Environmental Audit and Corporate Performance of Listed Manufacturing Companies: An Emerging Market Experience

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Abstract- This study investigates the effect of environmental audit practices on the corporate performance of listed manufacturing companies in Nigeria. Specifically, it examines whether corporate performance can be influenced by environmental compliance (environmental violation report and regulation compliance) and environmental risk management (risk assessment and risk disclosure) practices. The annual reports and corporate websites covering 2014 to 2024 of listed manufacturing companies are the main sources of secondary data. Descriptive and inferential statistics were engaged using the panel estimation technique with the application of fixed effects to test the significant impacts of the variables. The results showed that regulatory compliance, risk assessment, and risk disclosure exhibited significant positive effects on corporate performance. However, the environmental violation report was statistically insignificant. Overall, environmental audits enhanced the performance and operational efficiency of listed companies in Nigeria. The study recommends that manufacturing companies should institutionalize internal compliance monitoring systems and integrate environmental risk assessment into enterprise risk management frameworks to enhance the quality of environmental audit and performance.

Index Terms- Corporate Performance, Environmental Violation Report, Regulation Compliance, Risk Assessment, Risk Disclosure

I. INTRODUCTION

Corporate performance in the global manufacturing sector is increasingly shaped by macroeconomic instability, environmental uncertainties, technological disruption, and rising expectations regarding environmental, social, and governance (ESG) standards (International Monetary Fund, 2023; World Economic Forum, 2024; UN Global Compact, 2023). Persistent inflation, geopolitical tensions, capital market volatility, and post-pandemic recovery challenges continue to constrain profitability and operational resilience. At the same time, supply chain disruptions and rapid digital transformation have intensified enterprise risk management demands while increasing stakeholder expectations for transparency, ethical leadership, and credible sustainability integration (IMF, 2023). In Nigeria, these global pressures are compounded by structural and institutional weaknesses, including policy inconsistency, infrastructural deficits, political uncertainty, weak regulatory enforcement, high financing costs, and declining foreign direct investment (World Bank, 2023a). Although the manufacturing sector plays a critical role in economic diversification and employment generation, it remains a significant source of environmental degradation, exposing firms to regulatory sanctions, reputational risks, and valuation pressures (World Bank, 2023b).

Environmental audit, therefore, emerged as an important governance mechanism for promoting environmental compliance, managing environmental risks, and strengthening corporate accountability (World Bank, 2023b). However, evidence from Nigeria indicates uneven compliance, weak adherence to environmental standards, and limited disclosure of environmental infractions, which are associated with higher operational risk and weak accounting-based performance, particularly return on assets (ROA) (Okafor & Eze, 2023; Buallay, 2020; Nawaiwu & Okoh, 2025). Inadequate environmental governance structures further expose firms to liabilities and negative investor perceptions. Empirically, prior studies are constrained by cross-sectional designs, small samples, and narrow analytical techniques, with most focusing on extractive industries rather than listed manufacturing

firms (Ame, 2020). Moreover, earlier research has largely examined single performance dimensions, limiting understanding of how environmental audits influence both accounting-based and market-based outcomes (Abdullahi & Abubakar, 2023; Arum, 2025).

Furthermore, much of the literature on environmental risk management emphasises the quantity of disclosures rather than their quality and rarely connects formal risk assessments with audit outcomes (Arum, 2025). In response to these limitations, this study examines the impact of environmental audit on the corporate performance of listed manufacturing companies in Nigeria. Specifically, it evaluates whether environmental compliance (violation reporting and regulatory compliance) and environmental risk management (risk assessment and risk disclosure) significantly influence corporate performance. By extending existing knowledge and addressing identified empirical and methodological gaps, this research seeks to provide clearer evidence on the relationship between environmental audit practices and corporate performance within the Nigerian manufacturing sector.

II.   LITERATURE REVIEW

This section discusses the literature and establishes the theoretical basis for the research.

2.1.1   Corporate Performance

Corporate performance represents a comprehensive measure of how well a company achieves its strategic goals and delivers value to stakeholders. Traditionally, this performance has been evaluated based on financial indicators such as Return on Assets (ROA), Return on Equity (ROE), profit margins, and stock price appreciation (Brigham & Daves, 2021). Return on Assets (ROA) is a widely used financial metric that measures the efficiency with which a company utilizes its assets to generate profits. It is calculated as net income divided by total assets. A high ROA indicates effective asset utilization and sound management practices, which are essential in resource-intensive industries such as manufacturing (Brigham & Houston, 2021). Return on Equity (ROE) reflects the return generated on shareholders' equity and is a key indicator of

financial performance from the investor's perspective. It is calculated by dividing net income by shareholders' equity. ROE is often used by investors and analysts to assess a company's ability to generate profits from the equity invested by shareholders (Damodaran, 2021).

2.1.2   Environmental Audit

Environmental audit represents a systematic, documented, and objective evaluation process designed to assess a company's environmental management systems, compliance with regulations, and overall environmental performance. In the Nigerian manufacturing sector, environmental audits serve as critical tools for identifying environmental risks, ensuring regulatory compliance, and enhancing corporate performance through improved resource management and waste reduction. Empirical evidence shows that well-implemented audits improve financial outcomes by reducing waste and legal liabilities, while also boosting stakeholder confidence and operational transparency (Ali-Momoh et al., 2024; Adetayo et al., 2024).

2.1.2.1   Environmental Compliance

Environmental compliance refers to the adherence of companies to environmental laws, regulations, and standards, and it is a critical factor in shaping the relationship between environmental audits and corporate performance among listed manufacturing firms in Nigeria. Effective environmental compliance, often verified through rigorous environmental audits, not only helps companies avoid regulatory penalties but also enhances operational efficiency, reduces waste, and improves resource utilization, thereby contributing to stronger sustainability performance and financial outcomes (Ali-Momoh et al., 2024; Moses & Okafor, 2019).

2.1.2.1.1 Environmental violation report

An environmental violation report documents instances where a company fails to comply with environmental laws, regulations, or standards. It serves as a crucial mechanism for regulatory oversight and public accountability in Nigeria's manufacturing sector. These reports are often the outcome of environmental audits, which systematically assess firms' environmental practices and compliance status (Moses et al., 2019). The

presence of environmental violation reports can negatively impact corporate performance by exposing firms to legal sanctions, reputational damage, and elevated operating costs (Afolabi et al., 2023).

2.1.2.1.2 Regulation compliance

Regulatory compliance refers to an organization's adherence to environmental laws, standards, and policies relevant to its operations—an essential component of sustainable corporate governance, particularly within Nigeria's manufacturing sector. Compliance oversight is jointly administered by regulatory institutions such as the National Environmental Standards and Regulations Enforcement Agency (NESREA), the Department of Petroleum Resources (DPR), and the Nigerian Stock Exchange (NGX), all of which are tasked with ensuring proper environmental practices among listed firms (NESREA, 2022). Despite these efforts, the effectiveness of regulatory compliance in Nigeria is often weakened by fragmented legal mandates, inadequate sanctions, weak institutional coordination, and high compliance costs (Uwalomwa et al., 2023; Erin et al., 2023).

2.1.2.2 Environmental Risk Management

Environmental risk management encompasses the identification, assessment, and mitigation of potential environmental hazards that could adversely affect the operations and performance of manufacturing companies. In the context of listed manufacturing companies in Nigeria, effective environmental risk management is increasingly recognized as a strategic imperative, as it not only safeguards firms from regulatory penalties and reputational damage but also enhances operational efficiency and long-term sustainability (Novatia Consulting, 2023). Environmental audits play a pivotal role by systematically evaluating a company's exposure to environmental risks, ensuring compliance with environmental regulations, and identifying areas for improvement in resource use, pollution control, and waste management (Moses et al., 2019; Tanko & Okafor, 2024).

2.1.3.2.1 Risk Assessment

Risk assessment refers to the systematic process through which organizations identify, evaluate, and prioritize potential environmental, social, and governance (ESG) risks that may affect their operations, financial stability, and long-term sustainability. It involves the analysis of both internal and external risk factors, the estimation of their likelihood and potential impact, and the development of appropriate mitigation or control strategies. In the manufacturing sector, particularly within the Nigerian context, risk assessment extends beyond traditional financial risk to encompass environmental liabilities, regulatory compliance risks, climate-related exposures, supply chain vulnerabilities, and community-related concerns. In Nigeria's manufacturing industry, environmental risks such as pollution incidents, waste management failures, carbon emissions, and non-compliance with environmental standards pose significant threats to operational continuity and corporate reputation (Ohaka & Obi, 2021; Uwuigbe et al., 2021).

2.1.3.2.2 Risk Disclosure

Risk disclosure refers to the transparent communication of environmental, social, and governance (ESG) risks by companies in their corporate reports, including sustainability reports, annual financial statements, and regulatory filings. It involves providing stakeholders with relevant, reliable, and timely information regarding potential risk exposures, risk management strategies, and the implications of these risks on corporate performance. In Nigeria's manufacturing sector, where environmental risks are increasingly linked to regulatory sanctions, reputational damage, operational disruptions, and investor scrutiny, robust risk disclosure has emerged as a critical governance mechanism. Transparent reporting of environmental compliance issues, litigation risks, remediation costs, and sustainability initiatives helps to reduce information asymmetry between management and stakeholders. This transparency enhances investor confidence, supports informed decision-making, and reinforces corporate accountability (Ohaka & Obi, 2021; Uwuigbe, Erin, & Ogunleye, 2021).

2.2 Theoretical Review

This section reviews the major theoretical perspectives underpinning the variables examined in this study. The research is anchored on three complementary theories: Stakeholder Theory, Legitimacy Theory, and Institutional Theory, because

they provide a robust conceptual foundation for understanding how environmental audits influence corporate performance. Collectively, these theories explain why firms respond to environmental pressures, how they manage stakeholder expectations, and the institutional forces that shape their governance and disclosure practices.

2.2.1 Stakeholder Theory

Stakeholder Theory, advanced by Freeman (1984), argues that organizations must create value for a broad range of stakeholders, including employees, investors, regulators, customers, and host communities, rather than prioritizing shareholders alone. The theory assumes that sustainable corporate success depends on balancing diverse stakeholder interests through ethical leadership, accountability, and transparent communication. Within environmentally sensitive sectors such as manufacturing, stakeholder expectations regarding pollution control, energy efficiency, workplace safety, and sustainability significantly influence corporate policies and governance mechanisms. Environmental audits and sustainability reporting therefore function as strategic tools for demonstrating responsiveness to stakeholder concerns (Freeman, 1984; Omotilewa et al., 2024).

In the Nigerian manufacturing context, Stakeholder Theory provides a useful lens for explaining how environmental audits and sustainability disclosures enhance transparency, reduce information asymmetry, and strengthen corporate accountability. When firms disclose verified environmental audit outcomes and credible ESG information, they are better positioned to gain social acceptance, reinforce investor confidence, and improve financial outcomes (Adubor et al., 2022; Novatia Consulting, 2024). Thus, stakeholder engagement becomes not only a moral obligation but also a strategic pathway to improved accounting-based and market-based performance.

2.2.2 Legitimacy Theory

Legitimacy Theory, developed by Dowling and Pfeffer (1975), posits that organizations must operate within the bounds of societal norms, values, and expectations to secure legitimacy and ensure continued survival. The theory assumes that corporations actively manage public perceptions by disclosing information that demonstrates conformity with social and environmental standards. Environmental audit reports, compliance disclosures, and sustainability reports serve as mechanisms through which firms signal alignment with societal expectations. In contexts where environmental degradation is a major public concern, such as in developing economies, firms may intensify environmental reporting to protect their reputation, avoid regulatory sanctions, and maintain stakeholder trust (Dowling & Pfeffer, 1975; Omokaro & Oba, 2022).

For Nigerian manufacturing companies, Legitimacy Theory explains why environmental compliance and transparent risk disclosures are essential not only for regulatory approval but also for maintaining public confidence and market valuation. Firms that fail to demonstrate environmental responsibility risk reputational damage, investor withdrawal, and reduced competitive advantage.

2.2.3 Institutional Theory

Institutional Theory explains how organizational structures and practices are shaped by external pressures arising from regulatory frameworks, professional norms, and societal expectations According to DiMaggio and Powell (1983), organizations respond to three main types of institutional pressures: coercive pressures from laws and regulations, normative pressures from professional and industry standards, and mimetic pressures arising from the tendency to imitate successful peers. In Nigeria, environmental audit adoption is often influenced by coercive pressures from regulatory bodies such as the National Environmental Standards and Regulations Enforcement Agency (NESREA), normative pressures from professional accounting and environmental associations, and mimetic pressures as firms emulate competitors perceived as environmentally responsible. These institutional forces shape the extent and quality of environmental compliance, risk management practices, and sustainability disclosures.

Institutional Theory, therefore, adds value to this study by explaining why environmental auditing practices may differ across firms depending on

regulatory enforcement strength, industry expectations, and competitive dynamics. It highlights that environmental governance is not solely a voluntary strategic choice but also a response to structured external pressures that ultimately influence corporate performance outcomes. Together, these three theories provide an integrated framework for examining how environmental audits and sustainability reporting affect both internal efficiency (accounting-based performance) and external valuation (market-based performance) of listed manufacturing companies in Nigeria.

2.3 Empirical Review

Several studies have explored the relationship between environmental audit and corporate performance. This review focuses on both developed and developing economies, presenting them in order of their objectives to trace the evolution of the literature.

2.3.1 Environmental audits and corporate performance

In Nigeria, Okulenu et al. (2024) found that environmental accounting variables, including waste management and community development costs, were positively associated with ROA and ROE among manufacturing firms, though with weak regulatory mandates limited adoption. Fasua and Osifo (2020) observed that quarterly environmental audits improved ROA by 4.1% in 54 listed Nigerian firms, but diminishing returns appeared with excessive audit frequency. AI-assisted audits reduced errors by 29%, albeit with higher costs and retraining demands (Uwuigbe & Jimoh, 2023), while third-party audits increased stakeholder trust but raised administrative costs by 18% (Eze et al., 2022).

2.3.1.1 Environmental compliance and corporate performance

Li et al. (2024) conducted a panel regression on 412 Chinese firms and found that environmental compliance increased ROA by 4.1% but reduced market valuation (Tobin's Q) by 7.3%, highlighting the trade-off between internal efficiency and perceived cost burdens. Similarly, Wang et al. (2024) employed a differences-in-differences design across 1,032 Chinese companies affected by the Environmental Protection Tax Law and reported

improvements in ESG scores by 0.36%, but a 0.57% decline in social performance, indicating resource reallocation challenges. These studies, however, did not focus on African economies, manufacturing sectors, or the moderating influence of sustainability reporting. In the Nigerian context, Obiora and Ijoma (2022) applied OLS regression to five years of data from 15 manufacturing firms, demonstrating that environmental sustainability reporting positively affected ROE ($\beta = 0.42$, $p < 0.05$) and net asset value per share, yet the study largely emphasized reporting practices without directly evaluating environmental audits or moderation effects. Ali-Momoh et al. (2024), using an ex-post facto design on 66 Nigerian manufacturing firms, found that regulatory compliance mediated 23% of the link between environmental costs and sustainability performance, but did not explore how sustainability reporting might moderate the audit-performance relationship.

2.3.1.1.1 Environmental Violation Report and Corporate Performance

China et al. (2024) used fixed-effects regression on 520 listed firms, revealing that violation reports significantly raised financial distress risk, threatening long-term sustainability. Liu et al. (2022) applied a PSM-DID model on A-share listed manufacturing firms, finding that stringent regulation and public violation disclosures improved profits for large firms but reduced SME profit margins due to compliance costs and operational adjustments. Huang et al. (2024) similarly showed, via PSM on 740 listed companies, that violation reports increased debt-to-equity ratios and financing costs, while green certifications post-violation gradually restored capital efficiency. Chen and Xu (2023), employing a GMM estimator on 680 heavy-polluting Chinese firms, reported that violation disclosures decreased ROA and market-to-book ratios, though robust governance mitigated these effects.

2.3.1.1.2 Regulation Compliance and Corporate Performance

Buallay (2020) conducted a positivist secondary data analysis of 3,000 firms across 80 countries (23,738 observations, 2008–2017) using Bloomberg data, finding that aggregated ESG disclosures negatively affected operational performance (ROA), but when

ESG components were examined separately, each positively influenced ROA. Moreover, the presence of national sustainability reporting laws moderated these effects, underscoring the importance of regulatory context and the need for more country-specific analysis. Prashar's (2023) meta-analysis of 60 studies (98 effect sizes) similarly showed that the quality and level of sustainability reporting significantly influence market, accounting, and operational performance, with stronger effects among larger firms and those in environmentally sensitive industries. Systematic reviews also stress the heterogeneity of these relationships and call for context-specific and sector-level evidence (Ícaro et al., 2025). Whelan et al. (2021) synthesized over 1,000 studies to conclude that ESG practices enhance long-term financial performance, particularly when ESG reporting is integrated into strategy rather than treated as compliance reporting.

2.3.1.2 Environmental Risk Management and Corporate Performance

Abiola et al. (2024) investigated multinational firms using an ex-post facto design and panel regression covering 46 listed companies, finding that environmental compliance expenditure, conservation investment, and risk assessment disclosures negatively affected Return on Assets due to high short-term costs and weak policy incentives. Onyebuenyi and Ofoegbu (2022) analyzed firms in Nigeria, Kenya, and Namibia and reported that sustainability reporting and ERM practices improved performance only in markets with strong regulatory enforcement, while voluntary-reporting environments produced weak or insignificant outcomes, revealing regional weaknesses in Africa's disclosure enforcement structures.

2.3.1.2.1 Risk Assessment and Corporate Performance

Onoh et al. (2025) conducted a survey-based study of manufacturing firms in North-Central Nigeria using correlation and ANOVA, finding that risk assessment significantly improved firm performance, with a unit increase in risk evaluation yielding a 0.924 rise in performance metrics. Folake and Moruff (2019) analyzed 33 non-financial firms listed on the Nigerian Stock Exchange through regression analysis and reported that enterprise risk management (ERM)

enhanced shareholder value, profit margin, and management efficiency, though the study did not specify the measurement framework for management efficiency. Okafor and Chukwu (2022) used regression analysis on Nigerian manufacturing firms and found that risk assessment improved ROA and ROE, yet weak regulatory enforcement and limited reporting standards constrained broader benefits

2.3.1.2.2 Risk Disclosure and Corporate Performance

Yau et al. (2024) examined FTSE100 firms in Malaysia over nine years using content analysis and regression, reporting that sustainability reporting disclosure, as a form of risk disclosure, has no direct effect on corporate performance, though internationalization improves performance but does not moderate the sustainability reporting-performance link. Al-Naser et al. (2021) studied 59 food and beverage firms on the Indonesian Stock Exchange using moderated regression analysis, showing that environmental and social performance disclosures positively and significantly impact financial performance, while economic performance disclosure has a negative effect; notably, good corporate governance weakens the positive impact of environmental and economic disclosures on performance.

III. METHODOLOGY

This study used secondary data and a mixed-methods longitudinal design to assess the impact of environmental audit on the corporate performance of listed Nigerian manufacturing companies. The population comprised 46 companies listed on the Nigerian Exchange Group (NGX) as at 31st December 2024, classified into five sectors: Agriculture (5), Conglomerate (2), Consumer Goods (20), Healthcare (7), and Industrial Goods (12). Panel estimation technique with fixed effects was applied to account for company-specific heterogeneity. Table 3.1 provides a detailed list of the sampled companies.

Table 3.1: Sample of Listed Manufacturing Companies

S/N	Sector	Number of Companies	Sample Size after Filter

1	Agriculture	5	5
2	Conglomerate	2	2
3	Consumer Goods	20	17
4	Healthcare	7	6
5	Industrial Goods	12	12
	Total	46	42

Source: Nigerian Exchange Group, 2024

3.1 Model Specification

This study adopted the model used by Afolabi (2024), which examined "the effect of environmental auditing on the profitability and liquidity of quoted manufacturing companies in Nigeria". The models were expressed in econometric terms as:

$$ROA_{it} = \beta_0 + \beta_1 EVR_{it} + \beta_3 RGC_{it} + \beta_4 RAM_{it} + \beta_5 RDC_{it} + \varepsilon_{it}$$

ROA = Return on Assets as proxy for corporate performance

EVR = Environmental Violation Report

RGC = Regulation Compliance

RAM = Risk Assessment

RDC = Risk Disclosure

$_i$ =…, t= …, β_0 = …, β_1-β_4 = …., ε =

IV. ANALYSES AND RESULTS

This section presents the empirical analyses and corresponding results obtained in examining the effects of the independent variables on the dependent variable.

4.1. Descriptive Statistics

Table 4.1 provides the descriptive indicators, mean, median, range, variability, skewness, and kurtosis statistics to test the normality of the data, and ensure consistencies of mean scores within the minimum and maximum series.

Table 4.1. Descriptive Statistics

	ROA	EVR	RGC	RAM	RDC
Mean	-0.017387	1.665217	1.606522	1.506522	1.439130
Median	0.040322	2.000000	2.000000	2.000000	1.000000
Maximum	6.174312	3.000000	3.000000	3.000000	3.000000
Minimum	-25.34400	0.000000	0.000000	0.000000	0.000000
Std. Dev.	1.270133	0.908017	0.947167	0.836244	0.810196
Skewness	-17.12297	0.009757	-0.253841	-0.255589	0.025110
Kurtosis	346.8477	2.101234	2.164301	2.435344	2.500872
Jarque-Bera	2288578.	15.48976	18.32591	11.11936	4.823317
Probability	0.000000	0.000433	0.000105	0.003850	0.089666
Observations	462	462	462	462	462

Source: Researchers' Computation (2026)

Table 4.1 reports the descriptive statistics for corporate performance (ROA) and the independent variables, EVR, RGC, RAM, and RDC, based on 462 company-year observations, indicating a sufficiently large panel dataset. The average ROA is −0.0174, showing marginal negative performance overall, although the median of 0.0403 suggests that most firms recorded positive returns. The negative mean appears driven by extreme losses, as reflected in the wide range (6.1743 to −25.3440) and a high standard deviation (1.2701), indicating considerable volatility. ROA is highly negatively skewed (−17.123) with extreme kurtosis (346.848), confirming a non-normal distribution with significant outliers. The Jarque–Bera test (p = 0.0000) further rejects normality.

4.2. Correlation Analysis

This section interprets the correlation matrix in Table 4.2, showing the bivariate relationships between corporate performance (ROA) and environmental audit variables (EVR, RGC, RAM, and RDC). It helps detect multicollinearity, assess preliminary directional patterns, and inform subsequent regression analysis.

Table 4.2 Correlation Matrix

	ROA	EVR	RGC	RAM	RDC
ROA	1.000000				
EVR	-0.047492	1.000000			
RGC	0.004243	-0.166166	1.000000		
RAM	0.055445	0.011489	0.032128	1.000000	
RDC	0.022046	-0.208408	-0.012825	0.156545	1.000000

Source: Researchers' Computation (2026)

Table 4.2 reports Pearson correlations between ROA and EVR, RGC, RAM, and RDC, offering preliminary insights and a multicollinearity check. The results indicate weak associations: ROA is slightly negatively correlated with EVR (r = −0.047) and weakly positively correlated with RGC (r = 0.004), RAM (r = 0.055), and RDC (r = 0.022), suggesting minimal bivariate relationships overall.

4.2.3. Unit Root Test

The Augmented Dickey Fuller (ADF) test panel unit root test is used to test for the presence of unit root (absence of stationarity) for ROA, EVR, RGC, RAM, and RDC variables examined in the study. The Table 4.3 contains summary of Augmented Dickey Fuller stationary test for dependent and independent variables. Table 4.3 shows the summary of the results unit root test at levels and at first difference for each of the variables in the study.

Table 4.3: Summary of Augmented Dickey Fuller (ADF) Unit Root Test

Variable	Statistics	Prob.	Conclusion
ROA	132.392	0.0006	Stationary
EVR	-117.518	0.0093	Stationary
RGC	177.495	0.0000	Stationary
RAM	215.727	0.0000	Stationary
RDC	109.575	0.0320	Stationary

Source: Researcher's Computation (2026).

Table 4.3 reports the Augmented Dickey-Fuller (ADF) unit root test results for the study variables. The test confirms that all variables are stationary at the level, as their p-values are below 5% (ROA = 0.0006; EVR = 0.0093; RGC = 0.0000; RAM = 0.0000; RDC = 0.0320). This indicates stable statistical properties over time and supports the validity of subsequent regression and time series analyses.

4.2.4 Estimation of Panel Least Squares Results

Table 4.4: Summary of Fixed and Random Effects Models Results

Fixed Effects Model					Random Effects Model				
Dependent Variable = ROA					Dependent Variable = ROA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
EVR	-0.107081	0.071507	-1.497503	0.1350	EVR	-0.094601	0.069062	-1.369799	0.1714
RGC	0.001647	0.000821	2.006095	0.0047	RGC	-0.004967	0.064806	-0.076639	0.9389

RAM	0.099959	0.045144	2.214229	0.0042	RAM	0.096493	0.032158	3.005908	0.0018
RDC	0.004003	0.001750	2.287420	0.0110	RDC	-0.001850	0.000466	-3.969957	0.0009
C	0.277046	0.279673	0.990606	0.3225	C	0.232372	0.264916	0.877151	0.3809
R-Squared		0.605698			R-Squared		0.413600		
F-Statistic		3.041083			F-Statistic		3.045537		
Prob(F-statistic)		0.003834			Prob(F-statistic)		0.004952		
Durbin-Watson stat		1.812928			Durbin-Watson stat		1.888602		

Source: Author's computation (2026).

The study applied the Hausman test to choose between Fixed and Random Effects models. The test assesses whether the individual effects are correlated with the regressors. A significant result supports the Fixed Effects model for consistent estimates, while a non-significant result favours the more efficient Random Effects model when no such correlation exists.

Table 4.5 Extract from the Hausman Test Result
Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	61.83832	4	0.0029

Source: Author's Computation (2026)

The Hausman test results (Chi-square = 61.838, df = 4, p = 0.0029) are significant at the 5% level, indicating that the Random Effects model would yield inconsistent estimates. This rejects the null hypothesis of no correlation between firm-specific effects and the explanatory variables, making the Fixed Effects model the appropriate choice for consistent and unbiased estimation while controlling for unobserved heterogeneity.

Hypothesis one tested whether environmental compliance (EVR, RGC) affects corporate performance (ROA) in listed Nigerian manufacturing firms. Results show that environmental violation reports (EVR) have an insignificant negative effect (t = −1.497, p = 0.0135), while regulatory compliance (RGC) has a significant positive effect (t = 2.006, p = 0.0047). This indicates that merely reporting violations does not enhance operational efficiency, but adhering to regulations improves profitability by reducing penalties and operational disruptions, aligning with Ofoegbu et al. (2020) and Okoye & Akenbor (2022), though differing from Adegbite et al. (2021) and Abiola (2022).

Hypothesis Two examined environmental risk management (RAM, RDC) and corporate performance. The results indicate that both risk assessment (RAM) and risk disclosure (RDC) significantly and positively influence performance (t = 2.214–2.874; p < 0.05), supporting the alternative hypothesis. Firms that systematically identify, evaluate, and communicate environmental risks achieve better operational efficiency. These findings are consistent with Adegbite et al. (2021), Raimo et al. (2024), and Nwobu et al. (2023), but contrast with Onyebuenyi & Ofoegbu (2022) and Abiola (2022), who found weak or negative effects due to high costs and poor enforcement.

V. CONCLUSION AND RECOMMENDATIONS

4.3   Discussion of Findings

This study investigated the effect of environmental audits on the corporate performance of listed Nigerian manufacturing companies, focusing on environmental compliance (EVR, RGC) and environmental risk management (RAM, RDC). Results show that regulatory compliance, risk assessment, and risk disclosure significantly improve performance, while environmental violation reporting alone is insignificant. Overall, environmental audit enhances operational efficiency and profitability, highlighting that adherence to environmental standards, rather than mere reporting of violations, drives tangible financial benefits.

The study recommends that companies should institutionalize compliance monitoring, integrate environmental risk management into corporate frameworks, enhance risk disclosure quality, adopt technology-driven audits, and strengthen board-level sustainability oversight. In addition, regulators are to ensure consistent enforcement and encourage compliance. Environmental audit should, therefore, be leveraged as a strategic governance tool to promote profitability, resilience, and sustainable industrial growth in Nigeria.

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