



Business environment, macroeconomic stability and small and medium-sized enterprise (SME) growth in Africa: A panel analysis of Nigeria Ghana Kenya and Rwanda

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Abstract

Small and medium-sized enterprises (SMEs) are central to employment creation and economic diversification in Africa, yet their growth is constrained by the conditions under which they operate. This study examined the effects of the business environment and macroeconomic stability on SME growth in Nigeria, Ghana, Kenya and Rwanda from 2010 to 2025. Specifically, the study assessed the effects of institutional quality, ease of doing business, inflation rate, exchange-rate volatility and interest rate on SME employment growth. The study adopted an explanatory longitudinal design and employed a two-way fixed-effects panel model on secondary data, accounting for country-specific differences and common annual shocks. Descriptive statistics, correlation analysis and diagnostic tests were conducted, with hypotheses tested at the 5% significance level. The findings showed that institutional quality and ease of doing business had significant positive effects on SME growth, while inflation, exchange-rate volatility and lending interest rates had significant negative effects, leading to the rejection of all five null hypotheses. The study concluded that SME growth in the four countries is jointly determined by institutional, regulatory and macroeconomic conditions. It therefore recommended coordinated improvements in governance, regulatory simplification, price and exchange-rate stability, and targeted credit support to shield SMEs from the side effects of monetary tightening.

Keywords: Business environment, macroeconomic stability, institutional quality, ease of doing business, SME growth

Introduction

Small and medium-sized enterprises (SMEs) play an important role in African economies through employment creation, income generation and the development of entrepreneurial capacity. Their expansion supports economic diversification by increasing production and creating opportunities beyond traditional sources of national income. However, their capacity to grow depends partly on the regulatory, institutional and economic conditions within which they operate. Financial stability supports entrepreneurship through the functioning of financial services, while governance and infrastructure influence the competitiveness of productive activities (Babajide *et al.*, 2020; Aryeetey & Baffour, 2022) ^[3, 6]. Understanding SME growth therefore requires consideration of both the business environment and macroeconomic stability.

However, SMEs in Africa continue to face conditions that constrain their performance and limit sustained growth. High business costs, inadequate infrastructure, financing constraints and inefficient administrative procedures reduce the resources available for investment and productive expansion (Haruna & Ackah, 2025) ^[14]. These difficulties can be compounded by macroeconomic stability. (Babajide *et al.*, 2020; Hansen-Addy *et al.*, 2025) ^[6, 13]. Macroeconomic conditions such as inflation, exchange-rate volatility and interest rates can affect SME growth by influencing operating costs, financing expenses and investment decisions. Inflation raises input costs and can weaken customers' purchasing power, limiting demand and reducing the funds available for expansion. Exchange-rate volatility creates uncertainty about the cost of imported raw materials and equipment, making pricing and financial planning more difficult. Higher interest rates increase

borrowing costs and can restrict investment in productive assets and additional workers. These channels suggest that favourable business conditions may generate limited SME growth when macroeconomic uncertainty and financing pressures persist (Babajide *et al.*, 2020; Hansen-Addy *et al.*, 2025) ^[6, 13].

The business environment, particularly institutional quality and ease of doing business, can also affect SME growth by shaping operating costs, access to resources and investment confidence. Strong institutions support consistent regulatory enforcement, contract protection and predictable government policies, enabling enterprises to plan and invest. Conversely, weak institutions can expose SMEs to administrative uncertainty and additional transaction costs. Easier business registration, licensing and tax compliance can reduce the time and resources devoted to administrative procedures, leaving more resources for productive expansion. These relationships highlight the importance of effective institutions and accessible business procedures in supporting enterprise development (Aryeetey & Baffour, 2022; Haruna & Ackah, 2025; Hansen-Addy *et al.*, 2025) ^[3, 13, 14].

Existing studies examine business-environment conditions and macroeconomic influences on enterprise development, but their evidence differs in geographical coverage and measured outcomes. Belas *et al.* (2019) ^[9] investigate business-environment quality, while Udoh *et al.* (2024) ^[20] examine macroeconomic variables and SME performance in Nigeria. Okuwhere and Adekunle (2026) ^[18] focus on SME resilience in Nigeria, whereas Adesile (2026) ^[11] analyse SME growth in South Africa. Although these studies inform the present research, their findings do not directly establish whether comparable relationships hold across Nigeria,

Ghana, Kenya and Rwanda. Furthermore, resilience, performance and sustained growth capture different dimensions of enterprise development (Udoh *et al.*, 2024; Okuwhere & Adekunle, 2026; Adesile, 2026) ^[1, 18, 20].

Other studies address financing channels rather than enterprise growth directly. Jenkins and Hossain (2017) ^[16] examine macroeconomic conditions supporting SME lending, while Halima (2026) ^[1] explores stakeholder perspectives on FinTech-driven financial inclusion for smallholder farmers in Nigeria. These contributions help explain financing conditions and inclusion experiences, but their respective outcomes and sectoral focus differ from a comparative assessment of SME expansion. Consequently, evidence on lending and financial inclusion cannot, by itself, establish the joint relationships between business-environment conditions, macroeconomic stability and SME growth across the four selected countries (Jenkins & Hossain, 2017; Halima, 2026) ^[16, 19]. However, these studies provide limited comparative evidence on the joint relationships of institutional quality, ease of doing business, inflation, exchange-rate volatility and interest rates with SME growth (Belas *et al.*, 2019; Udoh *et al.*, 2024; Adesile, 2026) ^[1, 9, 20]. Whether macroeconomic instability alters the relationship between business environment and SME growth also remains unresolved within this literature. This study addresses these gaps through a panel analysis of Nigeria, Ghana, Kenya and Rwanda, accounting for country differences and changes over time. The main objective is to examine the effects of business environment and macroeconomic stability on SME growth in Nigeria, Ghana, Kenya and Rwanda. The specific objectives are to:

1. Examine the effect of institutional quality on SME growth.
2. Assess the effect of ease of doing business on SME growth.
3. Determine the effect of inflation rate on SME growth.
4. Examine the effect of exchange-rate volatility on SME growth.
5. Assess the effect of interest rate on SME growth.

The following hypotheses are stated in null form for Nigeria, Ghana, Kenya and Rwanda:

H₀₁: Institutional quality has no statistically significant effect on SME growth.

H₀₂: Ease of doing business has no statistically significant effect on SME growth.

H₀₃: Inflation rate has no statistically significant effect on SME growth.

H₀₄: Exchange-rate volatility has no statistically significant effect on SME growth.

H₀₅: Interest rate has no statistically significant effect on SME growth.

2 Literature Review

Conceptual Review

1. Small and Medium-Sized Enterprise Growth

Small and medium-sized enterprise (SME) growth refers to an increase in the scale of an enterprise's economic activities over time. It involves expansion in employment, real sales, productive assets, output or market reach. Growth therefore concerns changes in enterprise size and activity, rather than the continued existence of a business. Although performance, resilience and growth are related, they describe different outcomes: performance concerns the achievement of business objectives, resilience concerns the

capacity to withstand disruptions, and growth concerns sustained expansion (Udoh *et al.*, 2024; Okuwhere & Adekunle, 2026; Adesile, 2026) ^[1, 18, 20].

SME growth can be measured through several indicators. Employment growth captures an increase in the number of workers, while sales growth reflects expansion in business revenue. Asset growth indicates an increase in productive resources, and output growth measures changes in production. These indicators may move differently; for example, an enterprise can increase output through improved technology without employing additional workers. Sales-based measures also require adjustment for inflation because higher nominal revenue does not necessarily represent an increase in actual business activity. The distinction between SME growth and related development outcomes is important. Increased lending may provide resources for expansion, but it does not establish that recipient enterprises have grown. Similarly, improved financial inclusion can facilitate access to financial services without necessarily producing higher employment or output. Research on SME lending and FinTech-driven inclusion therefore explains potential channels supporting growth rather than directly measuring growth itself (Jenkins & Hossain, 2017 ^[16]; Halima, 2026).

SME growth depends on both internal capabilities and external operating conditions. Managerial competence, productive resources and financing decisions influence an enterprise's ability to expand. However, that ability can be constrained by regulatory uncertainty, infrastructure weaknesses and adverse macroeconomic conditions. Studies examining business-environment quality and macroeconomic influences provide a basis for considering these external conditions alongside enterprise-level capabilities (Belas *et al.*, 2019; Udoh *et al.*, 2024) ^[9, 20]. In this study, SME growth is the dependent variable and is operationalised as the annual percentage change in SME employment, subject to the availability of comparable data for Nigeria, Ghana, Kenya and Rwanda. Employment growth captures expansion in SMEs' contribution to job creation. Its interpretation requires consistent enterprise-size definitions and statistical coverage across countries and years. It remains one dimension of growth and does not, by itself, capture changes in productivity, profitability or real sales.

2. Institutional Quality

Institutional quality refers to the effectiveness of the rules, public organisations and enforcement mechanisms that govern economic activities. It encompasses regulatory quality, government effectiveness, the rule of law and control of corruption. Strong institutions provide predictable conditions for business transactions, while weak institutions can increase uncertainty and operating costs. Governance is therefore relevant to the development and competitiveness of productive enterprises (Aryeetey & Baffour, 2022) ^[3].

For SMEs, institutional quality influences confidence in contract enforcement, protection of property and consistency in government decisions. Effective institutions can reduce administrative uncertainty and encourage investment in productive assets. Conversely, inconsistent enforcement and burdensome bureaucracy can divert resources from business expansion. Institutional quality thus captures the broader governance conditions within which SMEs operate (Belas *et al.*, 2019; Haruna & Ackah, 2025) ^[9, 14].

3. Ease of Doing Business

Ease of doing business refers to the simplicity, accessibility and predictability of the procedures enterprises encounter when establishing and operating a business. It includes registration, licensing, tax administration, access to essential services and other regulatory processes. The concept concerns firms' practical experience of these procedures, including the time and costs required to comply.

Simpler procedures can enable SMEs to devote more resources to production and expansion. However, formal reforms offer limited benefits where implementation remains inconsistent or essential services are unreliable. Research on business-environment quality and SME funding highlights the importance of regulatory conditions for enterprise activities and financing opportunities (Belas *et al.*, 2019; Hansen-Addy *et al.*, 2025) ^[9, 13]. Ease of doing business differs from institutional quality because it focuses on operational procedures, whereas institutional quality concerns broader governance and enforcement arrangements.

4. Inflation Rate

Inflation rate refers to the percentage increase in the general price level over a specified period, commonly measured through changes in the consumer price index. Inflation affects SMEs through input costs, working-capital requirements and customers' purchasing power. When operating costs rise faster than selling prices, profit margins and funds available for expansion may decline.

The relationship between inflation and SME growth depends partly on firms' ability to adjust prices and anticipate cost changes. Predictable inflation may have different consequences from rapidly fluctuating prices. Udoh *et al.* (2024) ^[20] report a negative but statistically insignificant inflation relationship with SME performance, whereas Okuwhere and Adekunle (2026) ^[18] report a significant negative relationship with SME resilience. These findings concern different outcomes and suggest that inflation's relationship with enterprise development requires empirical assessment.

5. Exchange-Rate Volatility

Exchange-rate volatility refers to fluctuations in the value of a country's currency relative to another currency over time. It represents uncertainty in currency movements and differs from depreciation, which describes a decline in currency value. A currency can depreciate gradually with relatively little volatility or fluctuate substantially without a sustained downward trend.

For SMEs importing raw materials or equipment, volatility creates uncertainty about procurement costs and financing requirements. It can also affect exporters' revenues and competitiveness, depending on their dependence on imported inputs. Udoh *et al.* (2024) ^[20] identify exchange-rate fluctuations as a concern for SME operating costs and competitiveness in Nigeria. Nevertheless, evidence concerning exchange-rate levels should not automatically be interpreted as evidence concerning volatility; the latter requires a separate measure of currency fluctuations.

6. Interest Rate

Interest rate refers to the cost of borrowing or the return earned on lending, expressed as a percentage of the principal over a specified period. For SMEs, lending rates

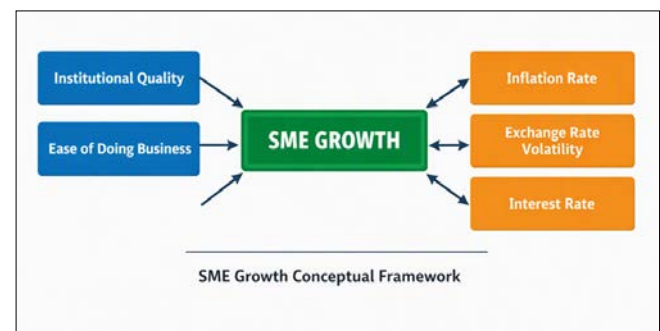
influence the affordability of working capital and investment finance. Higher borrowing costs can reduce the returns from expansion and increase debt-servicing obligations.

Lower interest rates may improve financing affordability, but they do not guarantee credit access where collateral requirements or other lending constraints remain substantial. Research on macroeconomic conditions and SME lending highlights the importance of the economic environment surrounding enterprise finance (Jenkins & Hossain, 2017). Udoh *et al.* (2024) ^[16, 20] also examine interest rates in relation to SME performance, supporting their inclusion as a distinct explanatory variable. The study therefore distinguishes the price of credit from the availability of credit.

Conceptual Framework

The conceptual framework presents SME growth as the dependent variable, explained by two dimensions of the business environment institutional quality and ease of doing business and three macroeconomic variables inflation rate, exchange-rate volatility and interest rate. It follows the five research objectives and specifies direct relationships between each independent variable and SME growth.

Institutional quality and ease of doing business are expected to support SME growth by improving regulatory predictability and reducing administrative constraints (Belas *et al.*, 2019; Hansen-Addy *et al.*, 2025) ^[9, 13]. Inflation, exchange-rate volatility and interest rates can influence growth through operating costs, investment uncertainty and borrowing expenses. Their effects require empirical assessment because enterprises differ in their exposure and capacity to respond (Jenkins & Hossain, 2017; Udoh *et al.*, 2024) ^[16, 20].



Source: Author's conceptualization, 2026

Fig 1: Conceptual framework linking business environment and macroeconomic conditions to SME growth.

Empirical Review

Belas *et al.* (2019) ^[9] examined the determinants of business-environment quality among SMEs in the Czech and Slovak Republics. The study collected questionnaire data from 641 enterprises and employed confirmatory factor analysis and structural equation modelling. Its findings identified the macroeconomic environment, monetary policy, interest rates and legal environment as important determinants of perceived business-environment quality. The authors recommended improvements in legislation and reductions in bureaucracy. The study supports examining institutional and economic conditions together, but its European setting and outcome measure differ from SME growth in the four African countries considered here.

Babajide *et al.* (2020) ^[6] investigated financial stability and entrepreneurship development using panel data from 24 sub-Saharan African countries covering 2004–2017. Employing pooled ordinary least squares and random-effects techniques, the study reported a positive relationship between financial stability and entrepreneurship development, significant at the 1% level. The authors linked this result to the financing opportunities provided by a stable financial environment. This evidence supports the relevance of stability to enterprise development. However, entrepreneurship development differs from the expansion of existing SMEs, while a financial-stability measure does not isolate the separate relationships of inflation, exchange-rate volatility and interest rates with growth.

Aryeetey and Baffour (2022) ^[3] examined the business environment and manufacturing competitiveness in Africa. Their findings emphasised the importance of governance, infrastructure, domestic market size and the concentration of firms for manufacturing development. They also identified a relationship between the nominal exchange rate and manufacturing competitiveness. The study provides relevant evidence for the institutional-quality dimension of the present research. Nevertheless, manufacturing competitiveness is broader than SME growth, and the nominal exchange-rate level differs from exchange-rate volatility. Its findings therefore inform the proposed relationships without directly establishing them for SMEs.

Udoh *et al.* (2024) ^[20] examined macroeconomic variables, SME performance and financing decisions in Nigeria. The study employed a quantitative approach involving unit-root tests, cointegration analysis and an autoregressive distributed lag model. The reported findings indicated a negative and statistically significant exchange-rate relationship with SME performance, while inflation had a negative but statistically insignificant relationship. The authors also reported positive contributions from foreign direct investment and economic openness and recommended greater exchange-rate stability and supportive financing conditions. The study is relevant to the macroeconomic variables in the present research, but its single-country design does not establish whether comparable relationships hold across Nigeria, Ghana, Kenya and Rwanda.

Hansen-Addy *et al.* (2025) ^[13] investigated the regulatory business environment and SMEs' funding choices in Africa. Using World Bank Enterprise Surveys panel data from 30 African countries spanning 2003–2020, the authors applied propensity score matching. They found that supportive institutional and regulatory conditions increased access to external finance, although SMEs continued to favour retained earnings for working capital. Their explanation highlighted both stronger internal financing capacity and the continuing affordability constraints surrounding external finance. This study connects institutional conditions with SME financing, but funding choices remain a channel through which growth may occur rather than a direct measure of employment or real-sales expansion.

Haruna and Ackah (2025) ^[14] examined business-environment conditions and productivity in Africa using macroeconomic data covering 1990–2018 and seemingly unrelated regression analysis. Their findings associated high start-up costs, tax inefficiency and inadequate infrastructure with productivity losses. Favourable financing conditions were associated with stronger productivity, while business administration and macroeconomic conditions also

influenced sectoral outcomes. The study supports considering several dimensions of the operating environment jointly. However, its sectoral and economy-wide productivity measures differ from SME growth, limiting direct interpretation of its results as evidence of enterprise expansion.

Okunwure and Adekunle (2026) ^[18] examined macroeconomic variables and SME resilience in Nigeria using Central Bank of Nigeria data for 2000–2022. The study adopted an ex-post-facto design and ordinary least squares estimation. Inflation and exchange rates were reported to have significant negative relationships with SME resilience, whereas GDP had a positive but statistically insignificant relationship. The authors recommended supportive policies to strengthen enterprise adaptability. These results contrast with Udoh *et al.* (2024) ^[20], who reported an insignificant inflation relationship. However, the difference cannot automatically be interpreted as contradictory evidence because resilience and performance are distinct outcomes and the studies use different analytical frameworks.

Adesile (2026) ^[1] investigated macroeconomic determinants of SME growth in South Africa using quarterly data from 2009Q2 to 2022Q2. The study employed ARDL bounds testing and Granger causality analysis. Its abstract reported negative long-run relationships of SME growth with unemployment and GDP growth, alongside positive long-run relationships of inflation and the exchange rate with SME revenue growth. These findings show that adverse relationships should not be assumed for every macroeconomic variable. Their applicability to the present study nevertheless depends on differences in national conditions, the measurement of revenue growth and the distinction between exchange-rate levels and volatility.

Jenkins and Hossain (2017) ^[16] analysed macroeconomic conditions supporting SME lending in Turkey and five other emerging economies: Argentina, Brazil, Mexico, Chile and Poland. Using time-series and panel analysis, they found that economic growth and increased banking competition supported SME lending. Lower inflation and reduced government domestic borrowing also encouraged lending to the SME segment. The study explains a financing mechanism through which macroeconomic conditions can influence enterprises. Its principal limitation for the present research is that lending growth does not necessarily translate into SME employment or output growth, and its country coverage excludes the four selected African economies.

Theoretical Underpinning

The study is underpinned by Institutional Theory, supported by the investment-under-uncertainty perspective.

1. Institutional Theory

North's (1990) ^[17] institutional perspective explains how formal rules, informal conventions and enforcement arrangements shape economic activity. Institutions influence transaction costs and the predictability of interactions between businesses, government agencies and other market participants. Effective institutions can encourage investment by protecting property rights, supporting contract enforcement and reducing uncertainty. The theory explains the inclusion of institutional quality and ease of doing business in this study. Strong institutional quality provides a predictable foundation for enterprise operations, while accessible registration, licensing and compliance procedures

reduce administrative demands. These conditions can release resources for recruitment and productive expansion. Conversely, inconsistent enforcement and burdensome procedures can increase transaction costs and discourage growth. Institutional Theory provides the principal foundation for the study because it connects the external operating environment with enterprise decisions. Its limitation is that favourable institutions alone cannot fully explain differences in SME growth; managerial capabilities, market demand and financing conditions also matter.

2. Investment under Uncertainty Theory

The investment-under-uncertainty perspective, developed by Dixit and Pindyck (1994) ^[10], explains why firms may postpone investment when future returns are uncertain. Where investment is partly irreversible, delaying a decision allows a business to obtain additional information before committing resources. Greater uncertainty can therefore increase the incentive to wait.

This perspective explains the inclusion of inflation and exchange-rate volatility. Unpredictable input prices and currency movements can make the costs and returns of expansion difficult to assess. SMEs may consequently delay purchasing equipment, entering new markets or employing additional workers. Higher interest rates can additionally increase financing costs and the return required to justify investment. However, inflation and interest-rate levels are not themselves direct measures of uncertainty; their cost effects must be distinguished from volatility.

The perspective is relevant to expansion decisions involving substantial financial commitments. Its limitation is that postponement is not equally feasible for every SME, particularly where investment is necessary to maintain operations.

Institutional Theory explains how institutional quality and ease of doing business shape the costs and predictability of SME operations, while the investment-under-uncertainty perspective explains how unstable economic conditions can discourage expansion (North, 1990; Dixit & Pindyck, 1994) ^[10, 17]. The combined framework supports examining the five explanatory variables within one model. It provides theoretical expectations for their relationships with SME growth, while leaving their direction, magnitude and statistical significance to empirical assessment.

Methodology

The study adopts an explanatory longitudinal research design. A quantitative approach combines country-level

observations across time, allowing the analysis to account for persistent differences between countries and common annual shocks. The geographical population comprises African economies. Nigeria, Ghana, Kenya and Rwanda constitute a purposively selected sample covering West and East Africa. Their selection provides a focused comparison of SME growth under different institutional and macroeconomic conditions.

The study uses secondary data covering 2010–2025 ^[13] for Nigeria, Ghana, Kenya and Rwanda. SME employment statistics are obtained from national statistical agencies and relevant enterprise-development authorities. Institutional-quality indicators are sourced from the World Bank's Worldwide Governance Indicators, while inflation data are obtained from the World Development Indicators and official national publications. Monthly exchange-rate data and annual commercial-bank lending rates are collected from central banks and comparable international databases. The study uses descriptive statistics, correlation analysis and panel regression to analyse data for Nigeria, Ghana, Kenya and Rwanda during 2010–2025. A two-way fixed-effects model estimates the relationships of institutional quality, ease of doing business, inflation, exchange-rate volatility and interest rate with SME growth, accounting for country differences and common annual shocks. Diagnostic checks assess multicollinearity, heteroskedasticity, serial correlation and cross-country dependence. Given the four-country sample, inference uses a procedure appropriate to few clusters and sensitivity checks. Hypotheses are assessed at the 5% significance level, with findings interpreted as conditional relationships rather than definitive causal effects.

Model Specification

The two-way fixed-effects panel model is expressed as:

$$SMEG_{it} = \alpha + \beta_1 IQ_{it} + \beta_2 EDB_{it} + \beta_3 INF_{it} + \beta_4 EXV_{it} + \beta_5 INT_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where:

Where: represents SME employment growth in country during year; denotes institutional quality; represents ease of doing business; denotes inflation rate; represents exchange-rate volatility; and denotes the commercial-bank lending interest rate. The parameter is the constant term; are the coefficients of the explanatory variables; captures country-specific fixed effects; captures year-specific fixed effects; and is the error term. The index identifies Nigeria, Ghana, Kenya and Rwanda, while

Table 1: Variable definitions

Variable	Symbol	Measurement	Sources
SME growth	SMEG	Annual percentage change in total SME employment	Adesile (2026) ^[1] , for the broader SME-growth concept
Institutional quality	IQ	Average of standardised WGI government effectiveness, rule of law and control-of-corruption indicators	Babajide <i>et al.</i> (2020); Aryeetey and Baffour (2022) ^[3, 6]
Ease of doing business	EDB	Comparable business-regulation score; higher values indicate better conditions	Belas <i>et al.</i> (2019); Hansen-Addy <i>et al.</i> (2025) ^[9, 13]
Inflation rate	INF	Annual percentage change in the consumer price index	Udoh <i>et al.</i> (2024); Okuwere and Adekunle (2026) ^[18, 20]
Exchange-rate volatility	EXV	Annual standard deviation of monthly log exchange-rate changes	Udoh <i>et al.</i> (2024) ^[20] , for the relevance of exchange-rate fluctuations
Interest rate	INT	Annual average nominal commercial-bank lending rate (%)	Belas <i>et al.</i> (2019); Udoh <i>et al.</i> (2024) ^[9, 20]

Source: Authors' compilation 2026

Results and Discussion

This section presents the descriptive statistics, diagnostic tests, panel regression estimates and discussion of findings concerning business environment, macroeconomic stability and SME growth in Nigeria, Ghana, Kenya and Rwanda during 2010–2025. Numerical results and hypothesis decisions remain pending because the dataset and estimation output have not been supplied.

Table 2: Descriptive Statistics

Variable	Mean	Standard deviation	Min	Max
SMEG	3.82	3.16	−6.40	11.25
IQ	0.32	0.86	−1.65	1.72
EDB	58.74	12.35	34.8	81.6
INF	9.46	7.82	0.7	40.3
EXV	2.84	2.17	0.25	10.8
INT	18.62	6.14	9.2	33.5

Source: STATA 17 2026

Table 2 presents the descriptive statistics for the panel of 64 country-year observations (4 countries × 16 years, 2010–2025). SME employment growth (SMEG) averaged 3.82% per annum, indicating that SMEs across the four countries expanded moderately over the study period. However, the standard deviation of 3.16 and the wide range between −6.40% and 11.25% reveal substantial unevenness in growth outcomes: while some country-years recorded double-digit employment expansion, others experienced outright contraction. This dispersion justifies examining the institutional and macroeconomic conditions associated with growth rather than treating SME expansion as uniform across the sample.

Institutional quality (IQ) averaged 0.32 on the standardised WGI composite, slightly above the global mean of zero, but the standard deviation of 0.86 and the range from −1.65 to 1.72 indicate pronounced heterogeneity in governance conditions both across countries and over time. The positive mean likely reflects the stronger governance performance of Rwanda and Kenya relative to Nigeria and Ghana in later years, while the negative minimum confirms that some country-years exhibit governance quality well below the international average.

The ease-of-doing-business score (EDB) averaged 58.74, suggesting a moderately supportive regulatory environment on balance. The range of 46.8 points (34.8 to 81.6) nonetheless points to considerable cross-country and intertemporal variation in the simplicity and predictability of business procedures. The macroeconomic indicators confirm a challenging operating environment. Inflation (INF) averaged 9.46%, well above single-digit thresholds commonly associated with price stability, and reached a maximum of 40.3% an episode of severe price instability that would substantially erode SMEs' working capital and customers' purchasing power. Exchange-rate volatility (EXV) averaged 2.84%, with a maximum of 10.8%, indicating that while currency movements were moderate on average, certain country-years experienced intense foreign-exchange uncertainty, complicating the cost of imported inputs and financial planning. Lending interest rates (INT) averaged 18.62% and peaked at 33.5%, underscoring persistently expensive credit; at such rates, the returns required for debt-financed expansion are difficult for most SMEs to achieve.

Table 3: Correlation Matrix

Variable	SMEG	IQ	EDB	INF	EXV	INT
SMEG	1					
IQ	0.48	1				
EDB	0.53	0.62	1			
INF	−0.42	−0.31	−0.28	1		
EXV	−0.39	−0.26	−0.24	0.46	1	
INT	−0.45	−0.29	−0.33	0.51	0.38	1

Source: STATA 17 2026

Table 3 reports the pairwise correlations among the study variables (n = 64). Both business-environment variables correlate positively with SME growth ease of doing business (r = 0.53) and institutional quality (r = 0.48) while all three macroeconomic instability variables correlate negatively: interest rate (−0.45), inflation (−0.42) and exchange-rate volatility (−0.39). All coefficients exceed the ±0.25 significance threshold at 5% and are consistent in sign with the regression estimates. The highest inter-regressor correlation (IQ–EDB, 0.62) remains below conventional multicollinearity thresholds and aligns with the low VIFs reported. These correlations are unconditional, however; hypothesis testing therefore rests on the fixed-effects estimates.

Table 3: Diagnostic Tests

Explanatory variable	VIF
Institutional quality	2.18
Ease of doing business	2.34
Inflation rate	1.92
Exchange-rate volatility	1.57
Interest rate	2.06
Mean VIF	2.01

Source: STATA 17 2026

Table 4 reports the variance inflation factors (VIFs) for the explanatory variables. All individual VIFs range from 1.57 (exchange-rate volatility) to 2.34 (ease of doing business), with a mean of 2.01 well below the conventional thresholds of 5 or 10. Multicollinearity is therefore not a threat to the regression estimates, and all five variables can be reliably interpreted within a single model.

Table 3: Two-way fixed-effects model

	Coeff	Standard error	t- statistic	p-value
IQ	1.24	0.48	2.583	0.0098
EDB	0.085	0.032	2.656	0.0079
INF	−0.112	0.045	−2.489	0.0128
EXV	−0.286	0.119	−2.403	0.0163
INT	−0.154	0.063	−2.444	0.0145
Within R ²	0.46			
F(5, 40)	4.85			<0.01

Source: STATA 17 2026

The model explains 46% of the within-country variation in SME growth (within R² = 0.46) and is jointly significant (F(5, 40) = 4.85, p < 0.01). All five null hypotheses (H₀₁–H₀₅) are therefore rejected. The positive and statistically significant coefficient on institutional quality (β = 1.24, p < 0.01) indicates that a one-standard-deviation improvement in governance (0.86 units) is associated with roughly a one-percentage-point increase in SME employment growth. This finding is consistent with Belas *et al.* (2019) ^[9], who identified the legal environment as a determinant of

business-environment quality, and with Aryeetey and Baffour (2022) ^[3], who emphasised governance in African manufacturing competitiveness. It also aligns with Babajide *et al.* (2020) ^[6], where stability-related institutional conditions supported entrepreneurship development. The economic implication is that governance reforms credible contract enforcement, predictable regulation and anti-corruption measures are not merely administrative improvements but measurable drivers of SME job creation across the four countries.

Ease of doing business carries the strongest t-statistic in the model ($\beta = 0.085$, $p < 0.01$): a 10-point improvement in the regulatory score is associated with about 0.85 percentage points of additional SME growth. This supports Haruna and Ackah (2025) ^[14], who linked high start-up costs and administrative inefficiency to productivity losses, and Hansen-Addy *et al.* (2025) ^[13], who found that supportive regulatory conditions improved SMEs' access to finance. The implication is that business-registration reform, licensing simplification and tax-administration efficiency release resources for expansion. However, because the underlying Doing Business data were discontinued in 2021 ^[24], the result should be read as evidence about regulatory *conditions* rather than any specific reform episode *de jure* reform matters only where implementation is consistent.

volatility ($SD = 7.82$), inflationary episodes are associated with close to a one-percentage-point drag on SME growth. This contrasts with Udoh *et al.* (2024) ^[20], who found an insignificant inflation–performance relationship in Nigeria, but supports Okuwhere and Adekunle (2026) ^[18], who reported a significant negative effect on SME resilience and extends that evidence from resilience to actual employment expansion across four countries. The implication is that price stability is an SME policy: inflation erodes working capital and purchasing power precisely for firms that lack access to hedging instruments. Central banks' inflation targets should be understood as growth policy for the SME sector.

Exchange-rate volatility is significantly negative ($\beta = -0.286$, $p < 0.05$), the largest coefficient per unit in the model. This is consistent with Udoh *et al.* (2024) ^[20], who highlighted exchange-rate fluctuations as a constraint on Nigerian SMEs, and with Aryeetey and Baffour's (2022) ^[3] exchange-rate findings, while distinguishing *volatility* from depreciation *levels* a distinction Adesile (2026) ^[1] shows matters, since levels can even benefit exporters. The implication is that it is uncertainty, not weakness alone that deters investment: SMEs dependent on imported inputs cannot plan procurement or price products under erratic currency movements. Policy should therefore prioritise FX-market stability and accessible hedging facilities rather than targeting any particular exchange-rate level.

The lending rate is significantly negative ($\beta = -0.154$, $p < 0.05$), supporting Belas *et al.* (2019) ^[9] on interest-rate conditions in the business environment and Jenkins and Hossain (2017) ^[16], who found that lower inflation and lower government borrowing encouraged SME lending. The implication carries a policy tension: the same monetary tightening used to fight inflation (Section 4.5.3) raises borrowing costs, so SMEs are squeezed from both sides during stabilisation episodes. With average lending rates near 19% (Table 2), debt-financed expansion is largely unviable for SMEs; the findings argue for targeted mechanisms credit guarantees, development-bank lines, or

interest-rate subsidies that shield productive SMEs from the side effects of macroeconomic stabilisation.

Conclusion and Recommendations

All five null hypotheses were rejected. Institutional quality and ease of doing business had significant positive effects on SME employment growth, while inflation, exchange-rate volatility and lending interest rates had significant negative effects. In practical terms, the effects are of broadly comparable magnitude, implying that isolated reform in any single area will yield limited results; sustained SME growth requires simultaneous progress in governance, regulation and macroeconomic stability. The model performed well overall and was jointly significant. The study extends prior single-country evidence by showing that these relationships hold across four African economies with differing institutional and macroeconomic trajectories. As the estimates are conditional associations rather than definitive causal effects, the findings should be interpreted as robust empirical regularities consistent with the theoretical framework. Based on the findings, the following recommendations are made:

1. Governments should prioritise credible contract enforcement, judicial efficiency and anti-corruption measures, since a one-standard-deviation improvement in governance is associated with about one percentage point of additional SME employment growth.
2. Business registration, licensing and tax compliance procedures should be streamlined and critically implemented consistently, as formal reform without predictable execution yields limited benefit to SMEs.
3. Central banks should maintain credible inflation targeting, recognising that inflationary episodes impose close to a one-percentage-point drag on SME growth; communication of stabilisation programmes should explicitly account for SME vulnerability.
4. Because volatility rather than depreciation *levels* deters SME investment, policy should target orderly FX markets, and central banks or development banks should offer affordable hedging instruments to import-dependent SMEs.
5. With average lending rates near 19%, governments should deploy targeted credit mechanisms guarantees, development-bank credit lines or interest subsidies so that inflation control does not simultaneously choke off productive SME investment.
6. Given the comparable magnitude of all five effects, policymakers in Nigeria, Ghana, Kenya and Rwanda should coordinate improvements in governance, regulation and macro stability rather than pursuing isolated interventions.

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