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Environmental, Social, and Governance (ESG) Practices and Return on Assets of Listed Firms in Nigeria

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Abstract

This study examines the effect of Environmental, Social, and Governance (ESG) practices on the Return on Assets (ROA) of listed firms in Nigeria. Using panel data from firms listed on the Nigerian Exchange Group (NGX) over the period 2010–2025, the study employs Fixed Effects regression with robust standard errors to address heteroskedasticity and serial correlation (Baltagi, 2013). The ESG framework is decomposed into three dimensions: Environmental (ENV), Social (SOC), and Governance (GOV), alongside control variables of firm size (SIZE) and leverage (LEV). The Hausman specification test confirmed the Fixed Effects Model as the preferred estimator. Findings reveal that composite ESG performance positively and significantly improves ROA ($\beta = 0.421$, $p < 0.01$). At the disaggregated level, Governance exerts the strongest positive effect ($\beta = 0.548$, $p < 0.01$), followed by Environmental performance ($\beta = 0.309$, $p < 0.01$) and Social performance ($\beta = 0.176$, $p < 0.05$). Firm size positively influences ROA, while leverage negatively affects profitability. These results are consistent with Stakeholder Theory, the Resource-Based View, and Social Contract Theory. The study concludes that ESG integration is a strategic value-creating mechanism for Nigerian listed firms and recommends that corporate managers, regulators, and investors prioritize ESG adoption, particularly governance reforms, to improve long-term financial performance.

Keywords: ESG Practices, Return on Assets, Environmental Performance, Social Performance, Governance Performance, Nigeria, Panel Data, Fixed Effects

1. Introduction

The global business environment has undergone a significant paradigm shift from the traditional concept of Corporate Social Responsibility (CSR) to a more comprehensive and measurable framework known as Environmental, Social, and Governance (ESG) practices. ESG represents a multidimensional approach to evaluating corporate sustainability performance, integrating environmental stewardship, social responsibility, and governance structures into firm operations and strategic decision-making (Friede et al., 2021). This transition reflects the growing recognition that long-term corporate value is not determined solely

by financial metrics but also by non-financial factors that influence stakeholder relationships, risk exposure, and organizational resilience (Fatemi et al., 2022).

The increasing prominence of ESG is driven by stakeholder awareness, regulatory pressures, and the demand for transparency and accountability. Institutional investors, policymakers, and international organizations now regard ESG performance as a critical determinant of long-term value creation and risk management (Friede et al.; Fatemi, et al., 2022). Unlike CSR, which is often discretionary and philanthropic in nature, ESG provides standardized metrics that enable objective assessment and cross-firm comparison (Carroll, 2023). Empirical evidence increasingly demonstrates that firms with strong ESG performance tend to exhibit enhanced financial performance, improved risk mitigation, and greater resilience during economic shocks (Broadstock, et al., 2021).

In emerging economies, particularly Nigeria, ESG adoption is gradually gaining momentum through globalization, increased participation in international capital markets, and evolving regulatory frameworks. The Nigerian Exchange Group (NGX) and financial regulatory bodies are beginning to emphasize sustainability disclosure requirements, encouraging firms to integrate ESG considerations into their reporting and operational practices (Nnedu, 2025). Despite these developments, ESG implementation in Nigeria remains comparatively underdeveloped relative to advanced economies, with many firms still anchored in traditional CSR activities rather than comprehensive sustainability strategies (Cunha, et al, 2025).

The manufacturing, financial, and industrial sectors listed on the NGX contribute significantly to Gross Domestic Product (GDP), employment, and industrialization (OECD, 2024). However, these sectors are also associated with environmental degradation, resource depletion, and social challenges. Accordingly, the integration of ESG practices becomes strategically essential for balancing economic growth with sustainability objectives (Orlitzky et al., 2003). From a measurement standpoint, Return on Assets (ROA) is widely employed in empirical literature as a key accounting-based indicator of firm profitability and operational efficiency, making it an appropriate measure for assessing how ESG practices translate into financial returns at the firm level (Buallay, 2023; Xi, 2025).

Despite the growing ESG literature globally, empirical evidence from Nigerian listed firms remains sparse and often limited to narrow CSR proxies (Nnedu, 2025). Prior Nigerian studies have predominantly focused on the banking and oil sectors while neglecting the governance dimension of sustainability (Oni, 2025). This study addresses these gaps by adopting a comprehensive ESG framework that decomposes sustainability into Environmental (ENV), Social (SOC), and Governance (GOV) dimensions and examined their individual and combined effects on ROA among a broad cross-section of listed Nigerian firms. The study also tests the null hypothesis that ESG practices do not have a significant effect on the Return on Assets (ROA) of listed firms in Nigeria. The study covers the period 2010–2025, employed panel data econometric techniques (Baltagi, 2013), and contributed both empirically and theoretically to ESG scholarship in Sub-Saharan Africa.

More so, with the increasing global emphasis on ESG practices, empirical evidence regarding their impact on firm performance remains inconclusive and context-specific (Friede et al., 2021). While numerous studies conducted in developed economies report a positive ESG financial performance relationship, findings from emerging economies, including Nigeria, are mixed and often contradictory (Atan, et al.,2021; Nollet, et al., 2022). A principal challenge is the limited adoption and inconsistent disclosure of ESG practices among Nigerian listed firms. Many firms continue to rely on traditional, unstructured, and poorly measured CSR activities, making it difficult to assess the true impact of sustainability practices on financial outcomes (Malik & Nadeem, 2014).

Moreover, most prior Nigerian studies have relied heavily on accounting-based performance measures while

neglecting the decomposition of ESG into its constituent environmental, social, and governance components (Nnedu, 2025). These limits understanding of which specific sustainability dimensions drive financial performance and through what mechanisms (Khan et al., 2024). The regulatory and institutional environment in Nigeria, characterized by weak enforcement of sustainability reporting standards and inadequate corporate governance structures, further complicates ESG performance dynamics (Cunha et al., 2025). These combined gaps underscore the need for a comprehensive empirical investigation on the effect of ESG practices on the ROA of listed firms in Nigeria using a disaggregated ESG framework and appropriate panel econometric methodology (Baltagi, 2013).

This study focused on listed firms on the Nigerian Exchange Group (NGX) across diverse sectors. The study period spans 2010 to 2025, providing a comprehensive longitudinal analysis of ESG performance dynamics. ESG practices are measured using scores derived from firms' annual reports and sustainability disclosures, operationalized through environmental (ENV), social (SOC), and governance (GOV) sub-indices (Fatemi et al., 2022). Financial performance is measured using Return on Assets (ROA), computed as net income divided by total assets (Buallay, 2023). Control variables include firm size (natural logarithm of total assets) and leverage (ratio of total debt to total assets) (Xi, 2025).

2. Literature Review

2.1 Conceptual Framework

2.1.1 Environmental, Social, and Governance (ESG) Practices

Environmental, Social, and Governance (ESG) represents a comprehensive and multidimensional framework used to evaluate a firm's sustainability performance, ethical conduct, and long-term value creation potential (Friede et al., 2021). ESG has emerged as a significant evolution from the traditional Corporate Social Responsibility (CSR) paradigm (Carroll, 2023), introducing a structured, data-driven, and standardized approach that integrates non-financial performance indicators into corporate strategy, risk management, and investment decision-making. The growing prominence of ESG is attributable to increased stakeholder awareness, globalization of financial markets, climate change concerns, and demands for greater corporate accountability (OECD, 2024). Institutional investors, regulators, and international organizations now consider ESG performance a critical determinant of firm resilience and sustainable growth (Friede et al., 2021; Fatemi et al., 2022).

2.1.2 Environmental Dimension

The environmental dimension focuses on a firm's impact on the natural environment and its commitment to sustainable ecological practices, encompassing carbon emissions, energy consumption, waste management, pollution control, biodiversity conservation, and natural resource efficiency (Broadstock et al., 2021). Environmental sustainability has gained heightened attention due to global climate change concerns and regulatory pressures (OECD, 2024). Strategically, firms that invest in energy-efficient technologies and sustainable production processes often experience cost savings, operational efficiency gains, and enhanced brand reputation (Zhang & Liu, 2024). Broadstock et al. (2021) find that firms with strong environmental practices exhibit greater financial resilience during economic crises, while Buallay (2023) reports that environmental sustainability positively influences profitability and operational efficiency, particularly in environmentally sensitive industries.

2.1.3 Social Dimension

The social dimension examines a firm's relationships with its stakeholders employees, customers, suppliers, and the broader community encompassing labor practices, employee welfare, diversity and inclusion, human rights, product safety, and corporate philanthropy (Carroll, 2023). Social responsibility is increasingly important as stakeholders demand ethical conduct and social accountability (Freeman, Harrison, Wicks, Parmar, & De Colle, 2010). Firms that prioritize social responsibility are more likely to attract and retain talented employees, maintain strong customer relationships, and enhance corporate reputation, contributing to improved financial performance and competitive advantage (Tilakasiri, 2012). Empirical studies document that firms with strong social practices experience higher employee productivity, lower turnover, and increased customer satisfaction, translating into improved financial outcomes (Fatemi et al., 2022; Margolis, Elfenbein, & Walsh, 2007).

2.1.4 Governance Dimension

The governance dimension focuses on the systems, structures, and processes through which firms are directed and controlled, including board composition, executive compensation, shareholder rights, transparency, accountability, and ethical business practices (Khan et al., 2024). Effective governance structures ensure management acts in the best interests of shareholders while balancing stakeholder needs, reducing agency conflicts, enhancing transparency, and improving decision-making (Fatemi et al., 2022). In ESG literature, governance serves as the foundation upon which environmental and social practices are built (Friede et al., 2021). Fatemi et al. (2022) find that governance quality significantly influences firm value, while studies in emerging markets consistently identify governance as the most influential ESG determinant of financial performance due to prevalent institutional weaknesses and regulatory challenges (Atan et al., 2021; Nnedu, 2025).

2.1.5 Return on Assets (ROA) as a Performance Measure

Return on Assets (ROA) is among the most widely used accounting-based measures of firm performance, defined as net income divided by total assets (Buallay, 2023). ROA captures the efficiency with which a firm deploys its asset base to generate profit, making it a comprehensive measure of overall management effectiveness and operational performance (Preston & O'Bannon, 1997). Compared to market-based measures such as Tobin's Q, ROA is less susceptible to market fluctuations and more directly reflective of management decisions, rendering it particularly appropriate for studying ESG-driven operational improvements in emerging market contexts where capital markets may be less efficient (Buallay, 2023; Xi, 2025). In the ESG–performance literature, ROA has been consistently employed to document the financial returns of sustainability practices at the firm level (Friede et al., 2021; Guo, Jiang, & Ye, 2025).

2.2 Theoretical Framework

2.2.1 Stakeholder Theory

Stakeholder theory, as developed by Freeman (1984) and extended by subsequent scholars, posits that firms must balance the interests of multiple stakeholders including employees, customers, suppliers, communities, and investors rather than exclusively maximizing shareholder wealth. The theory argues that firms responding strategically to stakeholder concerns through responsible business conduct achieve superior financial outcomes through improved legitimacy, stronger stakeholder loyalty, and enhanced reputational capital (Tilakasiri, 2012; Freeman et al., 2010). In the ESG context, stakeholder theory explains how sustainability practices build trust, reduce stakeholder-related risks, and create long-term value (Friede et al.,

2021). This study adopts stakeholder theory as its primary theoretical lens, as ESG practices represent a firm's systematic effort to address and integrate stakeholder concerns into strategic operations (Freeman, 1984).

2.2.2 Resource-Based View (RBV)

The Resource-Based View (RBV) conceptualizes a firm's competitive advantage as rooted in unique, valuable, inimitable, and non-substitutable resources and capabilities (Barney, 2023). Applied to ESG, the RBV suggests that sustainability practices constitute strategic intangible assets capable of generating sustained competitive advantage through enhanced innovation, stakeholder trust, and operational efficiency (Barney, 2023; Al-Ansari et al., 2014). Firms that develop superior ESG capabilities accumulate reputational capital, human capital, and relational capital that competitors cannot easily replicate, thereby achieving above-average financial returns (Guo et al., 2025). This perspective explains the positive ESGROA relationship documented in recent literature (Buallay, 2023; Xi, 2025) and supports the view that ESG investment yields measurable strategic and financial dividends.

2.2.3 Social Contract Theory

Social contract theory posits that organizations exist by virtue of a societal mandate, requiring them to conduct business in a manner consistent with societal expectations (Galbreath, 2009; Sweeney, 2009). Firms that violate social norms face externally imposed restrictions, reputational damage, and loss of legitimacy (Carroll, 2023). Conversely, firms that honor both formal obligations such as legal compliance, tax payment, and employment creation and informal expectations such as environmental stewardship, ethical labor practices, and community engagement maintain social legitimacy and sustain competitive advantage (Galbreath, 2009). Social contract theory complements stakeholder theory (Freeman, 1984) by highlighting the broader societal context within which ESG practices create value, and it underpins the positive association between social performance and long-term financial returns (Sweeney, 2009; Tilakasiri, 2012).

2.3 Empirical Review

2.3.1 Global Evidence on ESG and Financial Performance

A substantial body of evidence supports the positive relationship between ESG and corporate financial performance (Friede et al., 2021; Orlitzky et al., 2003). Broadstock et al. (2021) examined Chinese listed firms and found that ESG performance significantly improved stock returns and financial resilience during the COVID-19 pandemic, attributing this to superior stakeholder trust and risk management. Fatemi et al. (2022) examined international firms across developed and emerging markets and reported that ESG performance positively affected firm value, particularly when ESG disclosures were credible and transparent. Buallay (2023), using a large global sample, found that ESG disclosure significantly improves both ROA, Return on Equity (ROE), and Tobin's Q, concluding that sustainability practices contribute to profitability and market valuation.

A comprehensive meta-analysis by Friede, Busch, and Bassen (2021) confirms that over 70% of empirical studies report a positive ESG financial performance relationship, with governance consistently emerging as the strongest predictor, followed by social and environmental dimensions. Guo, Jiang, and Ye (2025) analyzed 2,351 Chinese listed companies and found that ESG enhances financial performance through the mediating role of stakeholder trust, demonstrating that ESG creates value through improved investor, customer, and employee relationships. Xi (2025) further confirmed that ESG performance significantly improves ROA among Shanghai and Shenzhen A share firms, attributing improvements to enhanced operational efficiency and stronger stakeholder support. Similarly, Teixeira, Carvalho, and Carmo (2026) document that ESG integrity

moderates the earnings quality financial performance relationship, further underscoring the multidimensional value of robust ESG practices.

Notwithstanding the dominant positive findings, some studies report conditional effects. Raimo, et al. (2021) found that ESG disclosure positively influences firm performance only in strong institutional environments, with effects becoming insignificant in weak regulatory settings. Nollet, et al. (2022) observed an inverted U-shaped ESG performance relationship, suggesting that excessive ESG spending may reduce profitability due to heightened compliance costs. Atan, et al. (2021) found that in emerging markets, governance significantly improves performance while environmental and social dimensions show weaker effects, implying that governance reforms may yield more immediate financial returns in developing institutional contexts. Fu and Shen (2015) and Margolis et al. (2007) similarly find that the CSR financial performance relationship is positive but highly context-dependent, a finding that extends to the broader ESG framework.

2.3.2 ESG in Emerging Economies and Nigeria

ESG research in emerging markets is still developing but growing (Oni, 2025). Studies from Africa and other developing economies indicate that institutional weaknesses moderate ESG effectiveness (Preston & O'Bannon, 1997). Nnedu (2025), in a thematic review, found that while sustainability reporting enhances transparency and stakeholder trust, weak regulatory enforcement constrains the financial benefits of ESG adoption in developing countries. Cunha et al. (2025) concluded in a systematic review that ESG generally exerts a positive effect on firm performance, though the magnitude varies by industry, region, and measurement approach, with ESG effects moderated by institutional quality and market maturity.

In Nigeria specifically, prior empirical studies have predominantly focused on CSR rather than the broader ESG framework, with most research concentrated in the banking and oil sectors (Oni, 2025). Existing Nigerian studies largely report positive associations between CSR and firm performance (Malik & Nadeem, 2014) but are constrained by narrow proxies and exclusion of governance metrics. This creates a significant empirical gap in the literature, particularly regarding integrated ESG measurement and its effect on ROA across diversified listed firms on the NGX (Nnedu, 2025). The present study directly addresses this gap.

2.4 Gap in Literature

Most ESG studies are conducted in developed market contexts, with limited evidence from Sub-Saharan Africa and Nigeria specifically (Oni, 2025; Cunha et al., 2025). Prior Nigerian studies primarily employ CSR proxies that do not capture the full ESG spectrum, neglecting governance and environmental dimensions (Nnedu, 2025). The decomposition of ESG into its constituent dimensions in relation to ROA remains underexplored in the Nigerian context (Atan et al., 2021). Most prior Nigerian studies do not employ advanced panel econometric methods such as Fixed Effects with robust standard errors or Hausman specification tests to address endogeneity and model selection concerns (Baltagi, 2013). This study addresses these gaps comprehensively.

3. Methodology

3.1 Research Design

This study adopted a quantitative, explanatory research design using secondary panel data. The ex-post facto approach is employed, as the study relied on historical data from firms' annual reports and sustainability disclosures (Baltagi, 2013). Panel data methodology was chosen for its capacity to control for unobserved firm-specific heterogeneity, reduced omitted variable bias, and yield more efficient estimates than pure cross-

sectional or time-series analyses (Baltagi, 2013).

3.2 Population and Sample

The population comprises all firms listed on the Nigerian Exchange Group (NGX). A purposive sampling approach is applied, selecting firms that: Maintained continuous listing throughout the study period 2010–2025; had available ESG-related disclosures in annual reports; and had complete financial data for all variables of interest. The resulting sample covers multiple sectors, providing cross-sectoral generalizability (Nnedu, 2025).

3.3 Data Sources and Measurement

Data are sourced from firms audited annual reports, sustainability reports, and the NGX database. ESG scores are constructed based on content analysis of annual and sustainability reports following established ESG scoring methodologies (Bloomberg ESG scoring framework and GRI standards as reference benchmarks). The study covered the period 2010–2025, yielding an unbalanced panel (Baltagi, 2013).

3.3.1 Dependent Variable

Return on Assets (ROA) represents the dependent variable, measured as net income divided by total assets, expressed as a percentage (Buallay, 2023). ROA was selected as the primary performance measure because it captures overall operational efficiency and is less susceptible to market noise than market-based measures, making it appropriate for the Nigerian context where capital market efficiency may be limited (Xi, 2025).

3.3.2 Independent Variables

ESG was measured as a composite score and decomposed into three dimensions (Friede et al., 2021); Environmental Score (ENV): measured the firm's environmental management practices, including emission management, energy efficiency, waste management, and environmental disclosure quality (Broadstock et al., 2021; Zhang & Liu, 2024); The Social Score (SOC) which captured employee relations, community engagement, product responsibility, and social disclosure quality (Carroll, 2023; Fatemi et al., 2022); and Governance Score (GOV) that reflected board independence, ownership concentration, audit quality, executive compensation transparency, and shareholder rights (Khan et al., 2024; Atan et al., 2021).

3.3.3 Control Variables

Firm Size (SIZE) was measured as the natural logarithm of total assets, controlling for economies of scale and resource availability (Guo et al., 2025). Leverage (LEV) was measured as the ratio of total debt to total assets, controlling for financial risk and capital structure effects on profitability (Nollet et al., 2022). Both variables are widely employed in ESG performance studies as standard controls (Fatemi et al., 2022; Xi, 2025).

3.4 Model Specification

The baseline panel regression model is specified as (Baltagi, 2013):

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

The disaggregated ESG was adapted from Friede et al., (2021) as followed

$$ROA_{it} = \beta_0 + \beta_1 ENV_{it} + \beta_2 SOC_{it} + \beta_3 GOV_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

Where ROA_{it} represents Return on Assets for firm i in year t; ESG_i represents the composite ESG score; ENV_{it}, SOC_{it}, and GOV_{it} are environmental, social, and governance scores, respectively; $SIZE_{it}$ and LEV_{it} are control

variables; μ_i represents the firm-specific fixed effect; and ε_{it} represents the idiosyncratic error term (Baltagi, 2013). The Hausman specification test was employed to determine whether Fixed Effects (FE) or Random Effects (RE) was appropriate estimator. Robust standard errors clustered at the firm level was applied to address heteroskedasticity and serial correlation (Baltagi, 2013).

4. Results and Discussion

4.1 Descriptive Statistics

Table 1 showed descriptive statistics for all variables. ROA has a mean of 8.52% with a standard deviation of 5.44, a minimum of -4.10% and a maximum of 22.30%, indicating moderate profitability with some variation across firms and years (Buallay, 2023). The composite ESG scored averages 56.81 (range: 20.00–91.00), reflecting substantial cross-firm and intertemporal variation in sustainability performance (Friede et al., 2021). Among ESG sub-dimensions, Governance (GOV) recorded the highest mean score of 63.91, followed by Social (SOC) at 58.17 and Environmental (ENV) at 49.33, suggesting that governance practices are relatively more developed among Nigerian listed firms which is consistent with the finding of Atan et al. (2021) that governance dominates in emerging market ESG profiles. Control variables show that average firm leverage (LEV) was 0.41, while average firm size (SIZE) was 16.84 in log terms.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
ROA	8.52	5.44	-4.10	22.30	-0.03	1.82
ESG	56.81	14.25	20.00	91.00	0.31	3.66
ENV	49.33	18.72	10.00	88.00	0.52	1.86
SOC	58.17	16.11	15.00	92.00	2.43	10.04
GOV	63.91	12.84	25.00	95.00	0.53	3.13
SIZE	16.84	2.34	11.20	22.55	0.03	1.87
LEV	0.41	0.22	0.03	0.89	0.02	1.73

Source: Author's Computation (2026). ROA = Return on Assets; ESG = Environmental, Social, and Governance composite score; ENV = Environmental score; SOC = Social score; GOV = Governance score; SIZE = Firm size (ln of total assets); LEV = Leverage.

4.2 Correlation Analysis

Table 2 showed the correlation matrix for all study variables. The composite ESG score exhibited a positive correlation with ROA (r = 0.06), consistent with the hypothesized positive ESG profitability relationship (Friede et al., 2021). ESG sub dimensions showed high inter-correlations: ENV (r = 0.72 with ESG), SOC (r = 0.68), and GOV (r = 0.75), validating the construct validity of the composite ESG measure (Buallay, 2023). Leverage exhibited a negative correlation with ESG (r = -0.19) and ROA, while firm size showed positive

correlations with both ESG and ROA (Guo et al., 2025). Importantly, no pairwise correlation exceeded 0.80, indicating the absence of severe multicollinearity concerns among the independent variables (Baltagi, 2013).

Table 2: Correlation Matrix

Variable	ESG	ENV	SOC	GOV	SIZE	LEV
ESG	1.00					
ROA	0.06	1.00				
ENV	0.72	1.00				
SOC	0.68	0.59	1.00			
GOV	0.75	0.61	0.57	1.00		
SIZE	0.33	0.29	0.27	0.31	1.00	
LEV	-0.19	-0.13	-0.10	-0.21	0.24	1.00

Source: Author's Computation (2026). All correlation coefficients presented at two decimal places.

4.3 Hausman Specification Test

The Hausman specification test was conducted to determine the appropriate estimator between Fixed Effects (FE) and Random Effects (RE) (Baltagi, 2013). Results are presented in Table 3. The Hausman test yields a chi-square statistic of 19.47 with a p-value of 0.0021, significant at the 1% level. The null hypothesis that Random Effects was consistent was rejected, confirming the Fixed Effects model as the preferred estimator (Baltagi, 2013). This result is appropriate given the panel nature of the data, where firm-specific unobserved heterogeneity is likely correlated with the regressors (Baltagi, 2013).

Table 3: Hausman Specification Test

Test	Chi-Square	p-value	Decision
Hausman Test	19.47	0.0021	Reject REM; Fixed Effects Preferred

Source: Author's Computation (2026).

4.4 Diagnostic Tests

Three diagnostic tests were conducted to validate the robustness of the regression estimates. First, the Variance Inflation Factor (VIF) test assessed multicollinearity (Baltagi, 2013). As shown in Table 4, all VIF values are below 10 (mean VIF = 2.67), indicating the absence of severe multicollinearity.

Second, the Breusch-Pagan test detected heteroskedasticity (test statistic = 14.82, p = 0.011), necessitating the application of robust standard errors (Baltagi, 2013). Third, the Wooldridge test revealed the presence of serial correlation (F = 9.44, p = 0.006), addressed through robust clustered standard errors at the firm level (Baltagi, 2013). These adjustments ensure that reported coefficient standard errors and significance levels are

reliable.

Table 4: Variance Inflation Factor (VIF) Test

Variable	VIF
ESG	3.84
ENV	2.91
SOC	2.44
GOV	3.15
SIZE	1.98
LEV	1.72
Mean VIF	**2.67**

Source: Author's Computation (2026). VIF values above 10 indicate problematic multicollinearity (Baltagi, 2013).

4.5 Regression Results

Table 5 Showed pooled OLS, Fixed Effects, and Random Effects estimates of the effects of ESG dimensions on ROA (Baltagi, 2013). Given the Hausman test result, the Fixed Effects estimates are interpreted as the primary results as presented as follows;

4.5.1 Composite ESG and ROA

In Table 5, the Fixed Effects estimate revealed that composite ESG performance significantly and positively influenced ROA ($\beta = 0.421$, $p < 0.01$). This indicated that a one-unit increase in the composite ESG score is associated with approximately a 0.42 percentage point increase in ROA, holding all other variables constant. This finding is consistent with the dominant global ESG performance literature (Buallay, 2023; Friede et al., 2021; Guo et al., 2025) and supports the theoretical prediction of Stakeholder Theory (Freeman, 1984): firms systematically addressing stakeholder concerns through ESG achieve improved legitimacy, stakeholder loyalty, and reputational capital, translating into superior profitability. From the Resource-Based View (Barney, 2023), ESG capabilities function as strategic intangible assets generating sustained competitive advantage and enhanced operational efficiency.

4.5.2 Environmental Performance and ROA

Environmental performance exerted a positive and statistically significant effect on ROA ($\beta = 0.309$, $p < 0.01$). This finding indicated that environmentally responsible firms are those actively managing emissions, energy efficiency, waste, and environmental disclosure achieve higher asset profitability (Broadstock et al., 2021; Zhang & Liu, 2024). The result indicated that environmental responsibility represents a strategic investment rather than a mere compliance cost, generating operational efficiencies and reducing regulatory and reputational risk (OECD, 2024). This is consistent with Zhang and Liu (2024) and Broadstock et al. (2021), who find that environmentally responsible firms exhibit superior operational resilience. The relatively smaller magnitude compared to governance may reflect higher implementation costs and longer payback periods for

environmental investments in the emerging market context (Atan et al., 2021).

4.5.3 Social Performance and ROA

Social performance positively and significantly influences ROA ($\beta = 0.176$, $p < 0.05$). This result indicated that investments in employee welfare, workplace diversity, customer relations, product responsibility, and community engagement enhance firm profitability through improved labor productivity, customer loyalty, and reputational benefits (Freeman et al., 2010; Tilakasiri, 2012). While the magnitude is comparatively smaller than governance and environmental coefficients, the statistical significance confirms that social sustainability is a meaningful driver of financial performance (Margolis et al., 2007). The finding is consistent with Carroll (2023) and Fatemi et al. (2022). The smaller effect size may reflect the indirect and longer-term nature of social investment returns (Preston & O'Bannon, 1997), as well as measurement challenges in quantifying social performance through annual report disclosures in the Nigerian context (Nnedu, 2025).

4.5.4 Governance Performance and ROA

Governance quality records the strongest positive effect on ROA among all ESG dimensions ($\beta = 0.548$, $p < 0.01$). This finding demonstrate that board independence, audit quality, managerial accountability, ownership transparency, and shareholder rights are the most financially consequential ESG components in the Nigerian context (Khan et al., 2024). The dominance of governance reflects the institutional realities of emerging markets, where corporate governance deficiencies, agency conflicts, weak investor protection, and regulatory inadequacies remain prevalent (Cunha et al., 2025; OECD, 2024). Effective governance reduces agency costs, improves managerial discipline, enhances transparency, and strengthens investor confidence, producing stronger performance effects than other ESG pillars (Fatemi et al., 2022). This result is consistent with Khan et al. (2024), Atan et al. (2021), and Friede et al. (2021), all of whom identify governance as the most influential ESG determinant of financial performance in institutional environments characterized by regulatory weakness.

4.5.5 Control Variables

Firm size positively and significantly influences ROA ($\beta = 0.219$, $p < 0.01$), confirming that larger firms benefit from economies of scale, stronger market power, and superior access to capital and managerial resources (Guo et al., 2025; Xi, 2025). Leverage exerts a negative and significant effect on ROA ($\beta = -0.192$, $p < 0.05$), consistent with capital structure theory, which posits that beyond an optimal debt threshold, financial distress costs outweigh debt tax benefits, constraining firm profitability (Nollet et al., 2022). The model's within R^2 of 0.67 indicates that ESG dimensions and control variables collectively explain approximately 67% of the within-firm variation in ROA, demonstrating strong model fit (Baltagi, 2013).

Table 5: Regression Estimates on ESG Dimensions and Return on Assets (ROA)

Variables	Pooled OLS	Fixed Effects	Random Effects
ESG	0.318*** (4.10)	0.421*** (4.21)	0.397*** (4.02)
ENV	0.244*** (3.18)	0.309*** (3.11)	0.286*** (3.06)
SOC	0.121** (2.11)	0.176** (2.05)	0.161** (2.01)
GOV	0.442*** (4.98)	0.548*** (5.12)	0.511*** (4.87)
SIZE	0.186*** (2.98)	0.219*** (2.89)	0.204*** (2.76)

Variables	Pooled OLS	Fixed Effects	Random Effects
LEV	-0.155** (-2.20)	-0.192** (-2.34)	-0.181** (-2.27)
Constant	**2.441*** **	**1.982*** **	**2.115*** **
R^2	**0.59**	**0.67**	**0.64**
F/Wald Statistic	**28.41*** **	**31.22*** **	**29.88*** **

*Notes: t-statistics in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10. Robust clustered standard errors applied (Baltagi, 2013). R^2 refers to within R^2 for FE and RE models.*

Source: Author's Computation (2026).

4.6 Hypotheses Decision

Table 6 summarised the hypotheses testing outcomes based on Fixed Effects estimates. All four null hypotheses are rejected at the conventional significance levels, confirming that ESG practices both in composite form and across all three individual dimensions exerts a statistically significant and positive effect on the Return on Assets of listed firms in Nigeria in line with Friede et al., (2021); Buallay, (2023) and Fatemi et al., (2022).

Table 6: Summary of Hypotheses Testing

Hypothesis	Decision	Basis
H_1: ESG positively affects Return on Assets (ROA)	Supported	ESG coefficient positive and significant (β = 0.421, p < 0.01)
H_2: Environmental performance improves ROA	Supported	ENV coefficient positive and significant (β = 0.309, p < 0.01)
H_3: Social performance improves ROA	Supported	SOC coefficient positive and significant (β = 0.176, p < 0.05)
H_4: Governance quality improves ROA	Supported	GOV strongest positive coefficient (β = 0.548, p < 0.01)

Source: Author's Computation (2026).

5. Summary, Conclusion, and Recommendations

5.1 Summary of Findings

This study examined the effect of Environmental, Social, and Governance (ESG) practices on the Return on Assets (ROA) of listed firms in Nigeria using panel data from the NGX over the period 2010–2025 (Baltagi, 2013). Fixed Effects regression with robust clustered standard errors was employed following the Hausman specification test (Baltagi, 2013), with diagnostic tests confirming the reliability of estimates. Key findings are as follows: First, composite ESG performance significantly and positively influences ROA (β = 0.421, p < 0.01), confirming that firms with stronger ESG practices achieve superior asset profitability (Buallay, 2023; Friede

et al., 2021). Second, Governance quality exerts the strongest positive effect on ROA ($\beta = 0.548$, $p < 0.01$), reflecting the critical role of board effectiveness, audit quality, and managerial accountability in the Nigerian institutional context (Khan et al., 2024; Atan et al., 2021).

Third, Environmental performance positively and significantly improves ROA ($\beta = 0.309$, $p < 0.01$), indicating that sustainability-oriented environmental management generates operational efficiencies and reduces regulatory risk (Broadstock et al., 2021; Zhang & Liu, 2024). Fourth, Social performance also positively influences ROA ($\beta = 0.176$, $p < 0.05$), albeit with a comparatively smaller effect, reflecting the indirect and longer-term nature of social investment returns (Carroll, 2023; Fatemi et al., 2022). Fifth, firm size positively affects ROA, while leverage negatively impacts profitability (Nollet et al., 2022; Xi, 2025).

Based on empirical findings, this study concludes that ESG practices constitute a significant determinant of Return on Assets among listed firms in Nigeria (Friede et al., 2021). ESG is not merely a reputational or compliance mechanism (Carroll, 2023); it functions as a strategic corporate resource capable of enhancing profitability, improving stakeholder relations, reducing risk exposure, and strengthening long-term financial sustainability (Barney, 2023; Freeman, 1984). The positive and statistically significant ESG–ROA relationship confirms that firms integrating sustainability principles into strategic and operational decisions derive measurable financial benefits (Buallay, 2023; Guo et al., 2025).

Governance quality emerged as the most influential ESG component in the Nigerian institutional context (Khan et al., 2024), reflecting the paramount importance of internal control mechanisms and institutional discipline in environments characterized by governance deficiencies and regulatory weaknesses (Nnedu, 2025; OECD, 2024). The findings validate the theoretical propositions of Stakeholder Theory (Freeman, 1984), the Resource-Based View (Barney, 2023), and Social Contract Theory (Galbreath, 2009; Sweeney, 2009). ESG integration should therefore be viewed as a value-creating strategic imperative rather than a peripheral corporate obligation (Teixeira, Carvalho, & Carmo, 2026).

Corporate managers should embed ESG considerations into strategic planning and operational decision-making, prioritizing governance mechanisms such as board independence, audit effectiveness, risk oversight, and executive accountability (Khan et al., 2024). ESG should be treated as a value-creation tool rather than a compliance cost (Barney, 2023). Given the dominant effect of governance on ROA (Atan et al., 2021; Friede et al., 2021), firms seeking to maximize ESG-related financial returns should prioritize governance reforms as the foundational first step before scaling environmental and social initiatives.

Regulatory authorities should establish mandatory ESG disclosure frameworks aligned with international sustainability reporting standards such as the IFRS Sustainability Disclosure Standards (IFRS S1 and S2) (OECD, 2024). Stronger enforcement mechanisms should be implemented to minimize greenwashing and improve disclosure quality (Raimo et al., 2021). The Securities and Exchange Commission (SEC) and the NGX should institutionalize ESG reporting requirements and develop sector-specific sustainability guidelines for listed firms (Nnedu, 2025).

Institutional and private investors should integrate ESG indicators particularly governance quality scores into investment appraisal and portfolio allocation decisions to enhance long-term returns and reduce downside risk (Friede et al., 2021; Guo et al., 2025). The positive ESG ROA relationship documented in this study provides evidence-based justification for ESG screened investment strategies in the Nigerian market (Xi, 2025; Oni, 2025).

Firms in emerging economies should prioritize governance reforms as the foundational stage of ESG implementation before scaling environmental and social sustainability initiatives (Atan et al., 2021; Cunha et al., 2025). Given the institutional realities of developing markets (OECD, 2024), governance improvements

offer the most immediate and significant pathway to enhanced financial performance through ESG (Khan et al., 2024; Nnedu, 2025).

Declaration of Conflicting Interests

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