

Insecurity and tourism SME performance in Jos Metropolis: Evidence from a mixed-methods analysis

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Abstract - Tourism-dependent businesses and small- and medium-sized enterprises (SMEs) in emerging destinations are highly vulnerable to insecurity. This study quantifies the effects of insecurity-related mechanisms on business income among tourism-related businesses in Jos Metropolis, Plateau State, using primary field data collected in 2025. A cross-sectional survey of tourism and hospitality operators and proprietors of tourism-related businesses was analysed using multiple linear regression. Predictor variables captured insecurity pathways: decline in customer patronage, perceived seriousness of insecurity, business disruptions, effects on investment and expansion, government support, and adoption of business innovations. Semi-structured interviews with stakeholders triangulated quantitative findings. Results showed the model explaining 16.4% of the variation in business income ($R^2 = 0.164$) and was statistically significant ($F = 5.236, p < 0.05$). Decline in customer patronage due to insecurity was the only statistically significant predictor of income loss ($B = 0.357$; $\text{Beta} = 0.354$; $t = 4.856$; $p < 0.001$). Other predictors were not significant. Qualitative evidence indicates that visible security incidents, negative media coverage, and travel advisories reduce visitor flows and directly depress revenues for hotels, restaurants, transport operators, event centres, and recreational facilities. Tourism-related businesses adopt coping strategies that mitigate immediate losses but do not restore lost tourist demand. It can be concluded that sustained insecurity undermines tourism-related businesses' viability primarily through reduced patronage. Policy responses must prioritize targeted security improvements, accessible institutional support, and coordinated destination-image restoration paired with market-access innovations for the businesses.

Keywords: tourism, tourism-related businesses, jos metropolis, tourism resilience, destination security, economic sustainability

1. Introduction

Tourism is a critical source of employment, income, and local economic diversification in many urban and semi-urban settings. In destinations where tourism is a significant economic activity, tourism-related businesses such as hotels, restaurants, transport providers, event organizers, and craft vendors depend on tourist flows. Tourism is widely recognized as a major driver of socio-economic development, especially in developing countries, where it significantly boosts gross domestic product (GDP), generates employment, builds infrastructure, and fosters cultural exchange (UNWTO, 2022). Security conditions, therefore, play a central role in shaping tourism demand and the economic performance of tourism-related businesses. Jos, in Plateau State, Nigeria, has experienced recurrent insecurity that has affected its reputation and tourist inflows. This paper examines how insecurity affects business income among tourism-related businesses



in Jos Metropolis, using regression analysis of field-survey data collected in 2025 and qualitative interviews to contextualize findings.

Tourism demand is sensitive to both perceived and actual risks; tourists are risk-averse and often avoid destinations perceived as unsafe. Destination image and media framing mediate the relationship between incidents and demand, with reputational damage often persisting beyond the resolution of specific events.

Insecurity has become a major development challenge in Nigeria, with far-reaching implications for socio-economic development, including tourism. Insecurity is broadly defined as a lack of safety, protection, or freedom from threats. In the Nigerian context, it includes both physical dangers, such as terrorism and theft, and emotional risks like anxiety and fear, which can negatively impact people's willingness to travel or participate in tourism (Ngozi& Emmanuella, 2017).

Adebayo (2022) states that insecurity refers to a situation in which the human and national security of a state is compromised by internal or external forces, resulting in fear, instability, and threats to lives and property. This definition highlights the breakdown of law and order and the inability of the state to adequately protect the lives and assets of its citizens. It creates an atmosphere of fear and uncertainty, discouraging investment, restricting mobility, and disrupting normal economic activities. In the context of tourism, insecurity undermines destination attractiveness, reduces tourist arrivals, and negatively affects tourism-dependent livelihoods. It is a complex problem that not only discourages visitors but also erodes confidence in the government institutions responsible for ensuring security.

Tourism is not limited to activities in the accommodation and hospitality sector, the transportation sector, and the entertainment sector, with visitor attractions such as amusement parks, sports facilities, and museums alone, tourism and its management are closely connected to all major functions, processes and procedures that are practiced in various areas related to tourism as a system (Akande et al. 2021; Mihai, 2014). Tourism is both an activity and an industry. It is considered an activity for those who participate in it, but it can also be viewed as an industry from the perspective of those who provide services to tourists. Scholars conceptualize tourism as both a social and economic activity. From a social perspective, tourism facilities interact between visitor and host communities, encourage cultural exchange, foster mutual understanding, and influence social values and lifestyles (Jafari, 2001). Economically, tourism is regarded as a major service-based activity that contributes to income generation, employment creation, foreign exchange earnings, and regional development (Cooper et al., 2008). Consequently, tourism is widely recognized as a strategic development tool, particularly in developing countries seeking economic diversification and poverty reduction. Tourism is also understood as a system comprising interrelated components. According to Leiper (1990), the tourism system consists of tourists (demand), generating regions, transit routes, destination regions, and the tourism industry that supplies goods and services. This systematic view highlights the interdependence of tourism elements and explains why disruptions such as insecurity, political instability, or poor infrastructure can significantly affect tourism performance.

The tourism industry refers to the collection of interrelated businesses, organizations, and institutions that provide goods and services to tourists and facilitate tourism activities. Unlike traditional manufacturing industries, the tourism industry is predominantly service-oriented, experiential, and people-centred (Cooper et al., 2008). It is characterized by intangibility, perishability, inseparability of production and consumption, and variability of service quality. Conceptually, the tourism industry is not a single sector but a composite of multiple sub-sectors, including accommodation establishments, transport services, travel agencies and tour operators, attractions, food and beverage services, entertainment, and ancillary services such as security, banking, and telecommunications (UNWTO, 2019). These components operate as a value chain, with each element contributing to the overall tourist experience.

Tourism businesses typically operate with limited capital, narrow market reach, and constrained access to institutional support (Beirman, 2013). Resilience literature indicates that firms adopt coping strategies, service diversification, adjusted operating hours, reliance on local



markets, and low-cost innovations to survive shocks, but coping does not necessarily equate to recovery (Biggs & Stoeckl, 2012).

Evidence from recent tourism research suggests that policy and regulatory frameworks can enhance tourism business performance by improving institutional coordination and reducing uncertainty. However, security-related interventions must align with business realities, as overly intrusive or poorly calibrated measures may negatively affect visitor perceptions and operational efficiency, thereby weakening enterprise performance (Sepúlveda & Bustamante-Caballero, 2023; Badoc-Gonzales et al., 2022).

Studies on small businesses in developing contexts show that insecurity and crisis conditions increase operating costs, constrain reinvestment, disrupt business hours, and erode customer confidence, ultimately threatening the sustainability of tourism SMEs (Badoc-Gonzales et al., 2022).

Resilience literature further demonstrates that tourism MSMEs' ability to withstand shocks is shaped by multidimensional factors—particularly governance, economic, social, and environmental resilience—which jointly determine their adaptive capacity during crises and insecurity situations (Badoc-Gonzales et al., 2022).

Moreover, entrepreneurial and organizational resilience—supported by social capital, networks, innovation, and adaptive capabilities—plays a critical role in enhancing business continuity, recovery, and long-term competitiveness in tourism and hospitality SMEs (Suherman et al., 2024; Rastrollo-Horrillo & Rivero Díaz, 2019; Ervina & Agoes, 2021).

Global work on security threats finds mixed macro effects: security threats reduce tourist receipts but can coincide with changes in employment and expenditure patterns [13](#), underscoring complex spillovers rather than simple linear decline.

A growing body of research on tourism SMEs in Africa and other developing contexts indicates a strong methodological bias toward **cross-sectional survey designs and descriptive statistical analysis**, which constrains causal inference and limits deeper understanding of dynamic business processes (Ntshangase & Ezeuduj, 2025; Tichaawa & Chamboko-Mpotaringa, 2025). For example, studies of tourism enterprises in Nigeria and South Africa frequently rely on structured questionnaires analyzed using correlations and regression models, offering useful associations but limited explanatory depth regarding causality and long-term adaptation.

Empirical work focusing specifically on tourism SMEs at the city level—such as in Jos Metropolis—remains scarce, as most studies either examine tourism at a macro level or treat SMEs as a broad, undifferentiated category across sectors (Mkwizu, 2025; Tichaawa & Chamboko-Mpotaringa, 2025).

Recent studies consistently demonstrate that insecurity is a significant external factor that undermines tourism development and the performance of tourism-related small and medium enterprises (SMEs). Security threats discourage tourist arrivals, reduce destination attractiveness, disrupt business operations, and weaken customer confidence. However, many of these studies primarily examine the direct relationship between insecurity and tourism performance, with limited attention to the interaction between security conditions, managerial capabilities, and long-term business resilience (Adebayo et al., 2025; Shenpam & Dangle, 2024; Akamavi et al., 2022).

Research focusing on SMEs indicates that insecurity contributes to declining productivity, increasing operational costs, reduced profitability, and business uncertainty. While these studies effectively explain the economic consequences of insecurity, they largely emphasize Nigerian case studies, limiting the generalizability of their findings to other tourism destinations with different socio-economic and institutional contexts (Ayobami et al., 2024; Onu & Nelson, 2025; Kisilu & Kimaru, 2025; Hassan et al., 2020; Isaac et al., 2025).

Several scholars argue that effective risk management and security strategies can mitigate the adverse effects of insecurity on business performance. These studies highlight the importance of proactive managerial practices, security investments, and strategic planning in improving organizational resilience. Nevertheless, they provide relatively limited empirical evidence regarding which specific security practices are most effective for tourism SMEs

operating under different levels of risk (Nwachukwu et al., 2025; Olabosinde & Kassah, 2025; Ihuoma et al., 2026).

Entrepreneurship and organizational capability have also been identified as critical determinants of tourism business performance. Innovation, entrepreneurial orientation, performance measurement systems, and institutional support strengthen business adaptability and competitiveness beyond merely responding to security threats. However, these studies generally treat insecurity as one of many external variables rather than integrating it into comprehensive models of tourism enterprise resilience (Kallmuenzer et al., 2019; Hamad & Xavier, 2025; Badoc-Gonzales et al., 2022).

Other researchers emphasize broader sustainability perspectives by examining tourism village empowerment, insurance adoption, employment dynamics, and labour market insecurity. These studies suggest that sustainable tourism requires integrated approaches involving government support, community participation, financial protection, and institutional collaboration. Despite these valuable contributions, empirical research rarely combines security, resilience, sustainability, and SME performance into a unified analytical framework, leaving important theoretical and practical gaps for future investigation (Dayour et al., 2020; Purnomo & Purwandari, 2025; Vergis et al., 2025; Salimon et al., 2019; Abraha & Gebre, 2025).

Mixed-methods approaches are comparatively rare but emerging. A few recent studies combine surveys with qualitative interviews to capture both structural patterns and contextual experiences; however, **full integration of quantitative performance metrics with qualitative insights on resilience, risk management, and insecurity remains limited** (Hamad & Xavier, 2025; Zhao et al., 2024).

Furthermore, existing literature often lacks sufficient disaggregation by firm size, subsector, and intra-urban spatial variation, reducing the ability to identify localized vulnerabilities and performance differences. In addition, insecurity is frequently operationalized as a single aggregated construct, rather than being differentiated into specific forms such as crime, terrorism, or communal conflict, thereby obscuring their distinct effects on tourism business performance (Suherman et al., 2024; Kawulur et al., 2025).

Existing research strongly supports a negative relationship between insecurity and tourism activity/SME performance, while also showing that well-designed policies, networks, and resilience strategies can partially offset these impacts. However, evidence for Jos Metropolis tourism SMEs is indirect, methods are largely cross-sectional and single-method, and insecurity is often crudely measured. A mixed-methods study focused on tourism SMEs in Jos can fill clear gaps by: (1) linking specific insecurity types to firm-level performance indicators, and (2) integrating quantitative trends with rich qualitative accounts of coping, resilience, and policy interaction.

2. Method

2.1 Design and sample

A mixed-methods approach was employed. A purposive sampling technique was initially used to identify tourism-related businesses, followed by convenience sampling in administering questionnaires to tourism-related businesses that were available during the survey. The quantitative component comprised structured questionnaires administered to managers of tourism-related businesses across Jos Metropolis. The qualitative component comprised semi-structured interviews with selected stakeholders (government officials, tourism managers, and business owners) to contextualize quantitative findings. Data were collected during a 2025 field survey.

2.2 Variables and measurement

The dependent variables include Business income (self-reported change or level), and the Independent variables are: decline in customer patronage due to insecurity; perceived seriousness of insecurity; business disruptions (closures, curfews, interruptions); effect on investment/expansion; government support for tourism-related businesses; adoption of business innovations (online marketing, delivery services, niche products).



2.3 Method of Analysis

Multiple linear regression was used to assess the relative contribution of each predictor to variation in business income. Model fit was evaluated using R^2 and the ANOVA F-test. Coefficient significance was assessed at $p < 0.05$. Qualitative interview data were analyzed thematically to triangulate and interpret quantitative results

3. Results and Discussion

3.1 Results

Table 1: Model Summary

R	R^2	Adjusted R^2
0.405	0.164	0.133

Table 2: Model summary

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.707	6	2.784	5.236	0.000
Residual	85.078	160	0.532		
Total	101.784	166			

$P=0.000$ as $p < 0.05$

Table 3: Coefficients Table

Predictor Variable	B	Beta	t	Sig.
Decline in customer patronage due to insecurity	0.357	0.354	4.856	0.000
Perceived seriousness of insecurity	-0.085	-0.124	-.682	0.094
Business disruptions due to insecurity	0.079	0.089	1.208	0.229
Effect on investment/expansion	0.017	0.027	0.367	0.714
Government support for tourism-related businesses	0.049	0.055	0.739	0.461
Adoption of business innovations	0.029	0.063	0.860	0.391

Significant at $p < 0.05$

Source: Field Survey, 2025

The tables above explain 16.4% of the variation in business income ($R^2 = 0.164$). The overall model is statistically significant ($F = 5.236$; $p < 0.05$). As shown in Table 3, a decline in customer patronage due to insecurity is the only significant predictor of business income ($\beta = 0.354$, $p < 0.05$).

3.1.1 Strength of Relationship and Model Explanatory Power

The results of the multiple linear regression analysis presented in Table 1 indicate that the correlation coefficient (R) is 0.405. This value reflects the overall strength and direction of the linear relationship between the set of independent variables and the dependent variable. In this context, the positive sign of the coefficient suggests that the independent variables—namely decline in customer patronage, perceived severity of insecurity, business disruptions, impact on investment or expansion, government support, and adoption of business innovation—tend to move in the same direction as the dependent variable. In other words, changes in these insecurity-related factors are associated with corresponding changes in the outcome variable, such as business performance. However, the magnitude of 0.405 indicates that the relationship is not particularly strong; rather, it falls within the weak to moderate range. This implies that while there is a meaningful association between the predictors and the dependent variable, the relationship is not sufficiently strong to suggest that these factors alone are dominant determinants of the outcome.

A correlation coefficient at this level is relatively common in studies involving social, behavioural, and economic phenomena, where outcomes are typically influenced by a wide array



of interconnected variables. In the present study, the moderate strength of the relationship may reflect the complexity of the business environment, particularly in contexts affected by insecurity. Factors such as customer behaviour, external economic conditions, managerial capability, market competition, and technological adaptation often interact simultaneously, making it difficult for a limited set of variables to capture the full dynamics influencing business performance. Therefore, while the identified predictors contribute to explaining the dependent variable, they should be viewed as part of a broader system of influences rather than as isolated determinants.

Further insight into the explanatory capacity of the model is provided by the coefficient of determination (R^2), which is reported as 0.164. This value indicates that approximately 16.4% of the total variation in the dependent variable can be explained by the six independent variables included in the regression model. In practical terms, this means that the model is able to account for a modest proportion of the variability in business performance (or the relevant outcome), leaving a substantial portion – approximately 83.6% – unexplained. This relatively low R^2 value suggests that there are many other factors not included in the model that play a significant role in determining the dependent variable.

It is important to note that a low R^2 does not necessarily invalidate the model or its findings. In research areas dealing with human behaviour and real-world business conditions, it is often unrealistic to expect very high explanatory power due to the inherent variability and unpredictability of such phenomena. Instead, an R^2 of 0.164 can still be considered meaningful, particularly if the model identifies statistically significant relationships and contributes to theoretical or practical understanding. In this case, the model highlights the relevance of insecurity-related factors, even though they represent only a portion of the broader set of influences affecting business outcomes.

The Adjusted R^2 value, reported as 0.133, provides a more conservative estimate of the model's explanatory power by accounting for the number of predictors included in the analysis. Unlike the standard R^2 , which tends to increase with the addition of more variables regardless of their relevance, the Adjusted R^2 penalizes the inclusion of unnecessary predictors. The fact that the Adjusted R^2 is slightly lower than the R^2 indicates that some of the variables may contribute limited explanatory value to the model. Nevertheless, the difference between the two values is not substantial, suggesting that the model does not suffer from excessive overfitting and that the included variables collectively provide a reasonable, albeit modest, explanation of the dependent variable.

From an interpretive standpoint, the Adjusted R^2 value of 0.133 implies that, after correcting for model complexity, approximately 13.3% of the variation in the dependent variable can be reliably explained by the independent variables. This reinforces the earlier conclusion that the model has limited explanatory power and that additional variables or alternative modelling approaches may be necessary to better capture the determinants of the outcome. For instance, future research could incorporate factors such as firm size, managerial experience, access to financial resources, market conditions, or consumer confidence, which may interact with insecurity-related variables to influence business performance more comprehensively.

The regression results indicate that the model demonstrates a positive but relatively modest relationship between insecurity-related factors and the dependent variable. While the correlation coefficient confirms the existence of an association, the R^2 and Adjusted R^2 values reveal that the model explains only a limited portion of the overall variation. These findings underscore the multifaceted nature of business performance in contexts affected by insecurity and highlight the need for further investigation into additional determinants that may enhance the explanatory power of the model.

3.1.2 Model Feasibility Test (F-Test)

Table 2 presents the results of the ANOVA (Analysis of Variance) test, which is employed to evaluate the overall feasibility and statistical validity of the multiple linear regression model. The F-test is a crucial component in regression analysis because it assesses whether the model, as a whole, provides a better fit to the data compared to a model with no independent variables. In other words, it tests the null hypothesis that all regression coefficients are simultaneously equal to zero, implying that none of the independent variables have any explanatory power with



respect to the dependent variable. Rejecting this null hypothesis indicates that the model has meaningful predictive capability.

In this study, the calculated F-value is 5.236, accompanied by a significance value (Sig.) of 0.000. Since the p-value is well below the conventional threshold of 0.05, the null hypothesis is rejected at the 5% significance level. This result demonstrates that the regression model is statistically significant, meaning that the set of independent variables included in the model collectively contributes to explaining variations in the dependent variable. The very low p-value also suggests strong evidence against the null hypothesis, reinforcing the reliability of the model's overall explanatory capacity.

The significance of the F-test result implies that, when considered together, the independent variables—decline in customer patronage due to insecurity, perceived severity of insecurity, business disruptions, impact on investment or expansion, government support, and adoption of business innovation—have a joint effect on the dependent variable, such as business performance. This finding is particularly important because it highlights that even if some individual variables may not show statistically significant effects in isolation (as assessed by the t-test), their combined influence can still be meaningful. Thus, the F-test provides a broader perspective on the usefulness of the model by evaluating the collective contribution of all predictors.

From a practical standpoint, the statistical significance of the model indicates that the regression equation derived from the analysis can be used as a valid tool for understanding the relationship between insecurity-related factors and the outcome variable. It suggests that the independent variables, as a group, contain sufficient information to explain changes in the dependent variable beyond what would be expected by random chance alone. This enhances confidence in the model's applicability for both academic analysis and potential policy or managerial decision-making.

However, it is important to interpret the results of the F-test in conjunction with other statistical measures, such as the coefficient of determination (R^2) and Adjusted R^2 . While the F-test confirms that the model is statistically significant, it does not provide information about the magnitude of the model's explanatory power. As indicated in the previous section, the relatively modest R^2 value suggests that the model explains only a limited portion of the total variation in the dependent variable. Therefore, although the model is statistically valid, its practical explanatory strength remains moderate, and there is still considerable unexplained variability that may be attributed to other factors not included in the analysis.

Additionally, the F-test result underscores the importance of considering the interaction and combined effects of multiple variables in complex real-world contexts. In the case of insecurity and its impact on business or tourism performance, it is unlikely that a single factor operates in isolation. Instead, various dimensions of insecurity—such as reduced customer patronage, perceived risk, operational disruptions, and constraints on investment—may interact in shaping outcomes. The inclusion of variables related to government support and business innovation further reflects the multifaceted nature of the issue, as these factors may mitigate or amplify the effects of insecurity. The significant F-test result suggests that capturing these diverse influences within a single model provides a more comprehensive understanding than examining each factor separately.

Moreover, the feasibility of the model, as confirmed by the F-test, indicates that the regression specification is appropriate for the data under study. This means that the functional form of the model and the selection of variables are sufficiently aligned with the underlying relationships in the data. Nevertheless, this does not preclude the possibility of improving the model in future research. For example, researchers may consider incorporating additional variables, exploring nonlinear relationships, or applying alternative analytical techniques to enhance the model's explanatory power and predictive accuracy.

The results of the ANOVA F-test demonstrate that the regression model is statistically significant and suitable for analysing the relationship between insecurity-related factors and the dependent variable. The independent variables, when considered simultaneously, exert a meaningful influence on the outcome, validating the overall structure of the model. Despite this,



the relatively moderate explanatory power indicates that the model should be viewed as a partial representation of a more complex reality, and further research is needed to capture the full range of factors influencing business or tourism performance in contexts affected by insecurity.

3.1.3 Effect of Each Independent Variable (t-Test)

The results of the partial regression coefficient test, as presented in Table 3, provide a more detailed examination of the individual contribution of each independent variable to the dependent variable within the regression model. Unlike the F-test, which evaluates the joint significance of all predictors, the t-test assesses whether each independent variable has a statistically significant effect on the dependent variable when the influence of other variables in the model is held constant. This allows for a clearer understanding of which specific factors play a meaningful role in explaining variations in the outcome.

Based on the analysis, it is evident that among the six predictor variables included in the model, only the decline in customer patronage due to insecurity demonstrates a statistically significant effect on the dependent variable. This variable has an unstandardized coefficient (B) value of 0.357, indicating that for every one-unit increase in the decline of customer patronage, the dependent variable is expected to increase by 0.357 units, assuming other variables remain constant. The positive sign of the coefficient suggests a direct relationship between the two variables. In practical terms, this implies that as businesses experience greater reductions in customer patronage due to insecurity, there is a corresponding increase in the adverse outcome measured by the dependent variable, such as a decline in business performance.

The standardized Beta coefficient of 0.354 further reinforces the importance of this variable, as it allows for comparison across variables measured on different scales. A Beta value of 0.354 indicates a moderate effect size, suggesting that the decline in customer patronage is a relatively strong predictor within the context of the model. Additionally, the t-value of 4.856 is substantially higher than the critical value typically required for statistical significance, and the associated p-value of 0.000 ($p < 0.05$) confirms that this effect is highly significant. Together, these statistics provide robust evidence that the decline in customer patronage due to insecurity is a key determinant of the dependent variable and plays a central role in shaping the observed outcomes.

In contrast, the remaining independent variables do not exhibit statistically significant effects, as indicated by their respective p-values, all of which exceed the 0.05 threshold. The perceived severity of insecurity, for instance, has a p-value of 0.094, which, although relatively close to the significance cutoff, is still insufficient to establish a statistically meaningful relationship. This suggests that while perceptions of insecurity may influence attitudes or expectations, they do not directly translate into measurable changes in the dependent variable within the context of this model. It is possible that the effect of perceived insecurity operates indirectly or is mediated by other variables, such as actual behavioral responses like reduced customer visits.

Similarly, business disruptions due to insecurity, with a p-value of 0.229, do not show a significant direct effect. This finding may appear counterintuitive, as disruptions are generally expected to impact business performance. However, it is possible that the effects of such disruptions are already captured by more immediate indicators, such as the decline in customer patronage, which may serve as a more direct and observable consequence of insecurity. Alternatively, businesses may have developed coping mechanisms that mitigate the impact of disruptions, thereby reducing their statistical significance in the model.

The variable representing the impact on investment or expansion decisions also fails to demonstrate significance, with a notably high p-value of 0.714. This suggests that, within the timeframe and context of the study, changes in investment or expansion behavior do not have an immediate or measurable effect on the dependent variable. Investment decisions are often long-term in nature, and their effects may not be fully reflected in short-term performance indicators, which could explain the lack of statistical significance.

Likewise, government support for the tourism or business sector does not exhibit a significant effect ($p = 0.461$). This may indicate that the level of support provided is either insufficient to produce a measurable impact or not effectively targeted toward addressing the



specific challenges posed by insecurity. It is also possible that the benefits of government interventions take time to materialize, thereby limiting their observable influence within the scope of the current analysis.

Finally, the adoption of business innovation, with a p-value of 0.391, is also not statistically significant. Although innovation is often associated with improved resilience and competitiveness, its impact may depend on the type, scale, and implementation of innovative practices. In some cases, innovation may require time and resources before yielding tangible results, which could explain why its effect is not immediately evident in the regression model.

Overall, the results of the t-test highlight the dominant role of customer behavior—specifically the decline in patronage—as the primary factor influencing the dependent variable in the context of insecurity. While other variables may still hold theoretical or practical relevance, their lack of statistical significance suggests that their direct effects are either weak, indirect, or context-dependent. These findings emphasize the importance of prioritizing strategies that address customer confidence and demand, as these appear to have the most immediate and substantial impact on business performance. At the same time, future research may benefit from exploring alternative model specifications, additional variables, or longer time horizons to better capture the complex and potentially lagged effects of the other factors examined in this study.

3.1.4 Overall Model Interpretation

Overall, the results of the analysis indicate that the regression model is statistically significant and appropriate for use in explaining the relationship between insecurity-related factors and the dependent variable, as evidenced by the F-value of 5.236 and a significance level of 0.000 ($p < 0.05$). This confirms that, when considered collectively, the independent variables included in the model provide meaningful explanatory value and are not merely contributing by chance. In other words, the model has passed the fundamental requirement of statistical validity, allowing it to be used as a basis for interpretation and further discussion. However, statistical significance alone does not necessarily imply strong explanatory power, and this distinction is critical in understanding the overall effectiveness of the model.

The explanatory capacity of the model, as reflected by the Adjusted R^2 value of 0.133, indicates that only 13.3% of the variation in the dependent variable can be explained by the set of independent variables included in the analysis. This level of explanatory power can be categorized as low to moderate, suggesting that while the model captures some important relationships, it leaves a substantial proportion—approximately 86.7%—of the variation unexplained. This finding highlights the complexity of business or tourism performance, particularly in environments affected by insecurity, where multiple internal and external factors interact simultaneously. Variables such as market competition, pricing strategies, service quality, macroeconomic conditions, consumer preferences, and technological adaptation may all play significant roles but are not captured within the current model.

The relatively modest Adjusted R^2 value also suggests that the phenomenon under study cannot be fully understood through a limited set of predictors. This is not uncommon in social science and business research, where outcomes are often influenced by a wide range of dynamic and interrelated variables. Therefore, while the current model provides useful insights, it should be viewed as a partial representation of reality rather than a comprehensive explanation. Future studies may enhance the explanatory power of the model by incorporating additional relevant variables, exploring interaction effects, or applying alternative analytical approaches such as nonlinear modelling or longitudinal analysis to capture changes over time.

Despite these limitations, an important and consistent finding from the analysis is that the decline in customer patronage due to insecurity emerges as the most influential factor affecting the dependent variable. This variable has been shown to have a statistically significant effect, indicating that it plays a central role in shaping business or tourism performance in the context of insecurity. The prominence of this factor underscores the critical importance of customer behaviour as a direct and immediate driver of business outcomes. When customers perceive an environment as unsafe or unstable, their reduced willingness to visit or engage with businesses leads to tangible declines in revenue, operational activity, and overall performance.



This finding carries significant practical implications for stakeholders in the business and tourism sectors. In particular, it suggests that efforts to mitigate the negative impacts of insecurity should prioritize strategies aimed at maintaining and restoring customer trust and confidence. Such strategies may include enhancing security measures, improving communication to reassure customers, implementing flexible service offerings, and leveraging digital platforms to maintain engagement even in times of uncertainty. In the tourism sector, for example, destination marketing efforts that emphasize safety, reliability, and positive experiences can help counteract negative perceptions and encourage visitor return.

At the same time, the lack of statistical significance for other variables in the model – such as perceived severity of insecurity, business disruptions, impact on investment or expansion, government support, and adoption of business innovation – does not necessarily imply that these factors are unimportant. Rather, it suggests that their effects may be indirect, context-dependent, or not immediately observable within the scope of the current analysis. For instance, government support programs may take time to produce measurable outcomes, while innovation initiatives may require sustained implementation before their benefits become evident. Similarly, perceptions of insecurity may influence behaviour through mediating variables, such as customer confidence, rather than exerting a direct effect.

Therefore, these variables should not be dismissed outright but rather reconsidered in future research. Scholars may explore alternative ways of measuring these constructs, examine their interaction with other variables, or incorporate them into more comprehensive models that better capture the complexity of the business environment. Additionally, qualitative approaches or mixed-methods research may provide deeper insights into how these factors operate in practice and influence decision-making processes.

The overall interpretation of the model suggests that while it is statistically valid and offers valuable insights, its explanatory power remains limited, indicating the need for further refinement and expansion. The key takeaway is the dominant role of customer patronage in driving business performance under conditions of insecurity. As such, both researchers and practitioners should focus on understanding and addressing the factors that influence customer behaviour, while also continuing to explore additional determinants that may enhance the robustness and comprehensiveness of future models.

3.2 Discussion

The regression analysis revealed that insecurity has a statistically significant impact on tourism-related businesses in Jos Metropolis. The ANOVA result indicated that the regression model was significant ($F = 5.236$, $p < 0.05$), confirming that insecurity-related factors collectively influence businesses that are highly sensitive to security conditions, particularly in destinations experiencing recurrent security challenges. The model explained 16.4% of the variance in business income ($R^2 = 0.164$), suggesting that while insecurity is a critical determinant of business performance, other factors, such as economic conditions, infrastructure, marketing capacity, and seasonal demand, also play important roles. This finding aligns with earlier studies that argue that insecurity does not operate in isolation but interacts with broader structural and institutional challenges affecting tourism destinations (Hall, 2010; Beirman, 2013).

Amongst all the predictors examined, decline in customer patronage due to insecurity emerged as the strongest and only statistically significant predictor of business income loss ($\beta = 0.354$, $p < 0.05$). This indicates that insecurity affects tourism-related businesses primarily by discouraging tourists and visitors from patronizing tourism facilities. These findings reveal the centrality of tourist confidence and perceived safety in sustaining tourism demand in Jos Metropolis. Repeated incidents of insecurity, travel advisories, and negative media portrayals likely reduce visitor inflow, thereby lowering revenue for hotels, restaurants, transport operators, event centres, and recreational facilities. This result is consistent with the work of Neumayer (2004) and Sonmez and Graefe (1998), who established that tourists are risk-averse and tend to avoid destinations perceived as unsafe. Similarly, Pizam and Mansfeld (2006) observed that even isolated security incidents can lead to prolonged declines in tourist arrivals, especially in destinations already struggling with reputation challenges.



Although the regression model is statistically significant, it exhibited relatively low explanatory power ($R^2 = 0.164$), which indicates that insecurity-related variables account for only a limited proportion of the variation in business income. This suggests that business performance in Jos Metropolis is influenced by a wider set of factors beyond insecurity, highlighting the complexity of tourism-based enterprises. The low R^2 underscores the likelihood of omitted variable bias, as important firm-level and contextual factors such as firm size, years of operation, location, seasonality, and access to finance were not included in the model. These factors may independently or jointly shape business income and potentially moderate the effects of insecurity. Furthermore, the model did not capture interaction effects, which could explain differences in vulnerability across businesses. For example, smaller firms are most likely to be seriously affected by insecurity compared to bigger or more established tourism-related businesses. Irrespective of all these limitations, the findings clearly establish that a decline in customer patronage is the primary pathway through which insecurity impacts business income, reinforcing the central role of tourists' confidence and perceived safety in sustaining tourism demand.

Contrary to expectations, frequent business disruptions such as closures, curfews, and operational interruptions did not significantly predict income loss ($P = 0.229$). This may imply that tourism-related businesses in Jos have developed adaptive coping strategies, such as adjusting operating hours. Nightlife in Jos Metropolis has reduced drastically within the time frame of this study. This is a typical coping strategy; other strategies could be diversifying services or relying on local patronage during periods of instability. The finding resonates with resilience theories in tourism, which argue that businesses in insecurity-prone destinations often adapt to persistent risks rather than cease operations entirely (Biggs et al., 2012). While such coping strategies may reduce immediate losses, they do not necessarily promote long-term growth or sustainability.

The effect of insecurity on investment and expansion plans was not statistically significant ($p = 0.714$). This reveals that although insecurity may discourage long-term investments, its immediate effect on a business's income is limited. This shows that the reality is that many tourism businesses in Jos Metropolis are small-and medium-scale enterprises (SMEs) that operate with limited expansion ambitions.

Government support for tourism-related businesses did not significantly affect businesses' income ($p = 0.461$). This suggests that existing government interventions may be insufficient, inaccessible, or poorly targeted to cushion tourism businesses against the impacts of insecurity effectively. The findings align with studies in developing economies that highlight weak institutional support frameworks for tourism-related businesses during crises (UNWTO, 2021).

The adoption of business innovations, such as online marketing, delivery services, and niche tourism products, was not a significant predictor of income stability ($p = 0.391$). This suggests that while innovation is often promoted as a resilience strategy, its effectiveness is constrained in environments where insecurity fundamentally limits mobility, visitation, and consumer confidence. The findings challenge the optimistic assumption in the literature that innovation alone can offset crisis impacts and support the argument that security remains a fundamental requirement for tourism development (Beirman, 2013).

A recurring issue that was raised by the respondents was the noticeable decline in tourist inflow linked to insecurity. Many participants revealed that travel decisions, both local and international, are strongly influenced by how safe a destination is perceived to be. As a result of this, fewer tourists are coming in, which has directly affected tourist inflow and, by extension, business earnings. Attractions such as the National Museum record a fair number of tourists, stakeholders pointed out a clear reduction in international tourists and organized group visits, especially during the periods of heightened insecurity. This implies that while domestic tourism offers some level of support, it does not fully make up for the overall decline in visitor numbers. This observation aligns with the regression results, where a decline in customer patronage was the only variable that significantly affected business income. It shows that insecurity impacts businesses mainly by discouraging demand rather than forcing businesses to shut down completely.



Private business owners who participated reported the increasing cost of running their businesses due to insecurity. Many reported spending more on security measures, such as hiring extra guards and installing surveillance systems to protect their facilities. A participant identified an incident of theft, including the removal of solar panels, chairs, cables, and roofing materials, which demonstrates a high level of perceived vulnerability that has led to increased financial losses, delayed project completion, and an inability to employ adequate security personnel due to high costs. However, the regression analysis did not show a significant effect from this factor. This suggests that although these added costs reduce profits, they may not instantly reflect in overall income levels when compared to the stronger effect of reduced patronage. It appears that these businesses are managing these operational costs in the short term, which may not be sustainable over time.

Another theme that was identified is how tourism-related businesses are adjusting in the heat of insecurity. Some respondents described some coping strategies, like changing operating hours, cutting down on nightlife, and focusing more on domestic customers. The responses show a level of resilience among tourism-related businesses operating in an insecure environment. However, this also supports the regression findings, where variables related to disruptions and innovation were not statistically significant. This suggests that while these strategies help businesses stay afloat, they do not fully replace the income lost from reduced tourist demand.

The findings also point to differences between public and private tourism operators. Public institutions, like the National Museum, tend to benefit from security provided by the government; meanwhile, private businesses often have to take financial responsibility for their security arrangements. The uneven situation explains why government support did not emerge as a significant factor in the regression results. Its impact appears to be restricted and not equally distributed across businesses. More broadly, it reflects underlying disparities within the tourism sector, where some businesses are more exposed to the impacts of insecurity than others.

Findings show that insecurity creates a significant burden for the operations of tourism actors, especially in the private sector. The transport and event center operators recorded increased spending on security guards, security systems, and infrastructure security. Moreover, theft and vandalism cases caused economic losses, delayed projects, and limited the ability to create more jobs. On the other hand, the National Museum Jos, which is a federal institution of the Nigerian government, did not show a rise in its expenses related to security because of the presence of state security personnel. From an empirical perspective, the result is in line with the studies carried out by Neumayer (2004) and Adebayo & Alao (2021), who showed that the cost of business is significantly affected by the factor of insecurity, limiting tourism growth and diversification.

The narratives from stakeholders reveal that insecurity has hurt the destination image of Jos Metropolis, particularly in relation to previous bomb blasts and security incidents that have been associated with the destination. If the tourism attractions were not affected by insecurity, their proximity and location would harm the attractions. Sönmez, Apostolopoulos, and Tarlow (1999) contend that destinations impacted by insecurity frequently endure protracted recovery periods due to persistent risk perceptions, which is consistent with the observation that Jos' reputation is slowly getting better but has not fully translated into increased tourism inflow.

Tourism-related businesses have revealed conflicting opinions on the involvement of the government in resolving the security concerns that have been impacting tourism. The private sector has revealed limitations, such as a lack of security organizations, creating a susceptible environment to crime. In terms of governance, these points correspond with the idea that public-private models of security have an important role in the successful development of tourism in areas of risk (UNWTO, 2019). These issues of structural inequality in tourism are compounded by the fact that private tourism companies use their own in-house models of security, which could act as a deterrent for other investment and innovation in this area.



4. Conclusion

Insecurity in Jos Metropolis significantly undermines tourism-related businesses' income primarily through reduced customer patronage. While these businesses adopt adaptive strategies and innovations, these measures are insufficient to restore lost demand in the absence of improved security and coordinated institutional support. The study makes the following recommendations.

(1) Targeted security improvements: Prioritize visible, verifiable security measures in tourism corridors, markets, and attractions to restore visitor confidence. The Plateau State Government, in collaboration with the Federal security agencies such as the police and DSS, should concentrate on key tourism corridors, markets, and major attractions.

(2) Accessible institutional support: The findings suggest that the existing government support is either inadequate or not reaching the businesses that need it the most. The state government, through its relevant agencies, should design support packages for tourism SMEs that combine short-term liquidity relief with incentives for safety-compliant investments (e.g., perimeter security, CCTV, staff training) and simplify access procedures. (3) Destination-image Restoration: Security improvements alone may not immediately bring tourists back if negative perceptions remain. Coordinated and aggressive marketing campaigns organized by the private sector with the support of the state government can make meaningful differences. (4) Business Adaptations by tourism businesses to adjust to the current realities. Many tourism-related businesses have devised diverse ways of adapting by focusing on domestic tourists and adjusting operation hours. These efforts can be strengthened by training these business owners and staff on how to cope in the midst of the insecurity challenges. (5) Monitoring and Evaluation: The government, in collaboration with researchers and industry stakeholders, can develop a simple way of monitoring the tourist inflow, the business performance, and their security conditions. Existing data can be leveraged upon and improved upon to ensure that decisions are based on evidence, and this would make interventions adjustable when necessary.

Future research: Longitudinal studies tracking recovery trajectories, experimental evaluations of targeted support packages, and comparative studies across Nigerian destinations would strengthen causal understanding and inform policy design.

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