Effects of Boko Haram Insurgency Proxies on The Performance of Small and Medium Enterprises in Adamawa State, Nigeria

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https://doi.org/10.56201/ijssmr.vol.12no11.2026.pg238.245

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Abstract
Small and Medium Enterprises (SMEs) are central to employment and economic growth in Nigeria, yet those operating in the Northern Senatorial Zone of Adamawa State have endured more than a decade of Boko Haram violence. This article examines the direct effects of four insurgency-related operational stressors, namely business displacement and forced relocation, operational hour restrictions and curfews, supply chain and logistics disruption, and workforce shortage and employee absenteeism, on SME performance in Madagali, Michika, Mubi North, Mubi South and Maiha Local Government Areas. The study adopted a pragmatist philosophy and a cross-sectional explanatory quantitative design. Using a near-census approach, 297 of 300 registered SMEs (99% response rate) completed a structured questionnaire administered face to face, and 293 cases were retained after multivariate outlier screening. Data were analysed with Partial Least Squares Structural Equation Modelling (SmartPLS 4.0) using bootstrapping with 5,000 resamples. The model explained 77.9% of the variance in SME performance ($R^2 = 0.779$). Contrary to the hypothesised negative relationships, business displacement ($\beta = 0.128$, $p = 0.016$) and operational hour restrictions ($\beta = 0.174$, $p = 0.010$) showed small positive associations with performance, while supply chain disruption ($\beta = 0.060$, $p = 0.257$) and workforce shortage ($\beta = 0.091$, $p = 0.171$) were not significant. Strategic flexibility, included in the model as a capability variable, had a large positive effect ($\beta = 0.542$, $p < 0.001$, $f^2 = 0.434$). The article argues that these results should be read as associations among surviving firms in a cross-sectional sample, not as evidence that insurgency improves business performance, and that firm-level capability matters more for performance than the measured intensity of any single stressor. Implications for SME owners, policymakers and development partners are discussed.

Keywords: *Boko Haram insurgency; SME performance; business displacement; curfews; supply chain disruption; workforce shortage; Adamawa State; PLS-SEM.*

1. Introduction

SMEs represent roughly 90% of businesses and over 50% of employment worldwide (World Bank, 2024), and an estimated 80% of businesses in Africa (Tambunan, 2019). Their operating environment, however, is increasingly turbulent. Armed conflict and insurgency damage

infrastructure, undermine consumer confidence and fracture supply chains, and small firms with thin asset bases and limited access to credit are among the least able to absorb such shocks (Naradda Gamage *et al.,* 2019; Asgary *et al.,* 2020; African Development Bank, 2023). Nigeria reflects these vulnerabilities in an intensified form. SMEs account for about 96% of established businesses and over 48% of Gross Domestic Product (SMEDAN & NBS, 2021). Since its violent escalation in 2009, the Boko Haram insurgency has displaced more than 2.5 million people and caused institutional losses exceeding $9 billion across the North-East (World Bank, 2022). For SMEs, the insurgency operates through four connected stressors: forced displacement of businesses, curfews and restrictions on operating hours, disruption of supply chains and logistics, and shortages of labour caused by absenteeism, flight and trauma. Adamawa State, which borders Cameroon, has been especially affected in its Northern Senatorial Zone (Madagali, Michika, Mubi North, Mubi South and Maiha). Local cultivated land is reported to have fallen by 47% during peak conflict, and the price of sorghum rose by 180% (Abubakar *et al.,* 2023; World Bank, 2022). Some 72% of conflict-affected households and small businesses reported losing productive assets without compensation (IPC, 2023), and more than 40% of micro, small and medium enterprises in northern Nigeria faced closure or severe downsizing (SMEDAN & NBS, 2021; Asogwa *et al.,* 2022). Existing studies document the damage the insurgency has done to the economy of the Lake Chad Basin and to SMEs, but they are largely descriptive or aggregate in focus (Foyou *et al.,* 2018; Asogwa *et al.,* 2022; Abubakar *et al.,* 2023). Prior firm-level work in Adamawa has addressed individual stressors such as transport costs or curfews, rather than testing the four stressors together in a single multivariate model (Abubakar *et al.,* 2023; Inuwa & Muhammad, 2019). The literature also overwhelmingly assumes that each stressor depresses performance. Whether that assumption holds among SMEs that have survived in the Northern Zone is an empirical question that has not been tested with a validated multi-item instrument.

This article therefore addresses the question: *What is the direct effect of each of four Boko Haram insurgency proxies on the performance of SMEs in the Northern Zone of Adamawa State?*

The aim of this article is to examine the direct effects of Boko Haram insurgency proxies on SME performance in the Northern Zone of Adamawa State. The specific objectives are to examine the effect of business displacement and forced relocation on SME performance, examine the effect of operational hour restrictions and curfews on SME performance, evaluate the effect of supply chain and logistics disruption on SME performance and finally to assess the effect of workforce shortage and employee absenteeism on SME performance. In line with the literature reviewed below, the study hypothesized that each proxy has a significant negative effect on SME performance: H1: Business displacement and forced relocation have a significant negative effect on SME performance, H2: Operational hour restrictions and curfews have a significant negative effect on SME performance, H3: Supply chain and logistics disruption have a significant negative effect on SME performance and H4: Workforce shortage and employee absenteeism have a significant negative effect on SME performance.

The study contributes a multidimensional measure of insurgency exposure for firm-level research, in place of the single-item or aggregate indicators used earlier (Foyou *et al.,* 2018; World Bank, 2022). It supplies micro-level evidence from five Local Government Areas that are poorly represented in the literature. For SME owners, development agencies and financial institutions, it indicates which stressors show measurable associations with performance and which do not. For policymakers and security agencies, it informs discussion of the secondary economic effects of curfews and movement restrictions.

SMEs in conflict zones face direct asset destruction, extortion, market closures and the loss of skilled labour, and unlike multinational firms they rarely hold geographically diversified portfolios or contingency reserves (Asgary *et al.,* 2020; Tambunan, 2019). Performance in such settings is usually assessed through sales growth, profitability, customer retention and asset preservation (Asogwa *et al.,* 2022; Inuwa & Muhammad, 2019). Displacement destroys location-specific goodwill, severs customer and supplier relationships and imposes relocation costs. Abdulazeez et al. (2025) report average revenue reductions of 52% among 150 SMEs in the Northern Zone, while Eze et al. (2024), tracking 5,000 Nigerian SMEs from 2016 to 2023, identify displacement as the strongest predictor of permanent closure. Inuwa and Muhammad (2021) report that each forced relocation of an Adamawa SME was associated with a sharp rise in operating costs and a fall in net profit margins. The literature therefore predicts a negative effect. Curfews are necessary counter-insurgency measures but they compress trading windows. Abdulazeez et al. (2025) report that curfews cut SME trading time by up to 40% in the Northern Zone, and Inuwa and Muhammad (2021) find larger revenue losses in the more strictly policed Northern Zone than in the Central and Southern zones. Eze et al. (2024) link curfews to higher spoilage and reduced foot traffic among retailers. Retail and hospitality firms are generally reported as most exposed.

Abubakar et al. (2023) report that transport costs for Adamawa SMEs rose by an average of 210% between 2014 and 2023, with unpredictable delivery lead times. Abdulazeez et al. (2025) find that supply chain disruption explained more variance in sales decline than the other proxies in their sample, and the review of Naradda Gamage et al. (2021) across 45 countries ranks it among the strongest predictors of SME decline during crises. Eze et al. (2024) report that 22% of employees tracked in Adamawa SMEs left their jobs permanently for insurgency-related reasons, with further absenteeism and elevated psychological distress reducing output. Okoro and Eze (2023) describe a skills-flight spiral in which the departure of educated workers increases the burden on those who remain. Prior studies consistently point to negative effects, but they differ in samples and methods, are often based on single-stressor designs, and may over-represent firms that have already failed or been displaced. No study known to the authors tests all four stressors simultaneously in a validated PLS-SEM model for the five Northern Zone LGAs. This article addresses that gap.

The study draws primarily on Dynamic Capabilities Theory (DCT), which explains how firms sense, seize and transform in rapidly changing environments (Teece *et al.,* 1997; Teece, 2007, 2018). Strategic flexibility, the capacity to redeploy resources and reconfigure operations quickly, is treated as a dynamic capability comprising resource flexibility and coordination flexibility (Sanchez, 1995; Zhou & Wu, 2010). Contingency Theory adds that the value of any capability depends on the fit between a firm and its environment (Lawrence & Lorsch, 1967; Donaldson, 2001). The Resource-Based View (Barney, 1991) is used as a contrast because its focus on resource possession fits poorly where assets are destroyed or displaced, and organisational resilience theory (Duchek, 2020) is used to distinguish "bouncing back" from the "bouncing forward" that flexibility implies. The conceptual model for this article links four exogenous variables (displacement, curfews, supply chain disruption and workforce shortage) to SME performance, with strategic flexibility included as a capability variable. The theory predicts negative effects of stressors; the results below test that prediction.

2. Methodology

The study adopted pragmatism, which allows the research problem to drive method choice in unstable, low-trust settings (Morgan, 2014; Saunders *et al.,* 2019), and a cross-sectional explanatory quantitative design. A single point-in-time design was chosen because security

conditions, and closure and displacement rates exceeding 40%, made longitudinal fieldwork unsafe and attrition-prone. The population comprised registered SMEs in the five LGAs meeting four criteria: registration with SMEDAN or the Corporate Affairs Commission; small (10–49 employees) or medium (50–199 employees) size under SMEDAN/NBS (2021) criteria; at least 12 months of operation; and fixed premises.

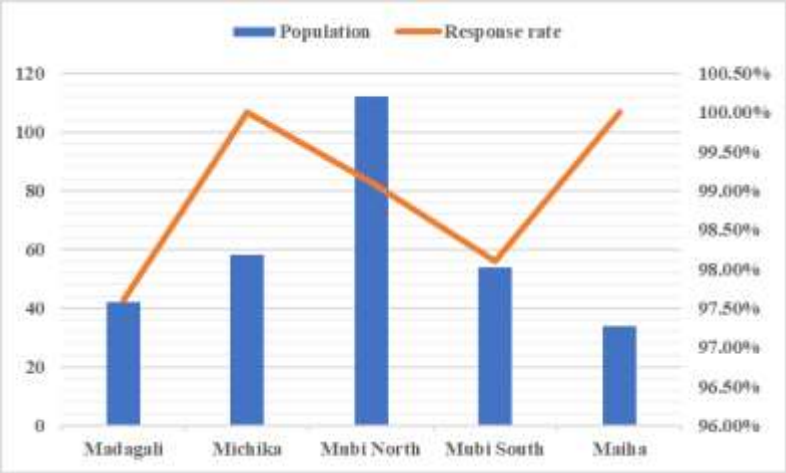

Figure 1. The population of the study

Source: Field survey (2026).

By sector, the sample comprised retail trade (33.0%), services (22.6%), agriculture and agribusiness (18.2%), manufacturing (14.1%) and transport and logistics (12.1%).

Content validity was established through review by five experts and Lawshe's (1975) Content Validity Ratio, followed by a pilot of 30 SMEs excluded from the main sample. Exploratory factor analysis (KMO = 0.874; Bartlett's test $p < 0.001$) extracted four insurgency factors explaining 68.4% of variance. Harman's single-factor test showed that one factor explained 28.6% of variance, below the 50% threshold (Podsakoff *et al.,* 2003). Data were analysed with SmartPLS 4.0 in two stages (Hair *et al.,* 2017, 2019): measurement model assessment (loadings, Cronbach's alpha, composite reliability, AVE, Fornell–Larcker and HTMT) and structural model assessment (path coefficients by bootstrapping with 5,000 resamples, R^2, f^2, Q^2 and SRMR) at $p < 0.05$.

3. Results and Discussion

3.1 Results

Missing data were under 1% and random (Little's MCAR $p = 0.32$). Four multivariate outliers (Mahalanobis D^2 above 29.59) were deleted, leaving 293 cases. VIF values were all below 3.45 and tolerance above 0.29, so multicollinearity was not a concern, and the Durbin–Watson statistic was 1.87. Most indicator loadings exceeded 0.70; three were lower (BD1 = 0.511, WF1 = 0.660, PERF9 = 0.683) and were retained for content validity. Cronbach's alpha ranged from 0.763 (displacement) to 0.912 (performance), composite reliability (ρc) from 0.840 to 0.926, and AVE from 0.517 to 0.623, all above conventional thresholds. Discriminant validity was only partly established. The correlation between displacement and curfews (0.782) exceeded the square root of the displacement AVE (0.719), and HTMT values for curfews–displacement (0.891) and curfews–performance (0.884) exceeded 0.85. Because the four proxies measure facets of one phenomenon, some overlap is expected, but the positive coefficients reported below should be read with this overlap in mind. The model explained 77.9% of the variance in SME performance (R^2 =

0.779; adjusted R^2 = 0.772), had predictive relevance (Q^2 = 0.749) and acceptable fit (SRMR = 0.065).

3.2 Discussion of Findings

The positive coefficient contradicts the negative effect reported in earlier studies (Abdulazeez *et al.,* 2025; Eze *et al.,* 2024). Two explanations are plausible. Displaced firms may have moved to more commercially viable locations with better market access, and the sample consists of firms that survived displacement, so those most harmed may have closed and left the sampling frame (survivorship bias; Eze *et al.,* 2024). The effect size is small (f^2 = 0.033). The positive coefficient may reflect adaptation, as firms that shifted to delivery, mobile commerce or digital transactions opened new revenue streams (Inuwa & Muhammad, 2019). Again the effect is small (f^2 = 0.031), and the high overlap of curfews with displacement and performance in the discriminant validity tests counsels caution.

Neither had a significant direct effect despite high mean exposure, which departs from studies that identified them as leading predictors of decline (Abubakar *et al.,* 2023; Asogwa *et al.,* 2022). The inclusion of a strong capability variable in the model, differences in sample composition, and the cross-sectional, self-reported measurement of performance may each contribute. The dominant predictor of performance was strategic flexibility (β = 0.542, f^2 = 0.434), consistent with DCT and with studies of flexibility in crises (Teece *et al.,* 1997; Pathak *et al.,* 2024). Firms able to switch suppliers, redeploy staff, use digital channels and relocate temporarily reported substantially higher performance. Because the design is cross-sectional and the data are self-reported by single informants, these are associations, not causal effects. The positive coefficients for displacement and curfews do not indicate that insurgency benefits SMEs; they indicate that, among firms still operating in 2026, higher reported exposure was not accompanied by lower reported performance once flexibility was taken into account.

4. Conclusion

The direct effects of insurgency proxies on SME performance in Northern Adamawa are not uniformly negative. Displacement and curfews showed small positive associations with performance, supply chain disruption and workforce shortage showed none, and strategic flexibility was by far the strongest correlate of performance. Prior assumptions of a simple negative linear relationship are therefore not supported among surviving firms, and firm-level capability appears more consequential than the intensity of any single stressor.

Base on the findings of the study, some recommendations were made as follows:

1. SME owners should hold modular, mobile assets, pre-identify an alternative safe premise and keep a written relocation plan (for displacement).
2. SME owners should invest in digital commerce, including point-of-sale and mobile payments, messaging-based ordering and doorstep delivery, so that trade continues beyond curfew-limited hours.
3. SME owners should keep two to three backup suppliers across different corridors and hold small safety stocks of critical inputs.
4. SME owners should cross-train staff so that each employee can perform at least two roles, and introduce flexible shift arrangements.
5. Government, security agencies and development partners should consider differentiated curfew arrangements or secure trading windows for essential SME supply chains, secure transport corridors, and psychosocial support for affected workers.

6. Financial institutions and SMEDAN should consider including flexibility indicators in SME appraisal and training programmes.

The study is cross-sectional, relies on self-reported data from single respondents, excludes micro-enterprises, is confined to five LGAs and drew on a constructed sampling frame. Discriminant validity between the insurgency proxies was only partly established, and the direct-effect estimates are from a model that also contains the moderator and interaction terms. Future studies should use longitudinal or quasi-experimental designs that include firms that closed, add objective performance data and multiple respondents, replicate the study in Borno and Yobe, include micro-enterprises, and test mediating mechanisms such as customer retention and cost reduction.

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