INNOVATION MANAGEMENT AND BUSINESS GROWTH OF SMALL AND MEDIUM-SIZED ENTERPRISES IN ADAMAWA STATE, NIGERIA

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ABSTRACT

This study examines the effect of innovation management on the business growth of Small and Medium-Sized Enterprises (SMEs) in Adamawa State, Nigeria. Grounded in Schumpeter's Theory of Innovation and Creative Destruction (1934, 1942), the research investigates how product innovation, process innovation, marketing innovation, organisational innovation, and innovation leadership collectively and individually influence the business growth of SMEs operating in a post-conflict, agrarian economy. A quantitative, cross-sectional survey design was adopted, with primary data collected through structured questionnaires administered to 372 owner-managers and senior executives of SMEs across three senatorial districts (Adamawa North, Adamawa Central, and Adamawa South) of the state. Data were analysed using descriptive statistics, Pearson product-moment correlation, and multiple linear regression estimated via Ordinary Least Squares (OLS). The findings reveal that product innovation ($\beta = 0.264$, $p < 0.001$), process innovation ($\beta = 0.218$, $p < 0.001$), marketing innovation ($\beta = 0.187$, $p < 0.01$), organisational innovation ($\beta = 0.152$, $p < 0.01$), and innovation leadership ($\beta = 0.239$, $p < 0.001$) all exert statistically significant positive effects on business growth. The model explains 71.6% of the variance in business growth (Adjusted $R^2 = 0.716$; $F = 186.54$, $p < 0.001$). The study concludes that innovation management is a critical driver of SME growth in Adamawa State and recommends that SME owners invest systematically in innovation capabilities, that the Adamawa State Government and development partners establish innovation support ecosystems, and that post-conflict reconstruction programmes integrate enterprise innovation as a core pillar of economic recovery.

Keywords: Innovation Management, Business Growth, Small and Medium-Sized Enterprises, Adamawa State, Schumpeterian Theory, Multiple Regression, Post-Conflict Economy.

1. INTRODUCTION

Small and Medium-Sized Enterprises (SMEs) constitute the engine of economic diversification, employment generation, and poverty alleviation in developing economies (Acs, Audretsch, & Lehmann, 2018). In Nigeria, SMEs account for approximately 96% of all registered businesses, contribute 48% of the Gross Domestic Product (GDP), and generate over 84% of employment (National Bureau of Statistics [NBS], 2023; Small and Medium Enterprises Development Agency of Nigeria [SMEDAN], 2022). Within this national landscape, SMEs in Adamawa State occupy a distinctive and strategically important position. Adamawa, located in North-East Nigeria, is characterised by a predominantly

agrarian economy, a young and growing population, rich cultural heritage, and significant natural resources including arable land, livestock, and solid minerals (Adamawa State Government, 2023).

However, Adamawa State's SME ecosystem operates under uniquely challenging conditions. The state was severely affected by the Boko Haram insurgency between 2012 and 2019, which displaced over 1.2 million persons, destroyed critical infrastructure, disrupted supply chains, and devastated local enterprises (United Nations Development Programme [UNDP], 2021; World Bank, 2022). The post-conflict recovery phase, while showing progress, continues to be constrained by security uncertainties, infrastructural deficits, limited access to finance, low technological adoption, and weak institutional support for enterprise development (Adamawa State Ministry of Commerce and Industry [ASMC], 2023; International Organization for Migration [IOM], 2023).

In this context, innovation management—the systematic process of generating, developing, and implementing new ideas, products, processes, and business models to create value (Tidd & Bessant, 2020)—emerges as a critical determinant of whether SMEs in Adamawa State can recover, grow, and compete. Innovation enables SMEs to differentiate their offerings, reduce operational costs, access new markets, build resilience against shocks, and create sustainable value (Schumpeter, 1934; Drucker, 1985; OECD, 2018). For post-conflict economies, innovation is not merely a competitive strategy but a survival imperative, as it allows enterprises to adapt to radically altered market conditions, rebuild disrupted value chains, and exploit emerging opportunities in reconstruction and peacebuilding (Collier, 2007; UNDP, 2021).

Despite the critical importance of innovation for SME growth in Adamawa State, empirical evidence on the specific dimensions of innovation management that drive business growth in this context remains scarce. Most existing studies on Nigerian SMEs focus on the southern and western regions, where business environments are comparatively stable and infrastructure is more developed (Okafor, Eze, & Nwankwo, 2021; Adegbite & Adeyemi, 2023). The North-East, and Adamawa State in particular, is significantly underrepresented in the innovation and entrepreneurship literature (Mohammed & Ibrahim, 2022; Bello & Adamu, 2023). This geographical bias limits the generalisability of existing findings and leaves a critical knowledge gap regarding how innovation functions in fragile, post-conflict, and agrarian settings.

Furthermore, while prior Nigerian studies have examined innovation in aggregate or focused narrowly on product or technological innovation (Eze & Nwankwo, 2022), few have adopted a multidimensional framework that captures product, process, marketing, and organisational innovation simultaneously, alongside the leadership and strategic dimensions that enable innovation to flourish (Tidd & Bessant, 2020; OECD, 2018).

The study is significant for multiple stakeholders. For SME owner-managers in Adamawa State, it provides evidence-based guidance on which innovation practices yield the greatest growth returns. For the Adamawa State Government, the North-East Development Commission (NEDC), and development partners (UNDP, World Bank, USAID), it informs the design of post-conflict enterprise recovery and innovation support programmes. For academics, it extends the application of Schumpeterian innovation theory to a fragile, post-conflict SME context in sub-Saharan Africa. The paper is structured as follows: Section 2 presents the literature review; Section 3 outlines the methodology; Section 4 reports the results and discussion; and Section 5 provides the conclusion and recommendations.

2. LITERATURE REVIEW

2.1 Theoretical Framework: Schumpeter's Theory of Innovation and Creative Destruction

This study is anchored on Joseph Alois Schumpeter's Theory of Innovation and Creative Destruction, originally articulated in *The Theory of Economic Development* (1934) and further elaborated in *Capitalism, Socialism and*

Democracy (1942). Schumpeter (1934) conceptualised innovation as the primary driver of economic development and firm growth, distinguishing it fundamentally from mere invention. While invention refers to the creation of new ideas, innovation refers to the commercial application and diffusion of those ideas in the marketplace (Schumpeter, 1934).

Schumpeter (1934) identified five types of innovation that drive economic change: (i) the introduction of new products or services; (ii) the introduction of new methods of production (process innovation); (iii) the opening of new markets (market/marketing innovation); (iv) the conquest of new sources of supply of raw materials; and (v) the creation of new organisational structures or market positions (organisational innovation). These five categories map directly onto the innovation dimensions examined in this study.

The concept of creative destruction—the process by which new innovations continuously destroy old economic structures while creating new ones—is central to Schumpeter's framework (Schumpeter, 1942). In the context of Adamawa State's post-conflict economy, creative destruction takes on heightened significance. The insurgency destroyed existing market structures, supply chains, and business models. SMEs that innovate—introducing new products adapted to post-conflict needs, adopting new processes to overcome infrastructure deficits, accessing new markets through digital channels, and reorganising their operations—are engaging in Schumpeterian creative destruction, rebuilding the economy on new and potentially more resilient foundations (Collier, 2007; UNDP, 2021).

Schumpeter (1934) further emphasised the role of the entrepreneur as the agent of innovation. The entrepreneur is not merely a manager or capitalist but a visionary who perceives opportunities, mobilises resources, and drives the "new combinations" that constitute innovation. In the SME context, the owner-manager typically embodies this entrepreneurial function, making innovation leadership a critical determinant of firm-level innovation and growth (Drucker, 1985; Tidd & Bessant, 2020).

The Schumpeterian framework is selected for this study because it provides a comprehensive, multidimensional typology of innovation that aligns with the study's research objectives. Unlike narrower theories such as the Technology Acceptance Model (which focuses on adoption of specific technologies) or the Resource-Based View (which focuses on resource endowments), Schumpeter's theory directly links the management and execution of innovation to firm growth and economic development—the central concern of this study (Schumpeter, 1934, 1942; Fagerberg, 2005).

2.2 Conceptual Review

2.2.1 Innovation Management

Innovation management is defined as the systematic process of planning, organising, directing, and controlling innovation activities within an organisation to achieve strategic objectives (Tidd & Bessant, 2020). It encompasses the generation of creative ideas, their evaluation and selection, development and testing, and commercialisation or implementation (OECD, 2018). Effective innovation management requires a supportive organisational culture, adequate resource allocation, leadership commitment, and alignment with the firm's strategic direction (Drucker, 1985; Chesbrough, 2003).

For SMEs, innovation management is often less formalised than in large corporations. SMEs typically innovate through informal networks, customer interactions, owner-manager intuition, and adaptive responses to market pressures rather than through dedicated R&D departments (Rothwell & Dodgson, 1991; North, Smallbone, & Vickers, 2001). In developing economies and post-conflict settings, SME innovation is further shaped by resource scarcity, institutional voids, and the need for frugal or grassroots innovation (Prahalad, 2010; Mohammed & Ibrahim, 2022).

2.2.2 Dimensions of Innovation

Following the Schumpeterian typology and the OECD Oslo Manual (2018), this study operationalises innovation management through five dimensions:

Product Innovation: The introduction of new or significantly improved goods or services. For SMEs in Adamawa State, product innovation may include developing new agro-processed products, introducing fortified food items, creating artisanal goods for tourism, or adapting products to post-conflict consumer needs (Adamu & Bello, 2022; OECD, 2018).

Process Innovation: The implementation of new or significantly improved production, delivery, or support methods. This includes adopting new technologies, streamlining operations, improving supply chain management, and introducing quality control systems (Tidd & Bessant, 2020). In Adamawa's agrarian context, process innovation may involve mechanised farming techniques, improved post-harvest processing, or digital inventory management.

Marketing Innovation: The implementation of new marketing methods involving significant changes in product design, packaging, placement, promotion, or pricing (OECD, 2018). For Adamawa SMEs, this includes leveraging social media and mobile platforms to reach customers, developing new branding strategies, entering new geographic markets, and adopting innovative pricing models (Bello & Adamu, 2023).

Organisational Innovation: The implementation of new organisational methods in business practices, workplace organisation, or external relations (OECD, 2018). This includes adopting new management structures, forming cooperative networks, implementing human resource development practices, and building strategic partnerships (Tidd & Bessant, 2020).

Innovation Leadership: The strategic orientation, vision, and commitment of the owner-manager or leadership team toward fostering a culture of innovation within the enterprise (Drucker, 1985; West, 2000). This includes allocating resources to innovation, encouraging experimentation, tolerating failure, and championing new ideas (Schumpeter, 1934; Chesbrough, 2003).

2.2.3 Business Growth

Business growth is a multidimensional construct reflecting the expansion of a firm over time in terms of size, revenue, market presence, and capabilities (Penrose, 1959; Davidsson, Achtenhagen, & Naldi, 2010). For SMEs, growth indicators include revenue/sales growth, employee growth, asset expansion, market share increase, geographical expansion, and product/service diversification (Venkatraman & Ramanujam, 1986; Davidsson et al., 2010).

In the Adamawa State context, business growth must be understood against the backdrop of post-conflict recovery. Growth may involve rebuilding destroyed assets, re-entering disrupted markets, recapturing lost customers, and establishing new operations in previously inaccessible areas (UNDP, 2021; IOM, 2023). This study measures business growth as a composite of revenue growth, employee growth, market expansion, and asset accumulation over a three-year period.

2.2.4 SMEs in Adamawa State: Context and Characteristics

Adamawa State, with a population of approximately 4.2 million (National Population Commission [NPC], 2023), has an economy dominated by agriculture (crop farming and livestock), trade, and small-scale manufacturing. The state produces significant quantities of cotton, groundnut, maize, sorghum, rice, and livestock (Adamawa State Government, 2023). SMEs in the state are concentrated in agro-processing, retail trade, tailoring and textiles, food services, construction, transportation, and emerging ICT services (SMEDAN & NBS, 2022; ASMC, 2023).

The Boko Haram insurgency (2012–2019) had devastating effects on the state's SME ecosystem. An estimated 40% of SMEs in the most affected local government areas (Madagali, Michika, Gwoza, and Bama—though Gwoza and Bama are in Borno State, their proximity affected Adamawa) were destroyed or forced to close (UNDP, 2021). The post-2019 recovery period has seen gradual rebuilding, supported by interventions from the NEDC, the World Bank's North-East Recovery and Reconstruction Project, and various NGO programmes (World Bank, 2022; NEDC, 2023).

Despite recovery efforts, SMEs in Adamawa face persistent challenges: limited access to formal credit (only 18% of SMEs report having bank

loans), poor road and power infrastructure, low digital connectivity, skills shortages, and lingering security concerns in some areas (ASMC, 2023; CBN, 2023). These constraints make innovation not merely desirable but essential for survival and growth.

2.2.5 The Nexus Between Innovation Management and Business Growth

Conceptually, innovation management drives business growth through multiple pathways. Product innovation creates new revenue streams and differentiates firms from competitors (Schumpeter, 1934). Process innovation reduces costs, improves quality, and increases productivity, enhancing profit margins (Tidd & Bessant, 2020). Marketing innovation expands market reach, attracts new customers, and strengthens brand equity (OECD, 2018). Organisational innovation improves coordination, knowledge sharing, and operational efficiency (Chesbrough, 2003). Innovation leadership provides the strategic direction, resource commitment, and cultural foundation that enable all other innovation activities to flourish (Drucker, 1985; West, 2000).

In post-conflict economies, these pathways are amplified. Innovation enables SMEs to fill gaps created by the destruction of established firms, adapt to changed consumer preferences, leverage reconstruction spending, and build resilience against future shocks (Collier, 2007; UNDP, 2021). The Schumpeterian process of creative destruction is thus accelerated in post-conflict settings, as the destruction of old structures creates space for new combinations and entrepreneurial ventures (Schumpeter, 1942).

2.3 Empirical Review

The empirical literature on innovation and SME growth is extensive globally but limited in the Nigerian and particularly North-East Nigerian context.

Rothwell and Dodgson (1991) conducted a seminal study of innovation in small firms, demonstrating that SMEs innovate differently from large firms—relying more on external networks, customer feedback, and incremental adaptation than on formal R&D. Their findings established that innovation is not the exclusive domain of large corporations and that SMEs can achieve significant growth through targeted, resource-efficient innovation.

North, Smallbone, and Vickers (2001) examined innovation in UK SMEs and found that product and process innovation were the most common forms, and that innovation activity was positively associated with employment growth and turnover growth. The study highlighted the importance of owner-manager characteristics and external networks as enablers of SME innovation.

Laforet and Tannock (2000) investigated innovation in small manufacturing firms and found that organisational culture, leadership commitment, and customer orientation were critical determinants of innovation success. Firms with strong innovation leadership outperformed those that relied on ad hoc, reactive approaches.

In the Nigerian context, Eze and Nwankwo (2022) examined the role of innovation strategy in the competitive advantage of technology-based SMEs in Abuja and Lagos. Using hierarchical regression on data from 180 firms, they found that product and process innovation significantly predicted competitive advantage, explaining 29% of the variance. However, the study did not examine marketing or organisational innovation dimensions.

Mohammed and Ibrahim (2022) studied the impact of innovation on the survival and growth of SMEs in post-conflict Borno and Adamawa states. Using a sample of 210 SMEs and logistic regression, they found that SMEs that introduced new products or services in the post-conflict period were 2.4 times more likely to survive and grow than those that did not. The study attributed this to the ability of innovative firms to fill market gaps created by the insurgency. However, the study used a binary innovation measure and did not disaggregate innovation types.

Bello and Adamu (2023) examined the effect of digital innovation on the performance of SMEs in Adamawa State. Surveying 150 SMEs in Yola and Mubi, they used simple linear regression and found that digital marketing and mobile payment adoption significantly improved sales revenue. The study recommended greater investment in

digital infrastructure but was limited by its narrow focus on digital innovation and small sample size.

Adamu and Bello (2022) investigated product innovation and market performance of agro-processing SMEs in Adamawa State. Using a sample of 120 firms and Pearson correlation with simple regression, they found a significant positive relationship between product innovation (new product development, packaging improvement) and market performance (sales volume, customer base). The study highlighted the potential of agro-innovation in the state's agrarian economy.

Adegbite and Adeyemi (2023) examined strategic management and innovation practices of manufacturing SMEs in South-West Nigeria. While not focused on Adamawa, their finding that innovation capability mediated the relationship between strategic management and performance is relevant. They recommended that innovation be embedded in the strategic orientation of Nigerian SMEs.

Okafor, Eze, and Nwankwo (2021) studied strategic practices and performance of SMEs in Lagos State. While focused on strategic management broadly, their finding that proactive, forward-looking management practices (including innovation orientation) significantly predicted performance supports the innovation–growth nexus.

Nwankwo, Eze, and Okoye (2023) examined strategic management and competitive advantage of SMEs across Nigeria's six geopolitical zones. The North-East zone showed the lowest levels of strategic management adoption and innovation activity, attributed to infrastructure deficits and post-conflict disruption. The study recommended targeted intervention in the region.

Oyelaran-Oyeyinka and Lal (2006) provided a comprehensive analysis of innovation systems in sub-Saharan Africa, arguing that weak national innovation systems, limited R&D investment, and inadequate intellectual property protection constrain SME innovation in the region. They recommended building innovation ecosystems through public-private partnerships. Table 1 summarises the empirical literature.

Table 1: Summary of Empirical Literature

Author(s)	Year	Country/Scope	Method	Key Findings
Rothwell & Dodgson	1991	UK SMEs	Case study/Survey	SMEs innovate through networks and incremental adaptation
North et al.	2001	UK SMEs	Survey/Regression	Product and process innovation positively associated with growth
Laforet & Tannock	2000	UK manufacturing	Survey	Leadership and culture critical for innovation success
Oyelaran-Oyeyinka & Lal	2006	Sub-Saharan Africa	Comparative analysis	Weak innovation systems constrain SME innovation
Eze & Nwankwo	2022	Nigeria (Abuja/Lagos)	Hierarchical Regression	Product and process innovation predict competitive advantage
Mohammed & Ibrahim	2022	Nigeria (Borno/Adamawa)	Logistic Regression	Innovative SMEs 2.4× more likely to survive post-conflict

Adamu & Bello	2022	Nigeria (Adamawa, 120 SMEs)	Correlation/Regression	Product innovation positively affects agro-SME market performance
Okafor et al.	2021	Nigeria (Lagos)	OLS	Proactive management practices predict SME performance
Bello & Adamu	2023	Nigeria (Adamawa, 150 SMEs)	Simple Regression	Digital innovation improves SME sales revenue
Adegbite & Adeyemi	2023	Nigeria (South-West)	Multiple Regression	Innovation mediates strategy–performance link
Nwankwo et al.	2023	Nigeria (6 zones)	PLS-SEM	North-East shows lowest innovation adoption

Source: Author's compilation (2025).

The reviewed literature confirms a positive innovation–growth relationship but reveals significant gaps. No study has simultaneously examined five dimensions of innovation management (product, process, marketing, organisational, and leadership) within a unified multiple regression framework in Adamawa State. The few Adamawa-specific studies use narrow innovation measures, small samples, or bivariate techniques. This study addresses these limitations.

3. METHODOLOGY

This study adopts a quantitative, cross-sectional survey research design, which is appropriate for measuring the magnitude, direction, and statistical significance of the relationship between innovation management practices and business growth using numerical data and inferential statistics (Creswell & Creswell, 2018; Saunders, Lewis, & Thornhill, 2019). The cross-sectional design captures a snapshot of innovation practices and growth outcomes at a single point in time, which is suitable for establishing associative relationships among the study variables. The study is conducted in Adamawa State, located in North-East Nigeria. Adamawa State comprises 21 Local Government Areas (LGAs) organised into three senatorial districts: Adamawa North (comprising Mubi North, Mubi South, Michika, Madagali, and other LGAs), Adamawa Central (Yola North, Yola South, Fufore, Song, and others), and Adamawa South (Numan, Shelleng, Guyuk, and others), with Yola serving as the state capital. The selection of Adamawa State is justified by its unique post-conflict economic context, its predominantly agrarian base, and its significant underrepresentation in the innovation and entrepreneurship literature.

The target population for this study comprises registered SMEs in Adamawa State. According to the Adamawa State Ministry of Commerce and Industry (ASMC, 2023) and SMEDAN records, there are approximately 42,500 registered SMEs in the state. The sample size was determined using Cochran's (1977) formula for large populations, expressed as:

$n = Z^2pq/e^2$, where $Z = 1.96$ at the 95% confidence level, $p = 0.5$ representing maximum variability, $q = 1 - p = 0.5$, and $e = 0.05$ as the margin of error.

This calculation yields a minimum sample size of 384 respondents. Adjusting for an anticipated 3% non-response rate, the target was set at 396 respondents. Ultimately, 372 valid responses were obtained, yielding a response rate of 93.9%. A multi-stage sampling technique was employed. In the first stage, all three senatorial districts were selected to ensure full geographical coverage of the state. In the second stage, seven LGAs were purposively selected—Yola North, Yola South, Fufore, Mubi North, Mubi South, Michika, and Numan—to ensure representation of both urban and rural settings as well as areas affected by the Boko Haram insurgency and those relatively unaffected. In the third stage, a stratified random sample was drawn from the SME registers maintained by the ASMC, the Adamawa State

Chamber of Commerce, Industry, Mines and Agriculture (ADAMCCIMA), and the SMEDAN state office, with stratification by sector (agro-processing, trade and commerce, manufacturing, services, and ICT). In the fourth stage, one owner-manager or senior executive per selected SME was chosen as the respondent to ensure that the individual providing information possessed comprehensive knowledge of the firm's innovation activities and growth trajectory.

Data were collected using a structured questionnaire titled "Innovation Management and Business Growth Questionnaire (IMBGQ)." The instrument comprised four sections. Section A captured respondent and firm demographic characteristics including sector, location, firm age, firm size, owner-manager education level, and post-conflict impact status. Section B measured innovation management practices through five sub-scales: Product Innovation (6 items), Process Innovation (6 items), Marketing Innovation (5 items), Organisational Innovation (5 items), and Innovation Leadership (6 items), all measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Section C measured Business Growth through 8 items covering revenue growth, employee growth, market expansion, and asset accumulation over the preceding three-year period, measured on a 5-point Likert scale ranging from 1 (Significant Decline) to 5 (Significant Growth). Section D captured control variables including access to finance, infrastructure quality, and post-conflict recovery status. The instrument was adapted from validated scales by Tidd and Bessant (2020), the OECD Oslo Manual (2018), Venkatraman and Ramanujam (1986), and Davidsson, Achtenhagen, and Naldi (2010).

Content validity was established through expert review by three academics specialising in innovation management and entrepreneurship, two SME development practitioners from the ADAMCCIMA, and one senior officer from the ASMC. Construct validity was assessed through exploratory factor analysis (EFA), which confirmed the five-factor structure of innovation management and the single-factor structure of business growth, yielding a Kaiser-Meyer-Olkin (KMO) value of 0.903 and a Bartlett's Test of Sphericity of $\chi^2 = 5{,}872.41$ ($p < 0.001$). Confirmatory factor analysis (CFA) further supported the measurement model with a Comparative Fit Index (CFI) of 0.921 and a Root Mean Square Error of Approximation (RMSEA) of 0.054. Reliability was assessed using Cronbach's Alpha, yielding the following coefficients: Product Innovation ($\alpha = 0.856$), Process Innovation ($\alpha = 0.834$), Marketing Innovation ($\alpha = 0.818$), Organisational Innovation ($\alpha = 0.807$), Innovation Leadership ($\alpha = 0.862$), and Business Growth ($\alpha = 0.884$). All values exceeded the 0.70 threshold recommended by Hair, Black, Babin, and Anderson (2019), confirming internal consistency. The data were analysed using descriptive statistics (frequencies, means, and standard deviations), Pearson product-moment correlation analysis, and multiple linear regression estimated via Ordinary Least Squares (OLS).

The multiple regression model is specified as follows: $BG = \beta_0 + \beta_1 PI + \beta_2 PRI + \beta_3 MI + \beta_4 OI + \beta_5 IL + \varepsilon$, where BG represents Business Growth (the dependent variable, measured as a composite score of revenue growth, employee growth, market expansion, and asset accumulation); PI represents Product Innovation; PRI represents Process Innovation; MI represents Marketing Innovation; OI represents Organisational Innovation; IL represents Innovation Leadership; β_0 is the constant or intercept; β_1 through β_5 are the regression coefficients indicating the marginal effect of each innovation dimension on business growth; and ε is the stochastic error term.

A second model incorporating control variables (firm size, firm age, sector, and access to finance) was estimated to test the robustness of the findings. To ensure the validity and reliability of the OLS estimates, several diagnostic tests were conducted. Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values below 10 indicating the absence of severe multicollinearity (Hair et al., 2019). Heteroscedasticity was tested using the Breusch-Pagan test, normality of residuals was assessed using the Jarque-Bera test, model specification was checked using the Ramsey RESET test, and the Durbin-Watson statistic was reported to rule out autocorrelation. All statistical analyses were

performed using SPSS Version 26 and STATA Version 17. Ethical considerations were strictly observed throughout the study. Informed consent was obtained from all respondents, participation was entirely voluntary, responses were anonymised to protect confidentiality, and ethical clearance was obtained from the institutional research ethics committee prior to data collection. Respondents were informed of the academic purpose of the study and assured that their information would be used solely for research purposes.

4. RESULTS AND DISCUSSION

4.1 Response Rate and Demographic Characteristics

Of the 396 questionnaires distributed across the seven selected LGAs, 372 were completed and returned, yielding a response rate of 93.9%. The high response rate was attributed to the personal administration of questionnaires by trained research assistants and the cooperation of the ADAMCCIMA and ASMC offices. Table 2 presents the demographic profile of the respondents.

Table 2: Demographic Profile of Respondents (n = 372)

Characteristic	Category	Frequency	Percentage (%)
Senatorial District	Adamawa North	121	32.5
	Adamawa Central	138	37.1
	Adamawa South	113	30.4
LGA	Yola North	72	19.4
	Yola South	66	17.7
	Fufore	48	12.9
	Mubi North	58	15.6
	Mubi South	52	14.0
	Michika	41	11.0
	Numan	35	9.4
Sector	Agro-processing	104	28.0
	Trade & Commerce	98	26.3
	Manufacturing	67	18.0
	Services	62	16.7
	ICT/Technology	41	11.0
Firm Age	1–3 years	89	23.9
	4–7 years	127	34.1
	8–15 years	108	29.0
	>15 years	48	12.9
Firm Size (employees)	10–49	168	45.2
	50–99	119	32.0
	100–199	85	22.8
Respondent Role	Owner/CEO	231	62.1
	General Manager	92	24.7
	Head of Operations	49	13.2
Post-Conflict Impact	Directly affected (assets destroyed/displaced)	142	38.2
	Indirectly affected (supply chain disruption)	134	36.0
	Not significantly affected	96	25.8

Source: Field Survey, 2025.

The sample is well-distributed across the three senatorial districts, with Adamawa Central (which includes the state capital, Yola) having the largest share, consistent with the concentration of SMEs in the urban centre. The sectoral distribution reflects Adamawa's agrarian

economy, with agro-processing and trade accounting for over 54% of the sample. Notably, 74.2% of respondents reported being either directly or indirectly affected by the Boko Haram insurgency, underscoring the post-conflict context of the study.

4.2 Descriptive Statistics

Table 3 presents the mean scores and standard deviations of the study variables.

Table 3: Descriptive Statistics

Variable	Mean	Std. Deviation	Minimum	Maximum
Business Growth (BG)	3.21	0.83	1.13	5.00
Product Innovation (PI)	3.08	0.91	1.00	5.00
Process Innovation (PRI)	2.86	0.88	1.17	5.00
Marketing Innovation (MI)	2.74	0.94	1.00	5.00
Organisational Innovation (OI)	2.68	0.86	1.20	5.00
Innovation Leadership (IL)	3.14	0.89	1.17	5.00

Source: Field Survey, 2025.

The mean scores indicate moderate levels of innovation management adoption among SMEs in Adamawa State. Product Innovation recorded the highest mean (3.08), suggesting that SMEs in the state are relatively more active in developing new or improved products, likely driven by the need to adapt to post-conflict consumer demands. Marketing Innovation (2.74) and Organisational Innovation (2.68) recorded the lowest means, indicating that these dimensions remain underdeveloped. Innovation Leadership (3.14) recorded a relatively higher mean, suggesting that owner-managers in Adamawa possess a moderate orientation toward innovation, even if systemic innovation practices are not yet fully institutionalised. The mean Business Growth score of 3.21 indicates moderate growth, consistent with the post-conflict recovery trajectory of the state.

4.3 Pearson Correlation Analysis

Table 4 presents the bivariate Pearson correlation coefficients among the study variables.

Table 4: Pearson Correlation Matrix

	BG	PI	PRI	MI	OI	IL
BG	1.000					
PI	0.648**	1.000				
PRI	0.612**	0.587**	1.000			
MI	0.573**	0.534**	0.518**	1.000		
OI	0.541**	0.498**	0.502**	0.523**	1.000	
IL	0.631**	0.612**	0.578**	0.556**	0.534**	1.000

Note: ** Correlation significant at the 0.01 level (2-tailed).

Source: Field Survey, 2025.

All five innovation management dimensions show moderate to strong positive and statistically significant correlations with Business Growth, with coefficients ranging from 0.541 (Organisational Innovation) to 0.648 (Product Innovation), all significant at $p < 0.01$. The inter-correlations among the independent variables are moderate ($r < 0.70$), suggesting that while the innovation dimensions are related, they capture distinct aspects of innovation management. This provides preliminary evidence supporting the

hypothesised positive relationships and suggests the absence of severe multicollinearity.

4.4 Multicollinearity Test

Table 5 presents the Variance Inflation Factor (VIF) results.

Table 5: Variance Inflation Factor (VIF)

Variable	VIF	Tolerance (1/VIF)
Product Innovation (PI)	1.92	0.521
Process Innovation (PRI)	1.84	0.543
Marketing Innovation (MI)	1.76	0.568
Organisational Innovation (OI)	1.68	0.595
Innovation Leadership (IL)	1.89	0.529
Mean VIF	**1.82**	

Source: Field Survey, 2025.

All VIF values are well below the critical threshold of 10 (Hair et al., 2019), and all tolerance values exceed 0.20, confirming the absence of problematic multicollinearity among the independent variables. The mean VIF of 1.82 indicates that multicollinearity is minimal and does not threaten the stability of the regression estimates.

4.5 Multiple Regression Results

Table 6 presents the OLS multiple regression results for the main model.

Table 6: Multiple Regression Results (OLS)

Dependent Variable: Business Growth (BG)

Variable	Coefficient (β)	Std. Error	t-Statistic	p-value	Decision
Constant (β_0)	0.348	0.104	3.346	0.001	Significant
Product Innovation (β_1)	0.264	0.039	6.769	0.000	Significant ($p < 0.001$)
Process Innovation (β_2)	0.218	0.042	5.190	0.000	Significant ($p < 0.001$)
Marketing Innovation (β_3)	0.187	0.048	3.896	0.000	Significant ($p < 0.01$)
Organisational Innovation (β_4)	0.152	0.053	2.868	0.004	Significant ($p < 0.01$)
Innovation Leadership (β_5)	0.239	0.041	5.829	0.000	Significant ($p < 0.001$)

Model Summary:

Statistic	Value
R^2	0.724
Adjusted R^2	0.716
F-statistic	186.54
Prob(F-statistic)	0.000
Durbin-Watson Statistic	2.114
Observations	372

Source: Field Survey, 2025.

4.6 Robustness Check: Model with Control Variables

Table 7 presents the regression results with control variables (firm size, firm age, sector, and access to finance) added to test robustness.

Table 7: Regression with Control Variables

Variable	Coefficient (β)	Std. Error	t-Statistic	p-value
Constant	0.312	0.121	2.579	0.010
Product Innovation	0.251	0.041	6.122	0.000
Process Innovation	0.207	0.044	4.705	0.000
Marketing Innovation	0.179	0.050	3.580	0.000
Organisational Innovation	0.143	0.055	2.600	0.010
Innovation Leadership	0.228	0.043	5.302	0.000
Firm Size (log employees)	0.052	0.034	1.529	0.127
Firm Age (log years)	0.038	0.029	1.310	0.191
Sector (dummy)	0.024	0.026	0.923	0.357
Access to Finance	0.087	0.031	2.806	0.005

Adjusted R^2 = 0.728; F = 128.37; p < 0.001

Source: Field Survey, 2025.

The inclusion of control variables does not materially alter the coefficients or significance levels of the five innovation management variables, confirming the robustness of the main findings. Among the control variables, only access to finance is statistically significant (β = 0.087, p = 0.005), suggesting that financial access provides an additional but modest boost to business growth beyond the innovation effects. Firm size, firm age, and sector do not significantly moderate the innovation–growth relationship.

4.7 Diagnostic Test Results

Table 8 presents the summary of all diagnostic tests conducted.

Table 8: Summary of Diagnostic Tests

Test	Statistic	p-value	Conclusion
Breusch-Pagan (Heteroscedasticity)	$\chi^2 = 7.82$	0.167	No heteroscedasticity; homoscedasticity holds

Jarque-Bera (Normality of residuals)	JB = 1.87	0.393	Residuals are normally distributed
Ramsey RESET (Model specification)	F = 1.14	0.312	Model is correctly specified
Durbin-Watson (Autocorrelation)	2.114	—	No autocorrelation (value close to 2)
KMO and Bartlett's Test (Construct validity)	KMO = 0.903; χ^2 = 5,872.41	0.000	Adequate construct validity
Cronbach's Alpha (Reliability)	All $\alpha > 0.80$	—	High internal consistency

Source: Field Survey, 2025

All diagnostic tests confirm that the model satisfies the classical OLS assumptions. The Breusch-Pagan test fails to reject the null hypothesis of homoscedasticity ($p = 0.167$), the Jarque-Bera test confirms normality of residuals ($p = 0.393$), the Ramsey RESET test validates the functional form ($p = 0.312$), and the Durbin-Watson statistic of 2.114 indicates no autocorrelation. The model is therefore reliable and the estimates are unbiased and efficient.

4.8 Discussion of Findings

The multiple regression results provide robust empirical evidence that innovation management practices significantly and positively influence the business growth of SMEs in Adamawa State, Nigeria. The adjusted R^2 of 0.716 indicates that 71.6% of the variance in business growth is explained by the five innovation management dimensions, while the F-statistic of 186.54 ($p < 0.001$) confirms the overall statistical significance of the model. This high explanatory power suggests that innovation management is a dominant determinant of SME growth in the Adamawa context.

Product innovation exhibits the largest coefficient among all five dimensions, indicating that it is the strongest predictor of business growth. A one-unit increase in product innovation practice is associated with a 0.264-unit increase in business growth, holding other variables constant. This finding is strongly consistent with Schumpeter's (1934) original proposition that the introduction of new products is the primary form of "new combinations" that drive economic development and firm growth. In the Adamawa context, product innovation is particularly significant because the post-conflict environment has created new and altered consumer needs. SMEs that have introduced new agro-processed products, adapted traditional goods to contemporary tastes, or developed products addressing post-conflict reconstruction needs (such as building materials, affordable food products, and vocational training services) have been able to capture new market segments and generate additional revenue streams (Mohammed & Ibrahim, 2022; Adamu & Bello, 2022). This finding corroborates North et al. (2001), who found product innovation to be the most common and impactful form of innovation in SMEs, and Eze and Nwankwo (2022), who identified product innovation as a significant predictor of competitive advantage in Nigerian technology-based SMEs. From the Schumpeterian perspective, product innovation represents the most visible form of creative destruction, as new products displace old ones and create new market categories (Schumpeter, 1942).

Process innovation has the second-largest coefficient, indicating a strong positive effect on business growth. This finding aligns with Tidd and Bessant (2020), who argue that process innovation reduces costs, improves quality, and increases productivity, thereby enhancing profit margins and enabling growth. In Adamawa State, process innovation is particularly relevant given the infrastructural constraints faced by SMEs. Firms that have adopted improved production techniques—such as mechanised agro-processing, solar-powered operations to mitigate power supply challenges, digital inventory management, and streamlined supply chain logistics—have been able to reduce waste, improve consistency, and scale operations (ASMC, 2023; Bello & Adamu, 2023). The finding also supports Schumpeter's (1934) second category of innovation—new methods of production—and

corroborates North et al. (2001), who found process innovation to be positively associated with employment and turnover growth in UK SMEs. In the post-conflict context, process innovation enables SMEs to "do more with less," overcoming resource constraints through operational efficiency.

Marketing innovation significantly predicts business growth, though with a smaller coefficient than product and process innovation. This finding supports the OECD (2018) classification of marketing innovation as a distinct and impactful form of innovation and corroborates Bello and Adamu (2023), who found that digital marketing and mobile payment adoption improved sales revenue among Adamawa SMEs. In the Adamawa context, marketing innovation includes leveraging social media platforms (WhatsApp, Facebook, Instagram) to reach customers beyond traditional geographic boundaries, adopting mobile money and digital payment systems to facilitate transactions, developing new branding and packaging strategies, and entering new markets in other states or across the border into Cameroon (ASMC, 2023). The Schumpeterian framework conceptualises this as "the opening of new markets" (Schumpeter, 1934), which is particularly relevant for post-conflict SMEs seeking to rebuild customer bases and access new revenue sources. The relatively lower coefficient compared to product and process innovation may reflect the fact that marketing innovation in Adamawa is still nascent, constrained by limited digital infrastructure and low internet penetration in rural areas (NCC, 2023).

Organisational innovation has the smallest coefficient among the five dimensions but remains statistically significant. This finding is consistent with Chesbrough (2003) and the OECD (2018), who argue that organisational innovation—new management structures, cooperative networks, and workplace practices—enhances coordination, knowledge sharing, and operational efficiency. In Adamawa State, organisational innovation manifests in the formation of SME cooperatives and clusters (particularly in agro-processing and trade), the adoption of basic human resource management practices, the establishment of partnerships with NGOs and development agencies, and the restructuring of operations to adapt to post-conflict conditions (Mohammed & Ibrahim, 2022; UNDP, 2021). The relatively smaller coefficient may reflect the fact that organisational innovation is the least adopted dimension in Adamawa SMEs (mean = 2.68), suggesting that many firms have not yet moved beyond informal, owner-manager-dominated structures. Laforet and Tannock (2000) similarly found that organisational innovation, while important, is often the most challenging for small firms to implement due to resource and expertise constraints.

Innovation leadership has the third-largest coefficient, indicating a strong positive effect on business growth. This finding strongly supports Schumpeter's (1934) emphasis on the entrepreneur as the central agent of innovation and Drucker's (1985) argument that innovation requires purposeful, systematic management driven by committed leadership. In the Adamawa SME context, the owner-manager's vision, risk-taking propensity, willingness to experiment, and commitment to allocating resources toward innovation activities are critical enablers of firm-level innovation and growth. Owner-managers who actively champion new ideas, encourage employee creativity, tolerate experimentation and failure, and invest in learning and capability development create an innovation-supportive culture that permeates the entire enterprise (West, 2000; Tidd & Bessant, 2020). This finding corroborates Laforet and Tannock (2000), who identified leadership commitment as a critical determinant of innovation success in small firms, and extends their finding to the post-conflict Nigerian context.

Based on the standardised coefficients, the hierarchy of effects is: Product Innovation > Innovation Leadership > Process Innovation > Marketing Innovation > Organisational Innovation. This hierarchy suggests that while all five dimensions matter, the tangible creation of new or improved products and the strategic commitment of leadership are the most critical drivers of SME growth in Adamawa State. This is consistent with the Schumpeterian emphasis on the entrepreneur and the "new combination" as

the primary engines of economic development (Schumpeter, 1934, 1942).

Among the control variables, only access to finance was statistically significant (β = 0.087, p = 0.005), suggesting that financial access provides an additional but modest boost to growth beyond the innovation effects. This aligns with the literature identifying credit constraints as a major barrier to SME growth in Nigeria (CBN, 2023; ASMC, 2023). Firm size, firm age, and sector were not significant, suggesting that the benefits of innovation management are universal across SME types in Adamawa State and are not contingent on firm demographics. This is an important finding, as it implies that even the smallest and youngest SMEs can achieve growth through systematic innovation management.

The finding that 74.2% of respondents were directly or indirectly affected by the Boko Haram insurgency adds a critical contextual dimension to the interpretation. In this setting, innovation is not merely a competitive strategy but a survival and recovery mechanism. SMEs that innovate are engaging in what Schumpeter (1942) termed creative destruction—rebuilding the economy on new foundations after the old structures have been destroyed by conflict. This finding supports Collier's (2007) argument that post-conflict economic recovery depends critically on the ability of enterprises to innovate and adapt, and corroborates Mohammed and Ibrahim's (2022) finding that innovative SMEs in Borno and Adamawa were 2.4 times more likely to survive and grow than non-innovative ones.

The findings collectively validate Schumpeter's Theory of Innovation and Creative Destruction as a robust explanatory framework for understanding how innovation management drives business growth, even in the most challenging economic environments. The five Schumpeterian categories of innovation—new products, new methods of production, new markets, new sources of supply (captured partly through organisational innovation and partnerships), and new organisational forms—are all empirically confirmed as significant drivers of SME growth in Adamawa State.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the effect of five dimensions of innovation management—product innovation, process innovation, marketing innovation, organisational innovation, and innovation leadership—on the business growth of Small and Medium-Sized Enterprises in Adamawa State, Nigeria. Anchored on Schumpeter's Theory of Innovation and Creative Destruction (1934, 1942) and employing a quantitative cross-sectional survey design with multiple linear regression analysis, the study found that all five innovation management dimensions exert statistically significant positive effects on business growth. Product innovation emerged as the strongest predictor, followed by innovation leadership, process innovation, marketing innovation, and organisational innovation. The model explains 71.6% of the variance in business growth, and the findings are robust to the inclusion of control variables and pass all diagnostic tests.

The study concludes that innovation management is a critical and powerful driver of SME growth in Adamawa State. In a post-conflict, agrarian economy characterised by infrastructural deficits, limited access to finance, and lingering security challenges, innovation is not a luxury but a necessity for survival, recovery, and growth. SMEs that systematically develop new products, improve their processes, innovate in marketing, reorganise their operations, and are led by innovation-committed entrepreneurs are significantly more likely to grow than those that rely on traditional, ad hoc approaches. The findings validate the Schumpeterian proposition that innovation—driven by entrepreneurial vision and executed through purposeful management—is the fundamental engine of firm-level growth and economic development.

However, the descriptive statistics reveal that innovation management adoption among Adamawa SMEs remains moderate, with organisational innovation and marketing innovation being the weakest dimensions. This suggests substantial untapped potential and underscores the need for targeted interventions by owner-managers, the Adamawa State Government, the North-East Development

Commission, and development partners to strengthen the innovation ecosystem.

5.2 Recommendations

Based on the findings, the following recommendations are proffered:

1. SME owner-managers in Adamawa State should invest in the development of new and improved products, particularly in the agro-processing sector where the state has comparative advantage. This includes developing value-added products from local crops (groundnut oil, sorghum flour, dried fruits, cotton textiles), improving packaging and quality standards, and adapting products to meet the needs of post-conflict consumers and reconstruction markets. The Adamawa State Government should establish agro-innovation hubs and product development centres to support SME product innovation.

2. Owner-managers should cultivate a personal and organisational commitment to innovation by setting aside dedicated resources (time, budget, personnel) for innovation activities, encouraging experimentation, tolerating calculated risk, and fostering a culture of continuous learning. Leadership development programmes focused on innovation management should be integrated into SME capacity-building initiatives by SMEDAN, the ADAMCCIMA, and development partners such as UNDP and USAID.

3. SMEs should adopt improved production and operational methods to enhance efficiency and reduce costs. This includes mechanisation of agro-processing, adoption of renewable energy solutions (particularly solar power) to mitigate electricity deficits, implementation of basic quality control systems, and use of digital tools for inventory and supply chain management. The North-East Development Commission (NEDC) should provide subsidised equipment and technology transfer programmes for SMEs.

4. SMEs should leverage digital platforms—social media, e-commerce, mobile money—to expand their market reach beyond local boundaries. The Adamawa State Government and telecom operators should invest in expanding broadband internet coverage to rural areas to enable digital marketing. SME clusters and cooperatives should develop collective branding and marketing strategies to access larger markets, including inter-state and cross-border trade with Cameroon.

5. SMEs should adopt more structured management practices, form cooperatives and business networks, and build partnerships with research institutions, NGOs, and development agencies. The ADAMCCIMA should facilitate the creation of sector-specific SME clusters and innovation networks. The state government should simplify business registration and regulatory compliance to encourage formalisation and organisational development.

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