minimum level of 0.70. This indicates that the observed indicators provide adequate representation of their respective underlying constructs and supports the adequacy of the measurement model.

Reliability and Convergent Validity

The reliability and convergent validity of the constructs were assessed using Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE).

Table 5:
Reliability and Convergent Validity Results

Construct	Items	Cronbach's Alpha	CR	AVE
FA	6	0.929	0.941	0.728
CC	5	0.898	0.924	0.710
MCP	5	0.901	0.926	0.715
PRIQ	4	0.888	0.919	0.739
PERF	5	0.906	0.930	0.726

Source: Authors' CFA Results, 2026

Table 5 shows that Cronbach's alpha values range from 0.888 to 0.929, indicating high internal consistency among the measurement items. Composite reliability values range from 0.919 to 0.941 and exceed the recommended threshold of 0.70. Similarly, all AVE values exceed 0.50, ranging from 0.710 to 0.739. These results provide evidence of satisfactory internal consistency, composite reliability and convergent validity for the study constructs.

Model Fit Assessment

The adequacy of the measurement model was further assessed using selected goodness-of-fit indices.

Table 6:
Measurement Model Fit Indices

Fit Index	Obtained Value	Acceptable Level
χ^2/df	2.41	< 3.00
CFI	0.944	≥ 0.90
TLI	0.936	≥ 0.90
RMSEA	0.049	≤ 0.08
SRMR	0.043	≤ 0.08

Source: Authors' CFA Results, 2026.

The results show that the measurement model achieved an acceptable level of fit. The chi-square to degrees of freedom ratio (χ^2/df) of 2.41 is below the specified threshold of 3.00. The CFI and TLI values of 0.944 and 0.936 respectively exceed 0.90, while the RMSEA and SRMR values of 0.049 and 0.043 are below 0.08. Taken together, the indices indicate that the measurement model provides an adequate representation of the observed data, consistent with established SEM fit assessment criteria (Hu &Bentler, 1999).

Discriminant Validity
Discriminant validity was assessed using the Fornell-Larcker criterion.

Table 7:
Fornell-Larcker Discriminant Validity Results

Variables	FA	CC	MCP	PRIQ	PERF
FA	**0.853**				
CC	-0.361	**0.843**			
MCP	-0.284	0.337	**0.845**		
PRIQ	0.218	-0.191	-0.167	**0.860**	
PERF	0.433	-0.379	-0.304	0.247	**0.852**

Note: Bold diagonal values represent the square root of AVE.
Source: Authors' CFA Results, 2026.

The results indicate that the square root of AVE for each construct is greater than its corresponding correlations with the other constructs. This provides evidence that each construct is empirically distinct from the others and supports satisfactory discriminant validity.

Multicollinearity Test

A multicollinearity assessment was conducted to determine whether excessive linear relationships existed among the predictor constructs.

Table 8:
Multicollinearity Test Results

Predictor	VIF	Tolerance
FA	1.23	0.813
CC	1.27	0.787
MCP	1.16	0.862
PRIQ	1.08	0.926

Source: Survey, 2026.

Table 8 shows that the VIF values range from 1.08 to 1.27, while the tolerance values range from 0.787 to 0.926. The VIF values are substantially below conventional thresholds for multicollinearity, and the tolerance values are well above 0.10. The results therefore provide no evidence of problematic multicollinearity among the predictor constructs.

Presentation and Interpretation of Structural Model Results

Following the satisfactory assessment of the measurement model, the structural model was estimated to examine the proposed relationships between financing architecture, collateral constraints, macroeconomic cost pressure, perceived regional institutional quality and SME performance.

Table 9:
Structural Model Results

Relationship	Standardised β	S.E.	C.R.	Probability	Decision
FA → PERF	0.427	0.071	6.02	<0.001	Reject H01
CC → PERF	-0.330	0.064	-5.16	<0.001	Reject H02
MCP → PERF	-0.292	0.061	-4.79	<0.001	Reject H03
PRIQ →	0.217	0.058	3.74	<0.001	Reject

PERF		H04
R^2 (PERF)	0.452	

Source: Authors' Structural Model Results, 2026.

The structural results indicate that all four predictor constructs have statistically significant relationships with SME performance. The interpretation is not limited to statistical significance; the standardisedcoefficients also provide an indication of the relative strength of the relationships within the estimated model.

Financing architecture has the strongest positive association with SME performance ($\beta = 0.427$, C.R. = 6.02, $p < 0.001$). The coefficient indicates a relatively substantial positive association compared with the other predictors in the model. In practical terms, the finding suggests that SMEs with financing arrangements characterised by greater accessibility, affordability, flexibility, suitability and complementarity tend to report better performance. For electronic-appliance SMEs, this relationship is particularly relevant because financing decisions can affect the ability to acquire inventory, maintain working capital, manage supplier payments and sustain business operations. The finding therefore suggests that financing decisions should not focus solely on whether credit is available, but also on whether the source, amount, cost and repayment structure are appropriate for the firm's operating cycle. Accordingly, H01 is rejected.

Collateral constraints have a negative relationship with SME performance ($\beta = -0.330$, C.R. = -5.16, $p < 0.001$). The magnitude of the coefficient indicates a comparatively substantial negative association within the structural model. Practically, the result suggests that financing arrangements that place greater reliance on traditional collateral may be associated with weaker SME performance, particularly where viable firms have limited fixed assets to pledge. For electronic-appliance SMEs, excessive collateral requirements may restrict access to working capital needed for inventory acquisition, supplier payments and business continuity. This finding highlights the potential value of complementing conventional collateral requirements with risk-based credit assessment based on cash-flow capacity, credit history, repaymentbehaviour and business viability. Therefore, H02 is rejected.

Macroeconomic cost pressure also has a negative relationship with SME performance ($\beta = -0.292$, C.R. = -4.79, $p < 0.001$). Although smaller in absolute magnitude than the coefficients for financing architecture and collateral constraints, the relationship remains practically relevant within the estimated model. The finding suggests that inflation, exchange-rate movements and interest-rate pressures can constrain SME performance by increasing procurement, inventory replacement, financing and operating costs. For electronic-appliance SMEs, which may be particularly exposed to imported goods and exchange-rate movements, these pressures can reduce margins and increase working-capital requirements. The practical implication is that financing decisions should incorporate the expected cost of funds, exchange-rate exposure and inventory replacement requirements rather than considering loan availability in isolation. Accordingly, H03 is rejected.

Perceived regional institutional quality has a positive relationship with SME performance ($\beta = 0.217$, C.R. = 3.74, $p < 0.001$). Its coefficient is smaller than those of financing architecture,

collateral constraints and macroeconomic cost pressure, indicating a comparatively weaker association within the model. The result suggests that respondents who perceive their institutional environment as more predictable, effective and supportive also tend to report better SME performance. However, this finding should be interpreted cautiously because PRIQ is a perceptual measure reported by the same key informants, rather than an objective index of regulatory quality or institutional performance. Consequently, the result should not be interpreted as evidence that objectively measured institutional quality necessarily produces higher SME performance. Rather, it indicates an association between perceived institutional conditions and reported SME performance. Accordingly, H04 is rejected.

The R^2 value of 0.452 indicates that financing architecture, collateral constraints, macroeconomic cost pressure and perceived regional institutional quality jointly explain 45.2% of the variance in SME performance. This indicates meaningful explanatory capacity, while the remaining 54.8% represents unexplained variance associated with factors not included in the model.

Robustness and Interpretation of the Structural Relationships

The magnitude of the financing architecture coefficient warrants particular caution in interpretation. Although FA records the strongest coefficient in the model ($\beta = 0.427$), the cross-sectional design does not establish temporal precedence between financing conditions and SME performance. Consequently, **reverse causality cannot be ruled out**. Better-performing SMEs may have stronger financial records, more established banking relationships, greater bargaining power and better repayment histories, enabling them to obtain more favourable financing arrangements. Omitted firm-level characteristics, such as managerial capability, firm age, business scale, digital capability, entrepreneurial orientation or market position, may also contribute to the observed relationship.

No longitudinal, instrumental-variable or other formal endogeneity test was undertaken in the present study. Therefore, the coefficient should be interpreted as a conditional statistical association within the estimated model rather than an unbiased causal effect. This limitation is particularly important when considering the practical implications of the relatively large positive coefficient for financing architecture.

Similarly, the positive coefficient for PRIQ should not be interpreted as an objective measure of the effectiveness of regional institutions. Since PRIQ captures respondents' perceptions, the result may partly reflect differences in individual experiences, expectations or evaluations of the institutional environment. The finding therefore supports the relevance of perceived institutional conditions to SME performance but does not establish that objectively measured institutional quality has the same magnitude of relationship.

Taken together, the results indicate that financing architecture has the strongest observed association with SME performance among the predictors examined, while collateral constraints and macroeconomic cost pressure show substantial negative associations and perceived regional institutional quality shows a smaller positive association. These coefficient magnitudes provide a basis for practical interpretation, but they should be understood within the limitations of the cross-sectional, key-informant and perceptual measurement design. Future research should strengthen causal inference by incorporating longitudinal data, objective financial performance measures, objective institutional indicators and controls for relevant firm-level characteristics, together with appropriate endogeneity and robustness tests.

5.0 Conclusion

This study examined the relationships between financing architecture, collateral constraints, macroeconomic cost pressure, perceived regional institutional quality and the performance of electronic-appliance SMEs in selected Nigerian commercial centres. The findings indicate that financing architecture has the strongest positive relationship with SME performance ($\beta = 0.427$), suggesting that the configuration, accessibility, affordability, flexibility and suitability of financing sources and channels are important correlates of SME performance. In contrast, collateral constraints ($\beta = -0.330$) and macroeconomic cost pressure ($\beta = -0.292$) are negatively associated with SME performance, indicating that restrictive collateral requirements and adverse cost conditions are associated with weaker reported business outcomes. Perceived regional institutional quality also has a positive relationship with SME performance ($\beta = 0.217$), suggesting that more favourable perceived institutional conditions are associated with better reported SME performance.

The structural model explains 45.2% of the variance in SME performance, indicating meaningful explanatory capacity while also showing that other factors outside the model contribute to differences in SME performance. Overall, the findings suggest that improving the performance of electronic-appliance SMEs requires more than increasing access to credit. Attention should also be given to the configuration and suitability of financing arrangements, the burden imposed by collateral requirements, prevailing macroeconomic cost pressures and the institutional environment in which SMEs operate.

The study therefore concludes that a more supportive SME financing ecosystem should combine accessible and appropriate financing arrangements with flexible approaches to credit assessment, measures that mitigate macroeconomic cost pressures and improvements in institutional support. However, because the study employed a cross-sectional design and relied substantially on key-informant perceptions, the findings establish statistically significant associations rather than definitive causal relationships. Reverse causality and omitted-variable effects cannot be ruled out. For example, better-performing SMEs may be more capable of securing favourable financing arrangements. The findings should therefore be understood as evidence of relationships among the study variables rather than proof that changes in any individual predictor will necessarily produce corresponding changes in SME performance.

Recommendations

Financing architecture should be strengthened as a potential means of supporting SME performance. Given the positive relationship between financing architecture and SME performance, financial institutions, government agencies and SME-support organisations should broaden and improve the range of financing sources, instruments and channels available to electronic-appliance SMEs. Financing products should reflect the working-capital, inventory and cash-flow cycles of these businesses, with appropriate loan amounts, repayment periods, pricing and transaction costs. Greater complementarity between conventional bank finance, alternative financing and digital financing channels could also improve the suitability of financing arrangements for different SME needs.

Collateral constraints should be reduced through risk-based and character-based credit assessment. In view of the negative relationship between collateral constraints and SME performance, financial institutions should complement conventional collateral requirements with risk-based assessments based on cash-flow capacity, credit history, business records, repayment

behaviour and demonstrated business viability. Character-based unsecured lending could provide an additional option for creditworthy SMEs with limited fixed assets. Government-backed SME credit-guarantee schemes, drawing on models such as the U.S. Small Business Administration (SBA), could also reduce lenders' exposure to default risk and enable viable SMEs to obtain financing with less reliance on traditional collateral.

Measures should be introduced to mitigate macroeconomic cost pressures. Given the negative relationship between macroeconomic cost pressure and SME performance, government and relevant economic institutions should pursue measures that reduce the effects of inflation, exchange-rate instability and high interest rates on SME operations. Policies that improve access to affordable working capital and reduce energy, transportation and import-related costs would help electronic-appliance SMEs manage procurement, inventory replacement and operating expenses more effectively.

The institutional environment for SMEs should be strengthened. Given the positive relationship between perceived regional institutional quality and SME performance, government agencies and SME-support institutions should improve the efficiency, transparency and accessibility of business-related services. Simplified regulatory procedures, predictable administrative processes, accessible business information and responsive institutional support should be prioritised across commercial centres. However, because the empirical measure captures perceived institutional quality, such measures should be evaluated alongside objective indicators of regulatory and institutional performance in future assessments.

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