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Safety First, Productivity Follows: Unpacking the Health and Safety Management-Performance Link in Delta State's Deposit Money Banks

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Abstract **Original Research Article**

Employee productivity in the banking sector is heavily influenced by workplace conditions, particularly the effectiveness of health and safety management systems (HSMS). In Delta State, Nigeria, deposit money banks (DMBs) are critical to financial stability, yet employees often face occupational hazards including stress, long working hours, poor ergonomics, and exposure to robbery-related risks. Despite existing policies and regulatory frameworks, the extent to which HSMS influence employee productivity in this context remains underexplored. This study investigated the relationship between HSMS and employee productivity in DMBs in Delta State, focusing on incident occurrence levels, workplace hazard identification, and compliance with safety regulations. A descriptive survey design was adopted, with 300 respondents drawn from selected DMBs using stratified random sampling; 255 questionnaires were validly retrieved (85% response rate). Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression techniques via SPSS version 25 and EViews 9.0. Findings revealed that incident occurrence levels had no significant effect on employee productivity ($\beta = 0.044$, $p = 0.300$), suggesting organizational resilience buffers acute incident impacts. However, workplace hazard identification ($\beta = 0.138$, $p = 0.008$) and compliance with safety regulations ($\beta = 0.160$, $p = 0.010$) both significantly and positively influenced productivity. The model explained 62.1% of variance in employee productivity ($R^2 = 0.621$; $F = 5.54$, $p = 0.001$). The study concludes that proactive hazard identification and regulatory compliance are critical drivers of workforce performance in the banking sector and recommends their strategic integration into organizational culture.

Keywords: Health and safety management system, employee productivity, deposit money banks, hazard identification, safety compliance, Delta State.

1. INTRODUCTION

In today's rapidly evolving business environment, employee safety and productivity have emerged as critical concerns for organizations, especially in the banking sector, where operational efficiency is central to competitiveness. A robust Health and Safety Management System (HSMS) plays a vital role in ensuring that workplace conditions are conducive to the physical and psychological well-being of employees (Katz et al., 2022; Ugbeghene & Eromafuru, 2026).). In developed economies, the integration of health and safety policies within corporate structures has significantly improved worker morale, minimized absenteeism, and enhanced organizational performance (ILO, 2023). However, in developing regions like Nigeria, including Delta State, the implementation and impact of such systems remain under-researched.

Deposit money banks (DMBs) are integral to the financial stability of the Nigerian economy, providing a variety of services including deposits, loans, and financial advisories to individuals, businesses, and governments. Employees in these banks often operate under high-pressure environments, extended work hours, and risk exposure to occupational hazards such as stress-related illnesses, ergonomic injuries, and robbery-related trauma (Okoh & Iheriohanma, 2021; Omoye et al., 2024; Eruvwe et al., 2024). The importance of a comprehensive health and safety framework in such settings cannot be overstated; organizations that invest in health and safety enjoy better productivity outcomes (Okechukwu & John, 2020; Akinwale & George, 2019). According to WHO (2022), healthy workers are more productive, and safety-conscious environments often experience improved staff retention, motivation, and operational efficiency.

Despite this recognition, anecdotal evidence suggests that many DMBs in Delta State approach health and safety from a compliance rather than a strategic productivity perspective (Ajibola & Gbadamosi, 2023). The workforce in Delta State banks is composed largely of young professionals under pressure to meet the expectations of customers and management alike, yet there is scant empirical evidence on the level of implementation of health and safety measures in banks within the region. This neglect can have dire consequences: a demotivated, unhealthy, or injured workforce is unlikely to contribute meaningfully to organizational success. While Nigeria has legal frameworks such as the Factories Act (2004) and the Employees' Compensation Act (2010), enforcement remains weak and implementation gaps persist due to limited awareness, inadequate training, and inconsistent enforcement (Eze & Nwaneri, 2020).

The present study is situated within this critical discourse. It seeks to examine the nexus between health and safety management systems and employee productivity in deposit money banks in Delta State, Nigeria, with specific focus on three dimensions: incident occurrence levels, workplace hazard identification, and compliance with safety regulations. The goal is to generate insights capable of guiding both policy and practice toward creating safer, healthier, and more productive banking workplaces.

1.1 Statement of the Problem

There is a growing concern about the adequacy of health and safety practices in Nigerian banks. While regulatory frameworks exist through agencies such as the Nigeria Social Insurance Trust Fund (NSITF) and occupational safety and health administration guidelines, implementation remains inconsistent (Ajibola & Gbadamosi, 2023). Employees in banks in Delta State frequently report long hours, poor ergonomic provisions, and psychological stress from high customer demand volumes and robbery risks (Udu & Nwaeke, 2020). Previous studies have produced mixed findings: Eze (2019) found that banks with clearly defined HSMS reported higher employee satisfaction and lower turnover, while Olorunfemi and Adeola (2021) argue that HSMS in many Nigerian banks are largely ceremonial, exerting minimal influence on actual work conditions. These contradictions underscore a significant knowledge gap regarding the real impact of HSMS on productivity within the specific context of Delta State's banking sector, creating a pressing need for empirical investigation.

1.2 Objectives of the Study

The broad objective of this study is to assess the effect of health and safety management systems on employee productivity in deposit money banks in Delta State. Specifically, the study seeks to: (i) determine the relationship between incident occurrence levels and employee productivity; (ii) examine the influence of workplace hazard identification practices on employee productivity;

and (iii) assess the effect of compliance with safety regulations on employee productivity in DMBs in Delta State.

1.3 Research Hypotheses

H_{01}: There is no significant relationship between incident occurrence levels and employee productivity in DMBs in Delta State.

H_{02}: Workplace hazard identification does not significantly influence employee productivity in DMBs in Delta State.

H_{03}: Compliance with safety regulations does not have a significant effect on employee productivity in DMBs in Delta State.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Health and Safety Management System (HSMS)

A Health and Safety Management System (HSMS) is a coordinated and systematic approach to managing workplace health and safety risks, integrating organizational policies, objectives, and procedures to ensure the continuous identification, assessment, and control of workplace hazards (ILO, 2023). The primary aim of HSMS is to prevent accidents, injuries, and illnesses while establishing a safe and healthy working environment. In deposit money banks, HSMS encompasses enforcement of safety regulations, provision of protective equipment, and regular safety training for employees. Beyond compliance, a well-implemented HSMS constitutes a proactive tool for organizational sustainability; organizations with comprehensive safety systems experience reduced absenteeism, improved morale, and enhanced operational efficiency (Griffin & Neal, 2022; Aruoren & Ugbeghene, 2023). A good HSMS follows the Plan-Do-Check-Act (PDCA) cycle, ensuring that health and safety practices evolve with emerging risks (Hughes & Ferrett, 2021).

The components of HSMS are interrelated and must be managed holistically: health and safety policy, hazard identification and risk assessment, training and communication, and monitoring and continuous improvement (ILO, 2023). Health and safety policy reflects leadership commitment and outlines responsibilities aligned with legal requirements. Hazard identification systematically recognizes potential harm sources and implements control measures. Training ensures employees recognize risks and use safety equipment effectively, while monitoring involves auditing performance and making evidence-based improvements (Olayemi & Adeoti, 2020). In the specific context of Delta State's DMBs, integrating these components into operational workflows fulfils legal obligations while promoting productivity, job satisfaction, and institutional resilience.

2.1.2 Employee Productivity

Employee productivity refers to the efficiency and effectiveness with which employees perform assigned duties to achieve organizational goals, typically measured as output relative to inputs of time, effort, and resources (Armstrong, 2020; Omoye et al., 2024). In the banking sector, productivity encompasses customer service quality, transaction processing speed, client satisfaction, and regulatory compliance. The concept is multifaceted, influenced by working conditions, motivation, management style, skills, health status, and workplace safety. When employees operate in safe and supportive environments, their ability to concentrate, perform tasks accurately, and meet deadlines improves significantly (Omisore & Adeleke, 2021: Tom et al, 2025). In contrast, poor health and safety conditions lead to absenteeism, high turnover, fatigue, and diminished output. Higher employee productivity in service-oriented industries like banking contributes to better financial service delivery, increased customer confidence, and overall economic stability (Akinbami & Aransi, 2022; Omoye, 2025).

2.1.3 Relationship between HSMS and Employee Productivity

The relationship between HSMS and employee productivity is both direct and significant. A well-established HSMS reduces workplace hazards and fosters a secure environment, boosting employee morale, commitment, and efficiency (Adebayo &

Olatunji, 2022; Omoye, 2026). Empirical studies consistently show that organizations with effective health and safety policies report higher productivity, as fewer accidents translate to lower downtime and increased employee availability (Ekundayo & Ojo, 2020; Akpomiemie et al., 2026). Psychosocial safety, protection from stress, harassment, and burnout, is equally critical; mental strain from long hours and unclear policies lowers cognitive performance and increases error rates (Yusuf & Adetunji, 2021; Omoye et al, 2026). Employee involvement in safety planning further reinforces this relationship: inclusive HSMS practices promote accountability and innovation, both productivity enhancers in knowledge-driven sectors (Olawale & Bamidele, 2023).

2.2 Theoretical Framework

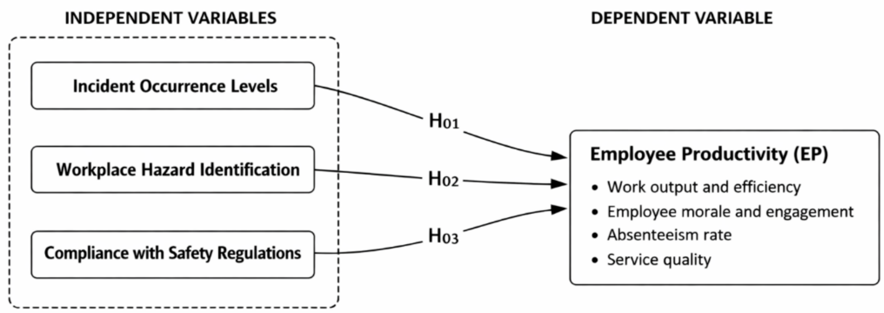
This study draws upon three key theories. Herzberg's Two-Factor Theory (1959) distinguishes motivators from hygiene factors such as working conditions and job security. Ensuring a safe work environment through HSMS constitutes a hygiene factor that, when properly managed, creates the baseline conditions necessary for productivity. Maslow's Hierarchy of Needs (1943) positions safety needs at the second tier: until these needs are fulfilled, employees are unlikely to pursue higher-level motivations that drive peak performance. In banking institutions, effective HSMS meets these safety needs, enabling commitment, creative problem-solving, and higher performance (Eze & Onwuka, 2022). Systems Theory (Bertalanffy, 1968) views organizations as interrelated subsystems where a deficiency in workplace safety can negatively affect the performance of other areas, including service quality and employee morale. These three theories collectively provide a comprehensive theoretical lens for examining the HSMS–productivity relationship in Delta State's DMBs.

2.3 Conceptual Framework

The conceptual framework of this study illustrates the hypothesized relationships between the independent variable Health and Safety Management System (HSMS) and the dependent variable, Employee Productivity, within the context of deposit money banks (DMBs) in Delta State, Nigeria. The framework is grounded in the theoretical propositions of Herzberg’s Two-Factor Theory, Maslow’s Hierarchy of Needs, and Systems Theory, which collectively establish workplace safety as a foundational prerequisite for optimal employee performance.

As depicted in Figure 1, HSMS is operationalized through three measurable dimensions: (i) Incident Occurrence Level (IOL) capturing the frequency of workplace accidents and injuries; (ii) Workplace Hazard Identification (WHI) representing the systematic detection and mitigation of occupational risks; and (iii) Compliance with Safety Regulations (CWSR) reflecting the degree to which banks adhere to national and institutional safety standards. Each dimension is posited to exert a direct influence on Employee Productivity, proxied by indicators including work output, employee morale and engagement, absenteeism rate, and service quality. The strength and direction of these relationships are empirically tested through three null hypotheses (H_{01}, H_{02}, H_{03}). The framework is situated within the regulatory and organizational context of Delta State DMBs, which moderates how HSMS practices are implemented and experienced.

Figure 1: Conceptual Framework of HSMS and Employee Productivity



Context: DMBs in Delta State, Nigeria

Source: Researcher's construct, 2026

2.4 Empirical Review and Research Gap

Globally, the WHO (2022) reports that organizations implementing comprehensive HSMS record a 20% increase in employee productivity and significant reductions in absenteeism. Lee and Ahmed (2021) found that structured safety training, ergonomic interventions, and psychological health support in multinational financial institutions contributed to enhanced staff performance and improved customer satisfaction. Within Nigeria, Akinwale and George (2019) reported underperformance in safety system implementation due to lack of top management commitment, while Okechukwu and John (2020) found a strong positive correlation between safety training and employee efficiency among bank staff. In Delta State specifically, Eze (2019) revealed that organizations with active safety committees and regular health audits experienced higher staff satisfaction and lower absenteeism, while Okoh and Iheriohanma (2021) identified psychological stress from unsafe environments as a major productivity constraint for banking employees.

Despite this growing body of evidence, a notable gap persists: most studies concentrate on manufacturing or construction sectors, leaving service industries such as banking underexplored. Existing Nigerian studies rarely employ empirical methodologies to quantify the specific effects of HSMS components on performance indicators, lack regional specificity, and seldom account for moderating variables. This study addresses these gaps by empirically examining the HSMS–productivity relationship in DMBs in Delta State, providing region-specific, quantitative insights to guide targeted and effective safety strategies.

3. RESEARCH METHODOLOGY

3.1 Research Design and Population

The study adopted a descriptive survey research design, which is appropriate for obtaining opinions and factual information from a sample generalizable to a larger population. The population comprised all staff members of selected deposit money banks in Delta State, Nigeria, including both managerial and non-managerial employees across branches in Asaba, Warri, and Ughelli, an estimated 2,000 staff based on data from the Nigerian Deposit Insurance Corporation (NDIC, 2025).

3.2 Sample and Sampling Technique

A sample of 300 respondents was drawn using a stratified random sampling technique to ensure fair representation across different departments and job roles. Stratification was based on job level (managerial, supervisory, clerical, operations), with proportionate sampling determining the number of respondents from each stratum. Of the 300 questionnaires distributed, 255 were duly completed and returned, yielding a response rate of 85%, which is considered adequate for statistical analysis.

3.3 Research Instrument

The primary instrument was a structured questionnaire titled the Health and Safety Management and Employee Productivity Questionnaire (HSMEPQ), divided into four sections: demographic information, incident occurrence levels (10 items), workplace hazard identification (10 items), compliance with safety regulations (10 items), and employee productivity indicators (5 items). All measurement items employed a 5-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). Content and face validity were established through review by two university lecturers in Business Administration and one occupational health specialist. Reliability was assessed via a pilot test with 30 respondents, yielding a Cronbach's Alpha coefficient of 0.70 or above across all sub-scales, confirming high internal consistency.

3.4 Model Specification and Data Analysis

Data were analyzed using SPSS version 25 for descriptive statistics and Pearson correlation, and EViews 9.0 for multiple regression analysis. To examine the influence of HSMS dimensions on employee productivity, the following multiple linear regression model was specified:

$$EP = \beta_0 + \beta_1 IOL + \beta_2 WHI + \beta_3 CWSR + \varepsilon$$

Where EP = Employee Productivity (dependent variable); IOL = Incident Occurrence Level; WHI = Workplace Hazard Identification; CWSR = Compliance with Safety Regulations; β_0 = intercept; β_1–β_3 = regression coefficients; and ε = error term. Significance was determined at the 0.05 level; model fitness was assessed using R^2, adjusted R^2, F-statistic, and p-values.

4. RESULTS

4.1 Demographic Characteristics of Respondents

Table 1 presents the demographic profile of the 255 respondents. Males constituted 52.94% of the sample and females 47.06%, indicating a fairly balanced gender distribution. The age group 26–35 years was the largest (53.33%), followed by 18–25 years (36.47%), reflecting a predominantly youthful workforce. Most respondents were junior staff (82.35%), consistent with the pyramidal structure of DMBs. Importantly, 50.59% had over six years of banking experience, indicating that most respondents possessed substantial operational knowledge relevant to assessing HSMS–productivity relationships.

Table 1: Demographic Characteristics of Respondents (N = 255)

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	135	52.94
	Female	120	47.06
Age Group	18–25 years	93	36.47
	26–35 years	136	53.33
	36–45 years	16	6.27
	46 and above	10	3.92
Job Role	Staff	210	82.35

	Supervisor	31	12.16
	Manager	14	5.49
Work Experience	Less than 1 year	14	5.49
	1–3 years	81	31.76
	4–6 years	31	12.16
	Above 6 years	129	50.59

Source: Researcher's fieldwork, 2026

4.2 Descriptive Statistics of HSMS Variables

The descriptive results for the three HSMS dimensions and employee productivity are summarized in Table 2. Respondents agreed that incident occurrence levels negatively affect productivity (aggregate mean = 3.50, SD = 0.83). Agreement was notably stronger for workplace hazard identification (aggregate mean = 4.00, SD = 0.64), indicating that banks proactively identify and address hazards and that employees perceive these practices as productivity-enhancing. The highest agreement was recorded for compliance with safety regulations (aggregate mean = 4.20, SD = 0.57), with respondents strongly affirming that regulatory compliance boosts morale, reduces stress, and improves performance. Employee productivity itself was perceived as strongly linked to health and safety conditions (aggregate mean = 4.02, SD = 0.55).

Table 2: Aggregate Descriptive Statistics for Study Variables

Variable	No. of Items	Aggregate Mean	Std. Deviation	Remark
Incident Occurrence Level (IOL)	10	3.50	0.83	Agree
Workplace Hazard Identification (WHI)	10	4.00	0.64	Agree
Compliance with Safety Regulations (CWSR)	10	4.20	0.57	Agree
Employee Productivity (EP)	5	4.02	0.55	Agree

Source: Researcher's computation, 2026

4.3 Correlation Analysis

The Pearson correlation matrix (Table 3) reveals weak but positive associations among all variables. WHI exhibited the strongest correlation with EP (r = 0.177), followed by CWSR (r = 0.169), while IOL had the weakest correlation with EP (r = 0.091). Inter-correlations among the independent variables were minimal (WHI–IOL: r = 0.108; CWSR–IOL: r = 0.060), suggesting the absence of multicollinearity concerns.

Table 3: Pearson Correlation Matrix

Variable	WHI	IOL	CWSR	EP
WHI	1.000			
IOL	0.108	1.000		
CWSR	0.029	0.060	1.000	
EP	0.177*	0.091	0.169*	1.000

*Note: *p < 0.05. Source: Researcher's computation, 2026*

4.4 Multiple Regression Analysis and Hypothesis Testing

Table 4 presents the multiple regression results. The overall model was statistically significant (F = 5.538, p = 0.001), and the R^2 of 0.621 indicates that approximately 62.1% of the variance in employee productivity is explained by the three HSMS predictors. The adjusted R^2 of 0.509 confirms adequate explanatory power after adjustment for sample size.

Table 4: Multiple Regression Results (Dependent Variable: Employee Productivity)

Variable	Coefficient (β)	Std. Error	t-Statistic	p-Value	Decision on H_0
Constant	0.672	0.343	1.963	0.051	
IOL	0.044	0.043	1.038	0.300	Accept H_{01}
WHI	0.138	0.051	2.692	0.008**	Reject H_{02}
CWSR	0.160	0.061	2.611	0.010**	Reject H_{03}
R^2 = 0.621	Adj. R^2 = 0.509	F = 5.538	p(F) = 0.001		

*Note: **p < 0.01. Source: EViews 9.0 output, 2026*

Hypothesis H_{01} (incident occurrence levels have no significant relationship with employee productivity) was accepted (β = 0.044, p = 0.300 > 0.05), indicating that the frequency of workplace incidents does not significantly predict productivity among bank employees in Delta State.

Hypothesis H_{02} (workplace hazard identification does not significantly influence employee productivity) was rejected (β = 0.138, p = 0.008 < 0.05), confirming that proactive hazard identification significantly and positively predicts employee productivity.

Hypothesis H_{03} (compliance with safety regulations does not have a significant effect on employee productivity) was rejected (β = 0.160, p = 0.010 < 0.05), demonstrating that adherence to safety regulations is a significant, positive determinant of productivity.

5. DISCUSSION

5.1 Incident Occurrence Levels and Employee Productivity

The finding that incident occurrence levels (IOL) exert no significant influence on employee productivity (β = 0.044, p = 0.300) diverges from the general expectation that higher accident rates directly diminish workforce output. This aligns with Okolie and Okoye (2022), who reported that incident occurrences in formal organizations may not always correlate directly with productivity due to proactive safety culture and rapid recovery measures adopted by management. Similarly, Adebayo and Lawal (2021) observed that organizational resilience strategies mitigate the adverse impact of incident occurrences on workforce performance. A plausible explanation in the Delta State banking context is that banks have sufficient procedural and organizational buffers, such as trained security personnel and staff rotation policies, that prevent individual incidents from substantially disrupting overall productivity metrics.

However, this finding contrasts with Umeokafor (2020), who stressed that incident occurrences significantly hinder productivity in Nigerian organizations through psychological stress and reduced confidence, and with Eze and Onoh (2021), who linked frequent workplace incidents to absenteeism and higher turnover. The apparent contradiction may be context-dependent: while individual productivity may be temporarily disrupted, aggregate bank-level performance metrics might remain stable due to team redundancy and management intervention. This underscores the importance of context and organizational preparedness as moderating factors in the incident–productivity relationship.

5.2 Workplace Hazard Identification and Employee Productivity

The significant positive effect of workplace hazard identification on employee productivity ($\beta = 0.138$, $p = 0.008$) is consistent with Ibrahim and Hassan (2021), who emphasized that proactive hazard identification enhances job satisfaction, minimizes accident rates, and boosts performance. Onwuka and Nwankwo (2022) similarly reported that hazard identification provides employees with a sense of safety and assurance, encouraging commitment and improved work efficiency. When banks actively identify hazards, they reduce the incidence of workplace injuries and illnesses, leading to fewer sick days and greater continuity in service delivery (Ogundipe & Nwachukwu, 2022). Moreover, environments where employees participate in hazard reporting promote a sense of ownership and accountability, improving productivity through mutual support in maintaining a risk-free workspace (Adebayo & Nkwocha, 2022). These findings support Okonkwo and Ezeani's (2023) observation that staff in banks with proactive hazard management practices reported a 20–30% increase in output.

A contrasting perspective from Osei and Boateng (2020) cautions that hazard identification alone may not automatically translate into productivity improvements without complementary risk management and mitigation strategies. Bello and Ali (2021) further posit that over-reporting and administrative delays associated with hazard identification could slow processes and reduce productivity. This suggests that while hazard identification is a critical determinant of productivity, its effectiveness depends on how well it is integrated with broader risk management and organizational safety culture.

5.3 Compliance with Safety Regulations and Employee Productivity

The finding that compliance with safety regulations significantly predicts employee productivity ($\beta = 0.160$, $p = 0.010$) aligns with Adeyemi and Olatunji (2022), who noted that adherence to safety standards reduces accidents, enhances employee morale, and promotes efficiency in Nigerian workplaces. Yusuf and Dauda (2021) similarly found that safety compliance significantly boosts organizational trust and commitment, leading to higher productivity. The mechanisms through which compliance enhances productivity are multifaceted: it minimizes workflow disruptions from workplace accidents; fosters psychological well-being by reducing stress levels; strengthens internal communication and accountability; improves organizational resilience; and enhances the institution's reputation, aiding talent attraction and retention (Olaniyan & Afolabi, 2023; Eze & Nnaji, 2022).

Amadi and Uche (2020) offer a counterpoint, arguing that strict compliance may create operational delays and increased bureaucracy in fast-paced work environments, while Akinwale and Olawale (2021) caution that excessive focus on regulations without flexibility may restrict workflow efficiency. These contrasting views suggest that compliance with safety regulations should be balanced with operational agility to maximize productivity outcomes, and that the design of safety regulatory frameworks should consider the operational realities of the banking sector.

6. Conclusion and Recommendations

6.1 Conclusion

This study empirically investigated the impact of health and safety management systems on employee productivity in deposit money banks in Delta State, Nigeria. The findings demonstrate that while incident occurrence levels do not significantly predict employee productivity in isolation, likely due to organizational resilience mechanisms, both workplace hazard identification and compliance with safety regulations are significant, positive determinants of workforce performance. The regression model explained 62.1% of the variance in employee productivity, affirming the collective importance of HSMS dimensions. In a high-stress industry such as banking, where employees face compounded physical and psychological pressures, health and safety systems are not merely regulatory necessities but strategic tools for performance management. The study confirms the need for a paradigm shift in Delta State's DMBs from compliance-based to strategic safety management, where employee well-being is prioritized as a critical business objective.

6.2 Recommendations

Based on these conclusions, the following recommendations are advanced. First, bank management should institutionalize comprehensive HSMS that extend beyond incident tracking to include proactive hazard identification protocols and employee participation in safety planning, as these demonstrate stronger productivity returns than reactive incident management. Second, banks should enhance employee training on hazard recognition, ergonomic practices, emergency response, and stress management to create a shared culture of safety responsibility. Third, regulatory bodies including the CBN, NSITF, and the Ministry of Labour should strengthen enforcement of occupational safety standards and mandate periodic safety compliance audits in DMBs, particularly in semi-urban regions. Fourth, given that compliance with safety regulations yielded the strongest productivity effect in this study, banks should allocate dedicated budgets for safety compliance activities, wellness programs, and ergonomic infrastructure. Finally, future studies should employ longitudinal designs and incorporate qualitative methods to assess how leadership style and organizational safety culture moderate the HSMS, productivity relationship across multiple sectors and regions.

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