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Research paper

Moderating Effects of Profitability on The Relationship between ESG Reporting and Earnings Quality in African Manufacturing Firms

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Abstract

This study examines the impact of Environmental, Social and Governance (ESG) reporting on earnings quality of African listed manufacturing firms while adopting profitability, proxied by Return on Assets (ROA) and Return on Equity (ROE), as a moderating variable. Adopting an ex post facto research design and panel data of 49 firms over the period 2012-2023, the study applies fixed-effects regression with robust standard errors to account for firm-specific heterogeneity. It is found that the effect of ESG reporting on earnings quality is not uniform for the three proxies: JMAQ, MJEQ, and DAEQ. Environmental reporting strengthens accruals magnitude-based JMAQ, but weakens accrual-based MJEQ and DAEQ, emphasizing differences between substantive and symbolic disclosure. The social and governance disclosures also have mixed results, suggesting that the quality of disclosure is related to the genuineness of the practice behind it. ROA exerts a positive impact on the quality of earnings in the ESG-earnings quality relation in all firms, which implies that financially strong firms have greater potential to turn their ESG engagements into believable reporting. On the other hand, ROE exhibits weaker and inconsistent interaction effects. The study indicates the central importance of profitability in determining whether ESG reporting will strengthen or weaken earnings quality for African manufacturing firms and suggests that stronger governance monitoring, the convergence of ESG disclosure standards, and the introduction of mandatory assurance regimes should be incorporated moving forward to support credible sustainability reporting.

Keywords: *Earnings Quality; ESG Reporting; Return on Assets; Return on Equity; Manufacturing Firms.*

1. Introduction

Financial reporting requires firms to balance transparency with the inherent limits of financial statements, which often fail to fully capture underlying economic realities (Abu-Hamour et al., 2024; Alharasis et al., 2024). The credibility of reported financial information is, therefore, central to efficient resource allocation, firm valuation, and informed decision making (Fonou-Dombeu & Nomlala, 2023; Biehl et al., 2024). Within African manufacturing firms, however, persistent challenges such as earnings manipulation, weak governance structures, and inconsistent disclosure practices continue to undermine reporting credibility (Adeyemi & Yahaya, 2024; Chigbo et al., 2021). These deficiencies erode earnings quality, weaken investor confidence, and ultimately impair market efficiency and financial stability (Adeniran et al., 2024; Essien & Akpan, 2024).

Earnings quality reflects the extent to which reported earnings faithfully represent a firm's underlying economic performance and remains a critical benchmark for assessing financial reporting reliability (Adeniran et al., 2024). In many African firms, however, weak institutional frameworks, inadequate regulatory enforcement, limited monitoring capacity, and wide managerial discretion have encouraged earnings management through discretionary accruals and reporting adjustments (Alvin & Susanto, 2022; Ricciardi et al., 2024). While firm-specific characteristics such as size and ownership structure influence reporting behavior, prior evidence suggests that these factors alone are insufficient to resolve deeper governance and ethical challenges embedded within the reporting environment (Andrew et al., 2023; Fonou Dombeu & Nomlala, 2023).

In response to declining confidence in conventional financial reporting, firms have increasingly adopted Environmental, Social, and Governance (ESG) reporting as a complementary mechanism for enhancing transparency and accountability. ESG reporting integrates ethical, social, and environmental considerations into corporate disclosure, with the potential to constrain opportunistic behavior and promote responsible governance (Fatemi et al., 2018; Githaiga, 2023). Empirical studies indicate that firms with stronger ESG engagement tend to exhibit lower levels of earnings management and more effective governance structures (Ampedu et al., 2024; Igbinovia & Agbadua, 2023). However, despite growing global adoption, ESG implementation in Africa remains at an early and uneven stage, with sustainability reporting often driven by reputational concerns rather than substantive governance reform or operational integration (Kogi et al., 2025; Steurer et al., 2024). This has raised concerns that ESG disclosures in weak regulatory environments may be symbolic, selective, or poorly enforced, thereby producing inconsistent effects on earnings quality.

Profitability further shapes the credibility and effectiveness of ESG disclosure. Measures such as return on assets (ROA) and return on equity (ROE) capture a firm's capacity to finance sustainability initiatives and embed ESG practices within core operations (Fatemi et al., 2018; Wei et al., 2023). Firms with stronger profitability are generally perceived as more credible in their ESG commitments, while financially constrained firms may rely on symbolic disclosure to signal compliance without substantive changes to reporting behavior (Qian, 2024). Despite its relevance, profitability has largely been treated as a control variable in prior studies, and its moderating role in the ESG–earnings quality relationship remains insufficiently examined, particularly within African manufacturing contexts characterized by weak enforcement and voluntary disclosure regimes (Igbinovia & Agbadua, 2023; Primacintya & Kusuma, 2025).

Against this background, this study investigates the impact of ESG disclosure on the earnings quality of manufacturing firms in Africa, with particular emphasis on the moderating role of profitability proxied by ROA and ROE. By employing multiple accrual-based earnings quality measures, the study acknowledges that ESG dimensions may influence different facets of earnings quality in divergent ways, reflecting the distinction between substantive and symbolic disclosure practices. Firm size and managerial ownership are included as control variables to account for structural and governance-related influences. In line with the study objectives, the following null hypotheses are tested:

Ho_1: Environmental reporting has no significant effect on the earnings quality of African manufacturing firms.

Ho_2: Social reporting has no significant effect on the earnings quality of African manufacturing firms.

Ho_3: Governance reporting has no significant effect on the earnings quality of African manufacturing firms.

Ho_4: ROA and ROE do not significantly moderate the relationship between ESG reporting and earnings quality among African manufacturing firms.

2. Literature Review

This section reviews Stakeholder Theory, Signaling Theory, and Agency Theory, and selects the best suited for the underpinning of this study. It also extensively reviewed the relevant variables, which elicited the establishment of the gaps filled by this study.

2.1. Stakeholder theory

Stakeholder theory (Freeman, 1984) argues that instead of existing solely for its shareholders, a firm is embedded in relationships among its shareholders, employees, customers, regulators, suppliers, and society at large, and its success over the long term is dependent upon treating such parties ethically and with a degree of transparency (Fatemi et al., 2018; Mohmed et al., 2019). The theory of accountability to and responsiveness of stakeholders can also enhance sustainability and non-financial reporting, such as Environmental Social and Governance (ESG) reporting (Githaiga, 2023; Masmoudi, 2024). The adoption of ESG reporting signals the firms' commitment to responsible conduct of business and creation of stakeholder value, leading to reduced opportunistic earnings management and improved earnings quality (Igbinovia & Agbadua, 2023; Tohang et al., 2024). In the case of this research, stakeholder theory is fitting in describing why manufacturing firms in Africa might engage in voluntary disclosure of ESG information to gain legitimacy, increase transparency, and attract investment". Although the prioritization of stakeholder interests, subject to its vagueness, has earned theory criticism (Kogi et al., 2025), it still serves as a valuable perspective through which to examine the manner in which organizations seek to complement ethical responsibility with financial returns so as to achieve corporate sustainability.

2.2. Signaling theory

Information asymmetry is inherent to signaling theory (Spence, 1973), which elucidates the process through which informed parties convey credible information to less-informed parties, thereby mitigating uncertainty in an environment laden with asymmetric information. In the corporate world, companies employ disclosures to signal their quality, ethics, and long-term prospects to shareholders and other stakeholders (Fatemi et al., 2018; Primacintya & Kusuma, 2025). Because credible signals are expensive to imitate, the theory predicts that only superior firms can continually send credible signals, such as with earning transparency, sustainability, and good governance (Qian, 2024; Tohang et al., 2024). In the domain of ESG, voluntary sustainability reporting signals a firm's commitment to responsible management, legal compliance, and ethical accountability (especially in countries characterized by institutional voids and low investor confidence levels (Githaiga, 2023; Masmoudi, 2024). Profitability also adds to signing credibility since a financially sound company can more easily get away with faking good ESG efforts and disclosures of lower quality (Adoğmuş et al., 2022; Wei et al., 2023). Signaling theory, therefore, supports the current research in describing the process of how ESG reporting and profitability combined affect earnings quality and, as a result, disclosure is motivated to be viewed as an information tool reducing uncertainty and enhancing reputation. The fact that such assertions have not been validated may act to discourage shareholders from believing in ESG claims (Fatemi et al., 2018; Githaiga, 2023).

2.3. Agency theory

Agency theory was initially proposed by Jensen and Meckling (1976) and addresses the conflicts of interest between principals (shareholders) and agents (managers), which has relevance for corporate governance. The theory posits that the managers' own objectives may not be aligned with increasing shareholders' wealth, which further leads to agency-related problems, including earnings management, risk-taking, and disclosure in an opportunistic way (Fatemi et al., 2018; Qian, 2024). The interests of managers and shareholders are to be aligned by corporate governance mechanisms, such as monitoring, the structure of ownership, and informationally transparent reporting, to reduce the conflict of interest between them (Tohang et al., 2024). About ESG reporting, agency theory also justifies the choice for firms to voluntarily disclose further sustainability-related information by signaling on managerial accountability, ethics/fairness, and stakeholder considerations, among others, ultimately assisting in reducing information asymmetry and increasing earnings quality (Primacintya & Kusuma, 2025; Githaiga, 2023). Thus, the positive impact of profitability on this relationship may also imply that profitable organizations possess the ability to make strategic changes and thereby increase the level of congruence, whereas non-profitable organizations may pretend to be working towards mitigating the agency risk through symbolic responses (Adoğmuş et al., 2022; Wei et al., 2023). Criticism that agency theory might be overly focused on economic motivations and discounting social or ethical factors aside, it is still extremely applicable to consider the impact of ESG reporting and profit in terms of increased transparency and reduction of managerial opportunism in the context of manufacturing firms in Africa (Fatemi et al., 2018; Igbinovia & Agbadua, 2023).

In line with the reviews of these theories and the necessary relevance and interconnectivity to the variables reviewed, this study, therefore, adopts stakeholder theory, signaling theory, and agency theory for the underpinning.

2.2. Conceptual review

2.1.1. Environmental reporting and earnings quality

Environmental reporting represents a core dimension of corporate transparency and accountability, and firms that provide credible environmental information are generally associated with higher earnings quality and lower levels of earnings management (Masmoudi, 2024; Zeng et al., 2024). Disclosures relating to carbon emissions, waste management, and energy efficiency have been shown to constrain discretionary accruals and enhance the reliability of financial statements by limiting managerial opportunism (Shan et al., 2024). Evidence from emerging and African contexts further suggests that firms adopting environmental strategies benefit from improved investor confidence, stronger reputational capital, and reduced income-smoothing behavior, thereby promoting greater financial discipline (Githaiga, 2023; Igbinovia & Agbadua, 2023).

However, the strength and direction of this relationship remain highly context dependent. Within African manufacturing firms, environmental disclosure is predominantly voluntary, regulatory enforcement is weak, and standardized reporting frameworks are largely absent. These conditions reduce comparability across firms and create incentives for selective disclosure, where environmental information is reported symbolically rather than embedded in operational practices (Kogi et al., 2025; Steurer et al., 2024). As a result, environmental reporting may not consistently translate into improved earnings quality, particularly when disclosures are used to signal compliance or legitimacy without substantive changes to production processes or environmental performance. This ambiguity underscores the need to examine environmental disclosure effects within institutional settings characterized by limited enforcement and uneven reporting practices.

2.2.2. Social reporting and earning quality

Social reporting, encompassing employee welfare, equity, occupational health and safety, and community engagement, has emerged as a key mechanism for ethical accountability and earnings predictability in the ESG literature (Ampedu et al., 2024; Githaiga, 2023). Empirical evidence indicates that firms with more extensive social disclosure tend to exhibit lower levels of earnings management and higher reporting quality, as transparency in social performance reflects an integrity-oriented organizational culture that extends to financial reporting practices (Primacintya & Kusuma, 2025; Masmoudi, 2024). Studies focusing on African firms further suggest that socially responsible organizations benefit from enhanced investor confidence and adopt more conservative earnings behavior in response to reputational considerations and regulatory scrutiny (Ampedu et al., 2024).

Notwithstanding these findings, the effectiveness of social reporting is strongly conditioned by institutional quality. In many African economies, where disclosure remains largely voluntary and enforcement mechanisms are weak, social reporting may degenerate into selective transparency or "social-washing," with firms emphasizing favorable narratives while omitting material deficiencies (Tohang et al., 2024; Kogi et al., 2025; Steurer et al., 2024). Under such conditions, social disclosures may function as symbolic signals rather than credible indicators of internal governance discipline, thereby weakening their ability to improve earnings quality. Consequently, although a positive relationship between social reporting and earnings quality is theoretically plausible, its empirical realization in African manufacturing firms depends critically on the authenticity of disclosures and the strength of underlying governance structures.

2.2.3. Governance reporting and earnings quality

Governance reporting is directly relevant to earnings quality because it promotes transparency, ethical control, and accountability in corporate management. By disclosing information on board structure, oversight mechanisms, and internal controls, firms can strengthen investor trust and constrain managerial opportunism that often leads to earnings manipulation (Tohang et al., 2024; Fatemi et al., 2018). Empirical evidence supports this view, showing that stronger governance disclosures are associated with more persistent and conservative earnings. For example, greater board independence and effective audit committee oversight have been found to improve financial reporting quality (El Ghoul et al., 2022), while increased governance transparency reduces reputational risks linked to earnings distortion, particularly in frontier markets where formal enforcement is limited (Masmoudi, 2024).

Despite these benefits, the effectiveness of governance reporting is often constrained by contextual factors within African capital markets. Governance disclosures among listed firms frequently reflect formal compliance rather than substantive oversight, as enforcement mechanisms remain weak and sanctions for non-compliance are limited (Kogi et al., 2025). In such environments, firms may rely on symbolic or boilerplate governance statements to satisfy stakeholder expectations without strengthening internal monitoring or accountability structures (Steurer et al., 2024; Aljifri & Elrazaz, 2024). Moreover, the aggregation of governance indicators into composite ESG scores obscures the distinct role of governance mechanisms in shaping earnings quality, making it difficult to isolate their true impact on financial reporting outcomes. These limitations suggest that governance disclosure improves earnings quality only when it is supported by effective enforcement and genuine internal control practices rather than symbolic compliance.

2.2.4. Profitability (return on assets), ESG reporting, and earnings quality

Profitability, commonly proxied by return on assets (ROA) and return on equity (ROE), plays a critical moderating role in the relationship between ESG reporting and earnings quality by shaping a firm's capacity to implement and sustain responsible practices (Adoğmuş et al., 2022; Wei et al., 2023). Prior studies indicate that financially successful firms are more likely to produce credible ESG disclosures and transparent earnings reports, as greater resource availability and reputational concerns reduce incentives for opportunistic reporting and earnings management (Qian, 2024; Fatemi et al., 2018). In contrast, less profitable firms may strategically rely on ESG disclosures to offset weak financial performance, using symbolic sustainability narratives rather than embedding ESG commitments into operational processes (Qian, 2024).

This moderating role of profitability is particularly salient in the African manufacturing sector, where limited financial capacity constrains firms' ability to convert ESG intentions into substantive actions. Firms with low profitability often face difficulties financing environmental investments, employee welfare initiatives, and governance reforms, resulting in fragmented or selective disclosure practices that weaken reporting credibility (Kogi et al., 2025; Igbinovia & Agbadua, 2023). Despite its theoretical relevance, profitability has largely been treated as a control variable in prior ESG–earnings quality research, with limited attention given to its interaction with disclosure behavior. By explicitly modeling ROA and ROE as moderating variables, this study extends existing literature and provides deeper insight into how financial capacity conditions the effectiveness of ESG reporting in enhancing earnings quality among African manufacturing firms.

2.3. Gaps in literature

Although prior studies have examined the relationship between ESG disclosure and earnings quality, the literature remains characterized by mixed and often contradictory findings, particularly across different ESG dimensions and earnings quality proxies. Conceptually, existing studies provide limited clarity on why environmental, social, and governance disclosures yield opposing effects under alternative accrual-based measures, leaving unresolved the distinction between substantive and symbolic disclosure practices. Methodologically, most African-based studies treat profitability as a control variable rather than as a conditioning mechanism, thereby overlooking its potential role in determining when ESG disclosure enhances earnings credibility. Contextually, the African manufacturing sector remains underexplored despite its exposure to weak regulatory enforcement, voluntary disclosure regimes, and governance constraints that differ markedly from developed markets. Theoretically, while stakeholder, signaling, and agency theories explain why ESG disclosure may influence earnings quality, they do not sufficiently address the financial conditions under which such disclosures become credible. This study addresses these gaps by modelling profitability as a moderating variable and employing multiple accrual-based earnings quality measures to examine the contingent effects of ESG disclosure among African manufacturing firms.

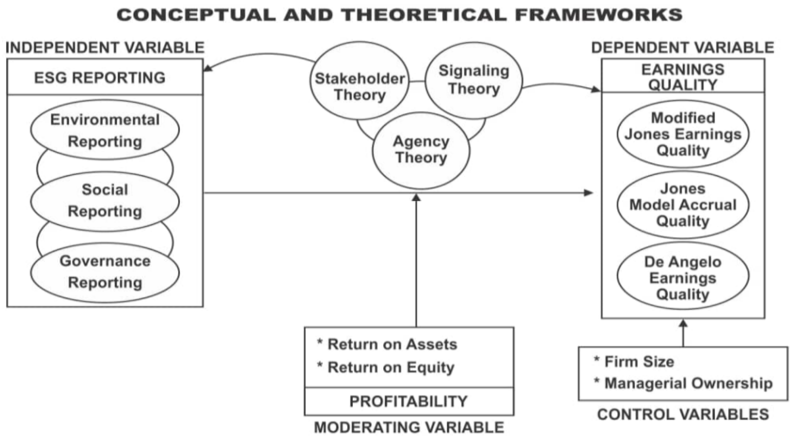

Fig. 1: Conceptual and Theoretical Frameworks.

Source: Authors' Conceptual and Theoretical Frameworks (2025).

3. Methodology

The study adopted an ex post facto research design and employed a panel data methodology to examine listed manufacturing firms across selected African countries over the period 2012–2023, allowing for analysis of both cross-sectional and time-series variations. The population comprised all manufacturing firms listed on African stock exchanges during the study period, from which firms were purposively selected based on the availability of consistent financial statements and ESG-related disclosures. Data were obtained from the Machame Ratios Data PC, a firm-level database providing standardized information on accounting ratios, ESG indicators, profitability measures, and governance attributes for African manufacturing firms. The use of this data source ensures consistency in variable measurement and enhances the reliability of the analysis, as it incorporates comprehensive indicators of earnings quality, environmental, social, and governance performance, as well as control variables such as firm size and managerial ownership.

Table 1: Measurement of Variables

Variable Type	Variable Name	Measurement	Sources
Dependent Variable	Modified Jones Earning Quality (Modified Jones)	(Profit after tax – net cash flows from operating activities) / total assets (lagged)] minus [1/total assets (lagged)] minus [(change in revenue – change in trade receivables) / total assets, lagged] minus [fixed assets / lagged total assets].	Fonou-Dombey et al. (2022); Ricciardi et al. (2024)
Independent Variable	Environmental Reporting	Environmental disclosure index (coded based on content analysis of ESG-related reports)	Masmoudi (2024); Igbinovia & Agbadua (2023)
Independent Variable	Social Reporting	Social disclosure index (coded based on CSR/community/staff welfare indicators)	Ampedu et al. (2024); Primacintya & Kusuma (2025)
Independent Variable	Governance Reporting	Governance disclosure index (based on board structure, independence, and policies)	Tohang et al. (2024); Yahaya (2025)
Moderating Variable	Profitability (ROA)	Net Income / Total Assets	Adoğmuş et al. (2022); Wei et al. (2023)
Moderating Variable	Profitability (ROE)	Net Income / Shareholders' Equity	Qian (2024); Wei et al. (2023)
Control Variable	Firm Size	Log of Total Assets	Andrew et al. (2023); Valdiansyah & Murwaningsari (2022)
Control Variable	Managerial Ownership	Percentage of total shares held by executive directors or firm managers	Andrew et al. (2023); Yahaya (2025)

Source: Authors' Compilation (2025).

3.1. Model specification

Earnings Quality (EQ) was considered the dependent variable, and it was proxied by Modified Jones Earnings Quality (MJEQ), Jones Model Accrual Quality (JMAQ), and DeAngelo Earnings Quality (DAEQ). The paper adapted and modified the empirical framework for ESG reporting and earnings-quality analysis used in Ricapito (2024). The amended model captures interaction terms between ESG disclosure and firm performance measures and firm-specific controls and is given by:

1) EQ = f(E_DSCO, S_DSCO, G_DSCO).
2) EQ =f(E_DSCO*PROF, S_DSCO*PROF, G_DSCO*PROF).
3) EQ =f(E_DSCO*ROA, S_DSCO*ROA, G_DSCO*ROA).
4) EQ =f(E_DSCO*ROE, S_DSCO*ROE, G_DSCO*ROE).
5) $EQ_{it} = \alpha_0 + \alpha_1 E\_DSCOit + \alpha_2 S\_DSCOit + \alpha_3 G\_DSCOit + FSIZit + MOit + \varepsilon_{it.}$

Where:
EQ = Earnings Quality measured by Modified Jones Earnings Quality, Jones Model Accrual Quality, and DeAngelo Earnings Quality
E_DSCO = Environmental Reporting
S_DSCO = Social Reporting
G_DSCO = Governance Reporting
PROF= Profitability
ROA = Return on Assets
ROE = Return on Equity
E_DSCO*PROF = Interaction between environmental reporting and profitability
S_DSCO*PROF = Interaction between social reporting and profitability
G_DSCO*PROF = Interaction between governance reporting and profitability
E_DSCO*ROA = Interaction between environmental reporting and return on assets
S_DSCO*ROA = Interaction between social reporting and return on assets
G_DSCO*ROA = Interaction between governance reporting and return on assets
E_DSCO*ROE = Interaction between environmental reporting and return on equity
S_DSCO*ROE = Interaction between social reporting and return on equity
G_DSCO*ROE = Interaction between governance reporting and return on equity
FSIZ = Firm Size
MO = Managerial Ownership
α_0 = Constant for the model
α_1 α_3 = Coefficient of independent variables for the model
εit = Error term
"i" = Represents the individual entity or cross-sectional unit in the panel data.
"t": Represents time or the period in which the data is collected.

4. Result/Findings

4.1. Descriptive

Table 2 displays the study variables' descriptive statistics, including skewness-kurtosis normality tests and the mean, standard deviation, minimum, and maximum values.

Table 2: Descriptive Statistics and Skewness–Kurtosis Normality Tests

Variable	Mean	SD	Min	Max	Pr(Skew.)	Pr(Kurt.)	Joint normality p
JMAQ	−3.27	27.06	−374.44	4.70	0.000	0.000	0.000
MJEQ	0.66	0.60	0.00	7.10	0.000	0.000	0.000
DAEQ	0.23	0.52	0.00	4.76	0.000	0.000	0.000
G_DSCO	87.75	12.48	42.86	100.00	0.000	0.000	0.000
S_DSCO	57.37	18.25	20.00	100.00	0.028	0.000	0.000
E_DSCO	1.01	7.72	0.00	83.33	0.000	0.000	0.000
ROA	2.42	1.08	0.03	7.97	0.000	0.000	0.000
ROE	3.29	1.19	0.11	8.82	0.003	0.000	0.000
FSIZ	11.03	2.25	5.11	15.97	0.260	0.000	0.000
MO	2.20	2.08	0.00	11.73	0.000	0.856	0.000

Source: Authors' Computation (2025).

Table 2 also reveals a pronounced disparity between the variables of the study. Quality of earnings variables (JMAQ, MJEQ, and DAEQ) have different distributions, where JMAQ has the largest variance as influenced by extreme values, which is a common characteristic of accrual-based measures. MJEQ and DAEQ have smaller means, but they are not normally distributed. Governance disclosure is generally high, with little variance . Social disclosure is moderate and varied across firms, and environmental disclosure is virtually non-existent but significantly influenced by a small number of very aggressive firms. The (ROA and ROE) profitability is moderate and tightly distributed at the low end of the scale, while firm size is highly variable, and managerial ownership is generally low. The skewness, kurtosis, and joint normality tests provide strong evidence that variables are severely not normally distributed, and this suggests the application of robust estimation accounting for heteroskedasticity and panel effect.

4.2. Diagnostic test

Table 3: Correlation Matrix and Variance Inflation Factors

Variable	JMAQ	MJEQ	DAEQ	G_DSCO	S_DSCO	E_DSCO	ROA	ROE	FSIZ	MO	VIF
JMAQ	1.000										
MJEQ	−0.648	1.000									
DAEQ	−0.731	0.675	1.000								
G_DSCO	0.336	−0.243	−0.422	1.000							1.31
S_DSCO	0.159	−0.032	−0.213	0.421	1.000						1.32
E_DSCO	0.012	0.001	−0.034	−0.026	0.080	1.000					1.07
ROA	0.048	−0.026	−0.009	−0.026	0.075	0.089	1.000				2.70
ROE	−0.019	0.018	0.002	0.030	0.080	0.078	0.767	1.000			2.63
FSIZ	−0.100	0.150	−0.017	0.036	0.214	0.143	−0.119	0.072	1.000		1.28
MO	−0.146	0.107	0.219	−0.216	−0.047	0.144	0.054	−0.037	−0.260	1.000	1.18

Source: Authors' Computation (2025).

The correlation matrix and multicollinearity tests in Table 3 indicate significant associations among the variables used in this research. The three proxies for quality of earnings are strongly correlated, JMAQ is negatively correlated with MJEQ and DAEQ, and MJEQ and DAEQ are positively correlated, indicating that they all measure a common source of variation in accrual quality and are consistent with MJEQ and DAEQ capturing "different facets" of accrual quality. Increasing the level of governance disclosure is significantly positively correlated with JMAQ and significantly negatively related to MJEQ and DAEQ, which indicates that high governance reporting is associated with the least earnings manipulation. Social disclosure was significantly positively related to both governance disclosure and firm size, indicating that larger and more transparent organizations would disclose more socially. Weak correlations were observed between environmental disclosure and all other variables, which is in line with the low mean level of reporting. Profitability (ROA and ROE) is to an expected extent highly correlated, and firm size is positively related to social disclosure and negatively to managerial ownership. The variance inflation factor (VIF) results are from 1.07 to 2.70 with an average of 1.64, showing that there is no multicollinearity problem among variables, which indicates that the regression coefficients are stable and reliable.

Table 4: Regression Diagnostic Tests

Test	JMAQ	MJEQ	DAEQ
Ramsey RESET (F-stat, p)	55.66, 0.000	11.77, 0.000	33.16, 0.000
Modified Wald $\chi^2(49)$, p	627,103.74, 0.000	49,526.09, 0.000	141,224.72, 0.000
Breusch–Pagan LM (chibar²(1), p)	0.00, 1.000	52.86, 0.000	34.44, 0.000
Hausman $\chi^2(5)$, p	104.19, 0.000	84.17, 0.000	76.77, 0.000
Wooldridge (F-stat, p)	0.04, 0.839	10.99, 0.002	6.06, 0.018

Source: Authors' Computation (2025).

Table 4 presents the regression diagnostic results for the study models. The Ramsey RESET test indicates potential model misspecification across all earnings quality measures, while the Modified Wald test confirms the presence of heteroskedasticity. The Breusch–Pagan LM test suggests pooled OLS for JMAQ and random effects for MJEQ and DAEQ; however, the Hausman test consistently favors the fixed effects specification, indicating correlation between firm-specific effects and the regressors. The Wooldridge test detects serial correlation in the MJEQ and DAEQ models but not in JMAQ. Based on these diagnostics, the study adopts fixed effects estimation with robust and Driscoll–Kraay standard errors to account for heteroskedasticity and autocorrelation.

4.3. Regression result

Table 5: Fixed-Effects Regression Results for Individual Effects

Variable	Coef.	SE	t	p-value	95% CI
JMAQ					
G_DSCO	−0.1800	0.1015	−1.77	0.076	−0.3789, 0.0188
S_DSCO	−0.0334	0.0172	−1.94	0.052	−0.0671, 0.0003
E_DSCO	0.0975	0.0480	2.03	0.042	0.0035, 0.1916
FSIZ	−15.2913	5.4475	−2.81	0.005	−25.9684, −4.6142
MO	−2.8865	2.2473	−1.28	0.199	−7.2912, 1.5183
_cons	189.311	80.026	2.37	0.018	32.460, 346.162
Model summary	$R^2 = 0.306$	$F(5,48) = 4.49$	$p = 0.002$	547 obs	49 firms
MJEQ					
G_DSCO	0.0107	0.0049	2.16	0.031	0.0010, 0.0203
S_DSCO	0.0010	0.0004	2.26	0.024	0.0001, 0.0019
E_DSCO	−0.0017	0.0008	−2.18	0.029	−0.0033, −0.0002
FSIZ	0.3029	0.1759	1.72	0.085	−0.0418, 0.6477
MO	0.0554	0.0263	2.11	0.035	0.0039, 0.1068
_cons	−3.7909	2.7820	−1.36	0.173	−9.2437, 1.6619
Model summary	$R^2 = 0.216$	$F(5,48) = 2.79$	$p = 0.027$	547 obs	49 firms
DAEQ					
G_DSCO	−0.0017	0.0009	−1.92	0.055	−0.0034, 0.0000
S_DSCO	−0.0006	0.0003	−1.87	0.061	−0.0013, 0.0000
E_DSCO	−0.0027	0.0016	−1.65	0.098	−0.0059, 0.0005
FSIZ	0.2203	0.0969	2.27	0.023	0.0304, 0.4103
MO	0.0739	0.0379	1.95	0.051	−0.0003, 0.1481
_cons	−2.1747	1.4995	−1.45	0.147	−5.1138, 0.7645
Model summary	$R^2 = 0.293$	$F(5,48) = 8.61$	$p < 0.001$	547 obs	49 firms

Source: Authors' Computation (2025).

Table 5 indicates that the impact of ESG reporting on earnings quality among African manufacturing firms is mixed and depends on the accrual-based proxy employed. The results reveal systematic differences across ESG dimensions, suggesting that disclosure credibility varies between substantive and symbolic forms.

Using the JMAQ measure, environmental disclosure exhibits a positive and statistically significant association with earnings quality (coef = 0.098, p = 0.042), indicating that greater transparency in environmental practices constrains accrual manipulation when disclosures are linked to operational activities. In contrast, governance disclosure (coef = −0.180, p = 0.076) and social disclosure (coef = −0.033, p = 0.052) show weakly negative effects, suggesting that these dimensions may reflect symbolic or compliance-oriented reporting that does not consistently enhance accrual credibility. Firm size is negatively and significantly related to JMAQ (coef = −15.291, p = 0.005), while managerial ownership is not statistically significant.

Under the MJEQ specification, governance disclosure (coef = 0.011, p = 0.031) and social disclosure (coef = 0.001, p = 0.024) are positively and significantly associated with earnings quality, implying that these ESG dimensions improve accrual reliability when discretionary accruals are considered. Environmental disclosure, however, shows a negative and significant association (coef = −0.002, p = 0.029), indicating that some environmental disclosures may not translate into substantive reporting improvements. Managerial ownership exerts a positive and significant effect (coef = 0.055, p = 0.035), while firm size is only marginally significant.

Results from the DAEQ model further underscore the mixed nature of ESG effects. Governance (coef = −0.002, p = 0.055), social (coef = −0.001, p = 0.061), and environmental disclosures (coef = −0.003, p = 0.098) all display weak negative associations with earnings quality. In contrast, firm size (coef = 0.220, p = 0.023) and managerial ownership (coef = 0.074, p = 0.051) are positively related to earnings quality, suggesting that larger firms and those with greater insider control tend to produce more credible earnings outcomes.

Overall, the findings demonstrate that ESG reporting does not exert a uniform effect on earnings quality across measurement frameworks. Environmental disclosure appears more effective under accrual magnitude–based measures, while governance and social disclosures contribute more meaningfully when discretionary accrual behavior is considered. These divergences support the view that ESG disclosures among African manufacturing firms alternate between substantive and symbolic forms, leading to inconsistent impacts on earnings quality.

Table 6: Robust Fixed-Effects Regression Results for ESG with ROA as Moderator

	JMAQ					MJEQ					DAEQ				
Variable	Coef.	SE	T	p	95% CI	Coef.	SE	t	P	95% CI	Coef.	SE	t	p	95% CI
G_DSCO	0.5253	0.3215	1.63	0.109	−0.1211, 1.1717	−0.0126	0.0076	−1.66	0.096	−0.0275, 0.0022	0.0198	0.0048	4.08	0.000	−0.0295, −0.0100
ROA	27.5324	8.5968	3.20	0.002	10.2474, 44.8173	−0.7459	0.2657	−2.81	0.005	−1.2668, −0.2251	0.6667	0.1263	5.28	0.000	−0.9205, −0.4128
G_DSCO×ROA	−0.2834	0.1022	−2.77	0.008	−0.4889, −0.0779	0.0094	0.0033	2.88	0.004	0.0030, 0.0158	0.0072	0.0011	6.47	0.000	0.0050, 0.0093
S_DSCO	0.0794	0.0426	1.87	0.062	−0.0040, 0.1629	0.0046	0.0019	2.39	0.017	0.0008, 0.0083	−0.0016	0.0009	−1.77	0.077	−0.0033, 0.0002
S_DSCO×ROA	0.0479	0.0188	2.54	0.011	0.0110, 0.0849	0.0013	0.0005	2.61	0.009	0.0003, 0.0023	0.0004	0.0001	6.47	0.000	0.0003, 0.0006
E_DSCO	0.0751	0.0333	2.26	0.024	0.0099, 0.1403	0.0188	0.0075	2.51	0.012	0.0041, 0.0335	0.0062	0.0037	1.67	0.094	−0.0010, 0.0134
E_DSCO×ROA	0.0018	0.0010	1.71	0.088	−0.0003, 0.0038	0.0062	0.0024	2.58	0.010	0.0015, 0.0109	0.0027	0.0012	2.29	0.022	0.0004, 0.0050
FSIZ	−13.9999	4.4085	−3.18	0.003	−22.8639, −5.1361	0.2696	0.1484	1.82	0.076	−0.0288, 0.5681	0.1839	0.0753	2.44	0.018	0.0325, 0.3353
MO	−2.7756	2.2810	−1.22	0.230	−7.3619, 1.8107	0.0522	0.0254	2.06	0.045	0.0012, 0.1031	0.0717	0.0365	1.97	0.055	−0.0016, 0.1451
_cons	106.6535	64.6583	1.65	0.106	−23.3507, 236.6576	−1.5834	2.0652	−0.77	0.447	−5.7359, 2.5690	−0.0921	0.9857	−0.09	0.926	−2.0740, 1.8898
Model summary: Within $R^2 = 0.324$; $F(9,48) = 3.75$, $p = 0.001$; 547 obs; 49 firms.						Within $R^2 = 0.252$; $F(9,48) = 26.52$, $p < 0.001$; 547 obs; 49 firms					Within $R^2 = 0.325$; $F(9,48) = 12.04$, $p < 0.001$; 547 obs; 49 firms.				

Source: Authors' Computation (2025).

Table 6 reports the moderating effect of profitability, proxied by return on assets (ROA), on the relationship between ESG disclosure and earnings quality across the three models. Overall, the inclusion of ROA improves model performance and clarifies how financial capacity conditions the credibility of ESG reporting.

In the JMAQ model, profitability has a strong positive direct effect on earnings quality (coef = 27.53, t = 3.20, p = 0.002), indicating that more profitable firms are less prone to accrual manipulation. ROA positively moderates the relationship between social disclosure and earnings quality (coef = 0.048, t = 2.54, p = 0.011), and marginally strengthens the effect of environmental disclosure (coef = 0.0018, t = 1.71, p = 0.088). In contrast, the interaction between governance disclosure and ROA is negative and significant (coef = −0.283, t = −2.77, p = 0.008), suggesting that profitability dampens the governance–earnings quality linkage when governance practices are not fully operationalized. Firm size remains negatively associated with earnings quality (coef = −13.99, p = 0.003), while managerial ownership is insignificant.

Results from the MJEQ model further illustrate the conditioning role of profitability. Although ROA exhibits a negative main effect (coef = −0.746, t = −2.81, p = 0.005), its interaction terms with governance (coef = 0.009, p = 0.004), social (coef = 0.0013, p = 0.009), and environmental disclosures (coef = 0.0062, p = 0.010) are all positive and statistically significant. This indicates that profitability enhances the effectiveness of ESG disclosures in improving discretionary accrual quality, even when the direct effect of profitability is weak or adverse.

The moderating influence of ROA is strongest in the DAEQ model. Profitability shows a positive and highly significant main effect (coef = 0.667, t = 5.28, p < 0.001), alongside robust interaction effects with governance (coef = 0.0072, t = 6.47, p < 0.001), social (coef = 0.0004, t = 6.47, p < 0.001), and environmental disclosures (coef = 0.0027, t = 2.29, p = 0.022). Model fit is also highest in this specification (within $R^2 = 0.325$), with firm size exerting a positive and significant influence (coef = 0.184, p = 0.018).

These findings confirm that ROA is a substantial moderator of the ESG–earnings quality relationship. ESG disclosures tend to have weak or inconsistent effects among less profitable firms but significantly improve accrual quality among profitable firms. This pattern supports the argument that financial capacity enables ESG activities to be substantive rather than symbolic, thereby strengthening their credibility in financial reporting.

Table 7: Robust Fixed-Effects Regression Results for ESG with ROE as Moderator

	JMAQ					MJEQ					DAEQ				
Variable	Coef.	SE	T	P	95% CI	Coef.	SE	t	P	95% CI	Coef.	SE	t	p	95% CI
G_DSCO	−0.0690	0.6214	−0.11	0.912	−1.3184, 1.1803	0.0082	0.0159	0.51	0.609	−0.0238, 0.0402	−0.0155	0.0074	−2.09	0.042	−0.0304, −0.0006
ROE	2.6851	11.7882	0.23	0.821	−21.0167, 26.3870	0.0619	0.2444	0.25	0.801	−0.4296, 0.5533	−0.2948	0.1664	−1.77	0.083	−0.6294, 0.0397
G_DSCO×ROE	−0.0337	0.1184	−0.28	0.777	−0.2719, 0.2044	0.0010	0.0026	0.38	0.703	−0.0042, 0.0062	0.0041	0.0020	2.05	0.046	0.0001, 0.0081
S_DSCO	−0.0204	0.2162	−0.09	0.925	−0.4552, 0.4144	0.0076	0.0071	1.07	0.289	−0.0066, 0.0218	0.0031	0.0056	0.55	0.588	−0.0083, 0.0144
S_DSCO×ROE	−0.0050	0.0421	−0.12	0.905	−0.0897, 0.0796	−0.0019	0.0016	−1.22	0.230	−0.0051, 0.0013	−0.0011	0.0013	−0.83	0.411	−0.0037, 0.0015
E_DSCO	−0.2988	0.6249	−0.48	0.635	−1.5552, 0.9576	0.0083	0.0110	0.75	0.455	−0.0139, 0.0305	0.0169	0.0160	1.05	0.297	−0.0153, 0.0490
E_DSCO×ROE	0.0973	0.1626	0.60	0.552	−0.2296, 0.4243	−0.0024	0.0030	−0.78	0.437	−0.0084, 0.0037	−0.0048	0.0040	−1.20	0.236	−0.0127, 0.0032
FSIZ	−15.4506	5.0340	−3.07	0.004	−25.5721, −5.3292	0.3094	0.1692	1.83	0.074	−0.0307, 0.6496	0.2313	0.0962	2.40	0.020	0.0379, 0.4247
MO	−2.8883	2.2431	−1.29	0.204	−7.3984, 1.6218	0.0539	0.0264	2.04	0.047	0.0008, 0.1071	0.0737	0.0362	2.04	0.047	0.0010, 0.1464
_cons	182.4723	109.218	1.67	0.101	−37.1253, 402.0699	−4.1443	3.3455	−1.24	0.221	−10.8708, 2.5822	−1.3028	1.5038	−0.87	0.391	−4.3263, 1.7207
Model summary: Within $R^2 = 0.324$; $F(9,48) = 3.75$, p = 0.001; 547 obs; 49 firms.						Within $R^2 = 0.252$; $F(9,48) = 26.52$, p < 0.001; 547 obs; 49 firms					Within $R^2 = 0.325$; $F(9,48) = 12.04$, p < 0.001; 547 obs; 49 firms.				

Source: Authors' Computation (2025).

Table 7 presents the robust fixed-effects regression results examining the moderating role of profitability proxied by return on equity (ROE) in the relationship between ESG disclosure and earnings quality across the three accrual-based measures. In contrast to ROA, the moderating influence of ROE is weaker and less stable, indicating that equity-based profitability provides a less consistent signal of ESG credibility in African manufacturing firms.

In the JMAQ model, neither the main effects of governance, social, nor environmental disclosures nor their interaction terms with ROE are statistically significant. Firm size is negatively and significantly associated with accrual quality (coef = −15.45, t = −3.07, p = 0.004), while managerial ownership remains insignificant. The model explains 32.4% of within-firm variation (Within $R^2 = 0.324$), suggesting that ROE does not materially condition the ESG–JMAQ relationship.

A similar pattern emerges under the MJEQ specification. The main effect of ROE is statistically insignificant (coef = 0.062, t = 0.25, p = 0.801), and ESG disclosure variables remain largely unrelated to earnings quality. However, firm size (coef = 0.309, t = 1.83, p = 0.074) and managerial ownership (coef = 0.054, t = 2.04, p = 0.047) exhibit positive associations with earnings quality, indicating that structural and ownership characteristics play a more prominent role than equity-based profitability in this model. The explanatory power of the model is moderate (Within $R^2 = 0.252$).

The DAEQ results provide limited evidence of moderation by ROE. Governance disclosure shows a weak negative main effect on earnings quality (coef = −0.016, t = −2.09, p = 0.042), while ROE itself is marginally negative (coef = −0.295, t = −1.77, p = 0.083). Importantly, the interaction between governance disclosure and ROE is positive and statistically significant (coef = 0.0041, t = 2.05, p = 0.046), suggesting that higher equity returns strengthen the credibility of governance disclosures under this earnings quality measure. Firm size (coef = 0.231, p = 0.020) and managerial ownership (coef = 0.074, p = 0.047) are also positively related to earnings quality. The model explains 32.5% of within-firm variation (Within $R^2 = 0.325$).

Overall, the findings indicate that ROE is a weaker and less reliable moderator of the ESG–earnings quality relationship than ROA. While equity-based profitability marginally enhances the credibility of governance disclosures under specific conditions, it does not consistently strengthen the earnings quality effects of ESG reporting. This suggests that asset-based profitability provides a more robust measure of a firm's capacity to support substantive ESG practices, whereas ROE is more sensitive to capital structure and distributional effects that may not reflect underlying operational sustainability.

5. Discussions

Environmental disclosure exhibits a differentiated relationship with earnings quality across alternative accrual-based measures, underscoring the conditional nature of its effectiveness. Under the JMAQ specification, environmental disclosure improves accrual credibility, consistent with stakeholder theory (Freeman, 1984) and prior evidence that substantive environmental practices constrain opportunistic earnings management (Li & Xu, 2024; Shan et al., 2024; Wei et al., 2023). This finding suggests that when environmental initiatives are operationally embedded, they serve as credible signals of long-term value creation, aligning with signaling theory's emphasis on costly and verifiable signals (Spence, 1973). However, the negative associations observed under the MJEQ and DAEQ models indicate that environmental disclosures may also function symbolically, particularly in weak enforcement environments where reporting is decoupled from actual environmental performance (Masmoudi, 2024; Mohmed et al., 2019). These contrasting outcomes imply that environmental reporting enhances earnings quality only when supported by binding mechanisms and genuine implementation, rather than mere narrative disclosure.

A similar pattern emerges for social disclosure, where its impact on earnings quality is strongly model-dependent. The positive association observed under the MJEQ specification reflects the role of substantive social initiatives, such as workforce engagement, equity practices, and community investment, in fostering transparent reporting cultures consistent with stakeholder theory (Abu-Hamour et al., 2024; Essien & Akpan, 2024). From a signaling perspective, credible social actions reduce information asymmetry and strengthen stakeholder trust, thereby improving accrual discipline. Conversely, the adverse effects identified under the JMAQ and DAEQ models suggest that social disclosure may be selectively applied or weakly enforced, limiting its capacity to deter earnings manipulation (Githaiga, 2023; Alharasis et al., 2024). These findings reinforce the distinction between substantive social responsibility, which enhances reporting credibility, and symbolic disclosure, which offers limited protection against opportunistic behavior.

Governance disclosure displays the greatest variability across models, reflecting its dual role as both a monitoring mechanism and a potential symbolic signal. The positive association under the MJEQ model supports agency theory (Jensen & Meckling, 1976), indicating that effective board monitoring, audit committee oversight, and financial expertise strengthen accrual discipline (Thuan et al., 2025; Abu-Hamour et al., 2024). In contrast, the negative relationships observed under the JMAQ and DAEQ specifications suggest that governance disclosure alone is insufficient when not accompanied by effective enforcement and internal accountability structures. In such cases, governance reporting may serve as a symbolic compliance exercise rather than a substantive constraint on managerial discretion, consistent with stakeholder theory's emphasis on genuine participation and accountability (Freeman, 1984). This highlights that governance mechanisms improve earnings credibility only when embedded within organizational culture and supported by real decision rights.

Profitability further conditions these relationships by shaping the credibility of ESG disclosures. Return on assets (ROA) emerges as a consistent and robust moderator across models, indicating that financially strong firms possess both the capacity and incentives to translate ESG commitments into substantive practices that improve earnings quality. This finding aligns with signaling theory, as profitability enhances the costliness and credibility of ESG signals, and with stakeholder theory, which emphasizes alignment between firm performance and stakeholder expectations (Spence, 1973; Freeman, 1984). In contrast, return on equity (ROE) exhibits weaker and less stable moderating effects, with significance emerging only for governance disclosure under the DAEQ model. This suggests that equity-based profitability is less effective in capturing a firm's operational capacity to sustain ESG activities, as it is more sensitive to capital structure and distributional factors than to underlying asset productivity (Valdiansyah & Murwaningsari, 2022; Mohmed et al., 2019).

The results indicate that the effect of ESG reporting on earnings quality is conditional rather than automatic. ESG disclosures strengthen earnings quality when they reflect substantive practices supported by adequate financial capacity, but their influence weakens when disclosure is symbolic and detached from operations. Profitability, particularly return on assets, determines whether ESG reporting functions as a credible governance mechanism or merely as a reputational signal. In African manufacturing firms, ESG disclosure enhances reporting credibility only when financial strength and governance structures allow disclosure to translate into practice.

6. Conclusion and Recommendations

This study examines the effect of environmental, social, and governance (ESG) disclosure on earnings quality in African manufacturing firms, with profitability proxied by return on assets (ROA) and return on equity (ROE) as moderating variables. The findings show that ESG reporting does not exert a uniform influence on earnings quality, as outcomes vary across disclosure dimensions and accrual-based earnings quality measures. Environmental disclosure improves accrual credibility under the JMAQ model but exhibits negative associations under the MJEQ and DAEQ models, indicating a clear distinction between substantive and symbolic disclosure practices. Social disclosure enhances earnings quality only under MJEQ, suggesting that genuine social initiatives contribute to reporting credibility, while symbolic or weakly enforced programs do not. Governance disclosure similarly produces mixed results, reinforcing the view that disclosure alone is insufficient without effective board oversight, independence, and enforcement.

Profitability plays a central conditioning role in these relationships. Return on assets consistently strengthens the ESG–earnings quality link, demonstrating that financially strong firms are better positioned to translate ESG commitments into credible reporting outcomes. In contrast, return on equity exhibits weaker and less consistent moderating effects, indicating that asset-based profitability is a more reliable indicator of a firm's capacity to support substantive ESG practices. These results contribute to the literature by showing that the impact of ESG disclosure on earnings quality is contingent on both disclosure authenticity and financial capacity, particularly within institutional environments characterized by weak enforcement.

The findings carry important implications for corporate practice and policy in Africa. Boards of manufacturing firms should embed environmental and social considerations into operational decision-making rather than treating ESG disclosure as a compliance exercise, supported by measurable performance targets and internal controls. Governance reforms should focus on strengthening board independence, audit committee effectiveness, and ethical oversight to ensure that governance disclosures reflect real monitoring rather than symbolic signaling. From an investment perspective, stakeholders should place greater weight on asset-based profitability when assessing the credibility of ESG reporting, as ROA better captures firms' ability to deliver substantive sustainability outcomes. For regulators and stock exchanges, the results underscore the need for stronger ESG reporting standards, clearer enforcement mechanisms, and assurance frameworks that reduce symbolic disclosure and enhance the credibility of sustainability reporting across African capital markets.

6.1. Policy implications

The findings of this study have important implications for corporate managers, regulators, investors, and market institutions across African capital markets. At the firm level, ESG disclosure enhances earnings credibility only when it is integrated into governance structures and operational decision-making rather than treated as a symbolic compliance exercise; management should therefore embed environmental and social objectives into production processes, workforce policies, and internal control systems, supported by measurable performance targets. At the regulatory level, the results underscore the need for continent-wide ESG reporting standards to improve consistency, comparability, and accountability, with African regulators and regional bodies working toward harmonised frameworks aligned with global best practices and regional sustainability initiatives such as African Union–led green industrialisation strategies. Stock exchanges can reinforce these efforts by strengthening listing guidelines, introducing minimum ESG disclosure requirements, and mandating independent assurance of sustainability reports to curb symbolic reporting and enhance investor confidence. For investors and analysts, the findings suggest that ESG assessments should be evaluated alongside profitability indicators, particularly return on assets, which better captures a firm's capacity to support substantive ESG practices than equity-based measures. Overall, the results reinforce the relevance of stakeholder, signaling, and legitimacy perspectives by showing that credible ESG disclosure, when supported by financial strength and effective governance, can function as a strategic mechanism for improving earnings quality and promoting sustainable value creation in African manufacturing firms.

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