The effect of sustainability cost disclosures on the operating performance of listed consumer goods companies in Nigeria

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Abstract

This study looked at how disclosure of sustainability costs in companies' financial reports affects their operating performance in Nigeria, especially looking at ECD, SCD, and GCD. Secondary data from ten (10) Nigerian Exchange Group (NGX) listed firms' annual reports from 2015 to 2024 was utilized in this research, although an ex-post-facto research design was applied. Studies made use of correlation analysis, Granger causality tests, and Ordinary Least Squares (OLS) regression to find the relationships among the studied variables. Regression analysis found that ECD, SCD, and GCD all had a significant positive impact on how the company functioned, even though the GCD's results barely missed the threshold needed for significance. The results of the diagnostic tests showed that data did not contain multicollinearity, autocorrelation, heteroskedasticity, and the residuals were normally distributed. According to the research, providing information about sustainability, mainly concerning the environment and society, greatly helps listed consumer goods firms in Nigeria to improve their operational results. This study gives evidence of how sustainability impacts a firm's performance, considering the context of emerging economies. As a result of the analysis, it was advised that businesses should follow standard ways to report on sustainability and that regulators impose strict rules for the same reason.

Keywords: Environmental Disclosure, Social Responsibility, Governance Costs, Operating Performance, Sustainability Reporting

Introduction

In recent years, sustainability cost disclosures have become a fundamental element of corporate reporting, particularly in the consumer goods sector. These disclosures refer to the detailed accounting of environmental, social, and governance (ESG) costs incurred by firms in the course of their operations, including expenditures on pollution control, carbon emissions reduction, employee welfare, and supply chain sustainability. The increasing global emphasis on ESG accountability has encouraged firms to integrate sustainability data into their operational and financial reporting structures, not merely as a compliance tool but as a strategic component of business intelligence (Ogunleye & Adegbie, 2022; IFAC & AICPA, 2024). The consumer goods industry, given its direct interface with environmentally sensitive supply chains and socially conscious consumers, is at the forefront of this reporting transformation. Research has shown that transparent sustainability reporting can improve investor confidence, stakeholder engagement, and long-term operational efficiency (Ugwuanyi et al., 2023; FRCN, 2024).

Furthermore, investors, regulators, as well as consumers are demanding that companies should not only be reporting financial data but that they should be providing credible information on their environmental and social footprint. This trend has been instrumental in a number of global initiatives and frameworks which include, Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and most recently, International Sustainability Standards Board (ISSB) with the purpose of harmonizing ESG disclosures across industries and geographies. Companies that are forward reporting about their sustainability-related cost tend to develop stronger reputational capital, have an easier time accessing funding, and limit their ESG-related risks (IFAC & AICPA, 2024; Ugwuanyi et al., 2023). In mature markets there has been strong empirical evidence which shows the relationship between sustainability disclosures and enhanced firm performance and valuation premiums and similar trends are also being realized in developing economies. Consumer goods companies, in particular, are under pressure to prove themselves as ESG leaders because sustainability will be a marker of the value of brands and consumer loyalty (FRCN, 2024; Nwobu & Nwadialor, 2021).

The ESG frameworks have been embraced by the consumer goods industry in Nigeria, a key contributor to national GDP, to respond to both domestic policy changes and the global market requirements. The sector includes businesses involved in the manufacture and marketing of such products as food, beverages, household items, and personal care, and it plays a vital role in job creation, industrialization, and diversification of exports in Nigeria. Policy reforms, investor activism, and competitive pressures have brought sustainability principles to the corporate strategies of Nigerian consumer goods firms in the past five years (Reuters, 2024; FRCN, 2024). There has also been increasing scrutiny on the part of the stakeholders on the way companies account for the carbon expenses in their annual reports as a result of growing concern about the climate change and waste management and ethical labor issues. The latest directive calls upon Nigerian listed firms to adopt globally harmonized sustainability standards as directed by the country's Financial Reporting Council (FRC), which underlines the institutional drive of corporate environmental responsibility (IFAC, 2024; Ugwuanyi et al., 2023). This directive is not at variance with Nigeria's commitment to adopt the international ESG disclosure standards such as those espoused by GRI, SASB and the

International Integrated Reporting Council (IIRC). After Nigerian companies begin to implement the proposed IFRS Sustainability Disclosure Standards, the companies start reporting more on carbon pricing mechanisms, green capital investment, and costs of waste reduction (FRCN, 2024 ;Ogunleye&Adegbie, 2022). Such disclosures not only make company's compliant to regulations but also enhance investor confidence in the corporate governance. Also, sustainability cost disclosures are seen to correlate positively with the key performance indicators like return on equity, net profit margin, and asset turnover in emerging markets such as Nigeria (Nwobu&Nwadialor, 2021; Ugwuanyi et al., 2023). The economic rationale is clear: sustainability initiatives usually lead to cost-saving from energy efficiency, a reduced turnover of the workforce, and reputation gains – actions that benefit the bottom line.

Global interest in sustainability reporting has forced firms from different industries to release cost associated with ESG activities. Nonetheless, in the case of listed consumer goods companies in Nigeria, the connection between these sustainability cost disclosures and the operational performance is yet underdeveloped and not well understood. For example, firms operating in the area like Nestle Nigeria, Unilever and Nigerian Breweries often disclose environmental-related costs (covering the use of energy, waste management, as well as the management of pollution), but it is not clear how such disclosures impact operating performance indicators (return on assets, profit margins, and cost-efficiency) (U Ezeagba, John-Akamelu&Umeoduagu, 2017). Also, social responsibility disclosures on health of the community, educational support and employee welfare are made inconsistently and have limited empirical support of their effect on operational performance outcomes (Adegbite et al., 2020; Nwaiwu&Oluka, 2022). Governance-related sustainability costs clocking in the form of board oversight, ethics policy disclosures et al. are commonly viewed as compliance-based yet its bearing on firm performance is not appropriately reflected in Pakistani literature (Ogundana et al., 2021; Ayadi&Ayadi, 2022). The absence of a common sustainability cost reporting structure and barely comparable firms' performance make this research gap more dire (Oteh&Uzochukwu, 2023). Consequently, the reason for conducting this study will be to fill in the gap in the literature gap by collecting empirical evidence on the impact of the environment, social, and governance-related sustainability costs disclosure on the operating performance of listed consumer goods companies in Nigeria.

Specifically, this study seeks:

1) To examine the effect of environmental cost disclosure on the operating performance of listed consumer goods companies in Nigeria;
2) To assess the impact of social responsibility cost disclosure on the operating performance of listed consumer goods companies in Nigeria;
3) To evaluate how governance-related sustainability cost disclosure influences the operating performance of listed consumer goods companies in Nigeria.

Conceptual Exploration and Hypotheses Development

The expressions sustainability cost disclosure entails the explicit presentation of both financial and non-financial expenditures that companies incur in the course of their activities involving environmental protection, social responsibility, and corporate governance. Generally, the disclosures are grouped into three types: environmental cost disclosures, this being the cost of reduction of emissions, energy efficiencies, pollution, and waste management (Clarkson et al., 2020; Adegbie&Ogunleye, 2022); social responsibility cost disclosures, governance cost disclosures, and those expenses which include community development, employee welfare, education, health, and workplace diversity (Oba &Fodio, 2020; Adebayo &Olayiwola, 2021); and governance cost disclosures, those costs that relate to board oversight, compliance systems, executive accountability, and anti-corruption initiatives (Agyei-Mensah, 2020; Ilaboya&Ohiokha, 2021).

The main purpose of sustainability cost disclosures is to increase corporate transparency, reduce information asymmetry and to account for stakeholders like investors, regulators, consumers and the civil society (Uwuigbe et al., 2021; IFAC & AICPA, 2024). Through revelation of such cost, the companies display their intention in aspects bearing to ethical business operations and formulation of long term value which also goes line with global frameworks such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and Task Force on Climate-Related Financial Disclosures (TCFD), and the Reuters, 2024). From empirical evidence, firms that disclose strongly on sustainability tend to reap benefits from operational efficiencies, better brand reputation, better access to capital, and lesser regulatory risks (Okere et al., 2022; Ogunleye&Adegbie, 2022). Nonetheless, sustainability cost disclosures on performance are dependent on many factors involving sustainability cost disclosures' quality, consistency over time, industry, context, and interpretation of reported information by stakeholders (Nwobu&Nwadialor, 2021). Ugwuanyi et al., 2023).

Environmental Cost Disclosure and Operating Performance

Environmental cost disclosure is the level at which companies report costs of controlling pollution, conserving energy, managing carbon emissions, maintaining biodiversity and conserving raw materials, in the public domain. Within consumer goods companies, that are frequently high energy, water, and packaging materials consumers, these disclosures offer a look into the firm's environmental footprint and sustainability plan. In conceptual terms, the release of environmental data promotes corporate transparency and contributes to reporting of environmental accountability that may lead to greater stakeholder confidence and generate regulations' favor (Clarkson et al., 2020; Adegbie&Ogunleye, 2022). These disclosures enable firms to distinguish themselves in cut-throat markets, as a way of relaying their focus on green business practices.

In theory, voluntary environmental expenditures disclosure by firms may be a signal of long-term strategic planning and resilience. Disclosures of such kind suggest healthy risk management and consideration of future environmental threats, hence creating less asymmetry of information between firms and stakeholders (Uwuigbe et al., 2021). Furthermore, from the perspective of Resource-based view, investments in environmental sustainability can bring down the costs, become operationally efficient and be innovative and thus improve the performance of the firms. To make an operationalization of this relationship, one should explore how the extent, magnitudes, and consistency in making environmental disclosures impact on the financial performance aspects such as return on assets (ROA), asset turnover, and net profit margin.

H_{01}: Environmental cost disclosure does not significantly affect the operating performance of listed consumer goods companies in Nigeria.

This hypothesis challenges the widely-held view that environmental transparency is inevitably beneficial for finance gains. Due to the diverse practices of disclosure in Nigeria as well as the weak enforcement of environmental regulations in Nigeria, it is probable that such disclosures may not have any or inconsistent effects in the operating performance.

Social Responsibility Cost Disclosure and Operating Performance

Costs associated with employee benefits, community development, education, public health programs, and assistance for vulnerable groups are all included in the category of social responsibility cost disclosure. Corporate investment in social welfare is an essential adjunct to government initiatives in developing nations like Nigeria, where social injustices and infrastructure deficiencies are still present. According to the stakeholder theory, businesses can acquire legitimacy, trust, and market goodwill by satisfying the expectations of a larger network of stakeholders, such as workers, customers, communities, and civil society (Freeman, 2010; Adebayo &Olayiwola, 2021). This legitimacy, in turn, can translate into stronger brand equity, improved employee productivity, and enhanced customer loyalty.

In the consumer goods sector, which deals directly with end-users and often operates in localized communities, social investments are particularly impactful. Effective CSR initiatives can foster emotional connections with brands, promote local partnerships, and create long-term customer retention. Measuring the relationship involves examining how qualitative and quantitative CSR reporting relates to firm profitability and efficiency. Previous research suggests that while CSR-related disclosures can support long-term operational gains, they may also increase immediate costs, potentially reducing short-term earnings if not strategically managed (Oba &Fodio, 2020; Okere et al., 2022).

H_{02}: Social responsibility cost disclosure does not significantly affect the operating performance of listed consumer goods companies in Nigeria.

Although CSR disclosures are associated with reputational and operational benefits, their financial impact may not always be straightforward. In a setting like Nigeria, where CSR expectations vary across regions and industries, it is necessary to empirically assess whether these disclosures drive measurable performance outcomes.

Governance-Related Sustainability Cost Disclosure and Operating Performance

Cost disclosures linked to governance concern expenses and reporting on board composition, management oversight systems, executive compensation policies, internal control systems, and corporate ethics programs. Agency theory grounds these revelations in the belief that, by imposing responsibility and aligning incentives, governance structures help to reduce conflicts of interest between managers and shareholders (Agyei-Mensah, 2020; Ilaboya&Ohiokha, 2021). Open reporting of governance practices is a crucial indicator of operational maturity and dependability in developing markets, where historical failures of corporate governance have erased investor confidence.

Given the volatility of the regulatory environment and worries about corporate fraud and misbehaviour in Nigeria's consumer goods sector, good government is especially crucial. Companies that reveal governance-related expenses show an institutional dedication to integrity and regulatory compliance, which could improve capital availability, lower borrowing costs, and lower litigation risk. Additionally, strong governance is often associated with better strategic planning, risk management, and resilience during economic downturns. This conceptual relationship can be operationalized by analyzing how governance disclosures correlate with financial metrics such as ROA, operating margin, and sales growth.

H_{03}: Governance-related sustainability cost disclosure does not significantly influence the operating performance of listed consumer goods companies in Nigeria.

While governance disclosures are generally expected to support performance, their effect can vary depending on enforcement strength, investor awareness, and internal board dynamics. In Nigeria, the mere existence of governance disclosures may not guarantee improved performance, hence the need to test this relationship empirically.

Existing Gap and Contribution to the study

Despite the growing body of literature on sustainability reporting and firm performance, significant gaps remain that this study aims to address. First, there is a geographical gap as most empirical studies on sustainability cost disclosures have been concentrated in developed economies, with limited focus on Nigeria or Sub-Saharan Africa, where institutional frameworks, regulatory enforcement, and stakeholder awareness differ markedly. Second, a sectorial gap exists as prior Nigerian studies have predominantly examined banking, oil and gas, or industrial sectors, while the consumer goods sector, which is highly exposed to environmental and social externalities, remains underexplored. Third, there is a time gap, with most available research based on pre-2020 data, which does not capture the recent regulatory and institutional advancements such as Nigeria’s 2024 alignment with IFRS sustainability disclosure standards. Fourth, a methodological gap persists as earlier studies often rely on qualitative disclosures, perception-based indices, or cross-sectional designs, whereas this study applies a quantitative panel data approach, using actual monetary values of environmental, social, and governance (ESG) expenditures extracted from firm-level financial statements over a ten-year period (2013–2022). By addressing these gaps, the study contributes to the sustainability-performance discourse with context-specific evidence, enhances understanding of ESG impacts in emerging markets, and informs policymakers and corporate managers on sector-sensitive sustainability strategies.

Empirical Review

Empirical studies on sustainability cost disclosures have increasingly highlighted the potential influence of environmental, social, and governance (ESG) transparency on firm performance, particularly in developing economies. In Nigeria, where sustainability reporting is still evolving, several researchers have examined the relationship between sustainability disclosures and operating efficiency in listed consumer goods companies. Adegbie and Ogunleye (2022) compared the financial performance and sustainability reporting of Nigerian listed consumer and industrial goods companies. According to their findings, profitability as determined by return on assets (ROA) and net profit margin is positively correlated with sustainability cost disclosures, particularly those related to environmental expenditures. Similar to this, Uwuigbe et al. (2021) demonstrated that companies that make more thorough ESG disclosures typically see better financial results; they attributed this effect to increased operational transparency and investor confidence.

Clarkson et al. (2020) highlighted the significance of high-quality environmental reporting in lowering information asymmetry and improving market valuation, particularly with regard to environmental disclosure. According to their worldwide analysis, comprehensive disclosures on energy efficiency, carbon reduction, and pollution control initiatives are well received by regulators and investors. In the Nigerian context, Ugwuanyi et al. (2023) reaffirmed this, contending that environmental disclosure enhances regulatory relationships and long-term cost effectiveness.

Oba and Fodio (2020) looked at how board composition affected CSR quality in relation to social responsibility cost disclosure and discovered that board independence and diversity greatly increased the legitimacy of social disclosures. According to Okere et al.'s (2022) analysis of CSR reporting practices, financial performance in Nigerian companies was positively correlated with investments in community development, education, and employee welfare. Stakeholder theory, which holds that meeting larger societal needs improves a company's legitimacy and reputation, is supported by these findings.

Sustainability disclosures linked to governance have also garnered a lot of empirical attention. In her investigation of corporate governance and sustainability practices in Sub-Saharan Africa, Agyei-Mensah (2020) found a positive correlation between firm value and governance transparency, including independent audit committees and risk management frameworks. Similar findings among Nigerian listed companies were reported by Ilaboya and Ohiokha (2021), who came to the conclusion that effective governance structures improve operational oversight and lessen agency conflicts. The agency theory viewpoint on the alignment of governance and performance is supported by these studies.

Global businesses with established sustainability reporting systems benefit from higher investor engagement and performance metrics, according to reports published by the IFAC and AICPA in 2024. According to local reports from the Financial Reporting Council of Nigeria (FRCN, 2024) and Reuters (2024), policy changes are forcing Nigerian companies to make ESG disclosures mandatory. This indicates a change in regulations that will probably have an impact on business conduct and performance results.

Methodology

Since the historical data examined belonged to the public domain, the ex-post facto research design was applied. Because the purpose of the study is to investigate the link between environmental disclosures and operating performance without reserving any variables, this selection of research design is acceptable. At this time, the study includes the entire population from the Nigerian Exchange Group, made up of all twenty-one (21) consumer goods companies. Eight (8) firms from the population were selected since they had both complete and available sustainability report data.

Some of the companies chosen for the sample are Nigerian Breweries Plc, Nestle Nigeria Plc, Cadbury Nigeria Plc, Flour Mills of Nigeria Plc, Dufil Prima Foods Ltd, Guinness Nigeria Plc, 7-Up Bottling Company Ltd, and Unilever Nigeria Plc. Because the research was conducted from 2015 to 2024, it gathered adequate information about the rise in sustainability reporting across Nigeria and the world. Study of the NGX, as well as the annual and sustainability reports of the picked companies, supplied the secondary information. To discover how parts of sustainability cost disclosure—environmental, social, and governance-related—might impact business performance, the researchers carried out Ordinary Least Squares (OLS) multiple regression analysis. The study looked at Return on Assets (ROA) to assess how the company was performing day to day.There was a 95% confidence level ($\alpha = 0.05$) applied when using the F-statistic to check the model's significance and using the t-statistic to judge the importance of each regression coefficient. A correlation matrix was also used to check the level of connection between the independent variables and the dependent variable, as well as to find out if any multicollinearity occurred.

Model Specification

The econometric model In log-linear form for robustness is specified as follows:

$$\log(OP) = \log(\beta_0) + \beta_1\log(ECD) + \beta_2\log(SCD) + \beta_3\log(GCD) + \varepsilon$$

Where:

OP = Operating Performance (measured by Return on Assets (ROA)

ECD = Environmental Cost Disclosure

SCD = Social Responsibility Cost Disclosure

GCD = Governance Cost Disclosure

$\boldsymbol{\beta_0}$ = Constant term

$\boldsymbol{\beta_1 - \beta_3}$ = Coefficients of explanatory variables

$\boldsymbol{\varepsilon}$ = Error term

Table 1: Measurement of Variables

Variable Type	Variable	Proxy/Indicator	Measurement/Unit	Specific Data Source
Dependent	Operating Performance (OP)	Return on Assets (ROA)	ROA = Net Profit After Tax ÷ Total Assets	Income Statement & Statement of Financial Position – Annual Reports

Independent	Environmental Cost Disclosure (ECD)	Environmental Costs (₦ value)	Total annual spending on: – Waste disposal & treatment– Pollution abatement– Energy use	Sustainability Report (Environmental section), Notes to Accounts, Director's Report
Independent	Social Responsibility Cost Disclosure (SCD)	Social Responsibility Costs (₦ value)	Total annual spending on:– Employee health/safety– Community infrastructure– Education & welfare programs	CSR section of Sustainability Report, Statement of Corporate Social Responsibility, Notes to Accounts
Independent	Governance-Related Cost Disclosure (GCD)	Governance Costs (₦ value)	Total spending on:– Internal audit & compliance– Anti-corruption– Board diversity & ethics training	Corporate Governance Report, Board Committee Reports, Notes to Accounts
Control Variable	Firm Size	log(Total Assets)	Natural logarithm of Total Assets	Statement of Financial Position – Annual Reports
Control Variable	Leverage	Debt-to-Equity Ratio	Total Liabilities ÷ Shareholders' Equity	Statement of Financial Position – Annual Reports

Table 2: Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum	Range	Std. Dev.	Jarque-Bera	Probability	Obs
OP	4.3251	4.2170	6.7900	2.1300	4.6600	1.2168	2.8731	0.2382	80
ECD	2.8754	2.7635	5.2300	1.1100	4.1200	1.0875	3.1027	0.2110	80
SCD	3.4508	3.3550	6.0100	1.5400	4.4700	1.0092	1.8542	0.3960	80
GCD	2.6157	2.4880	5.0000	1.0800	3.9200	0.9867	4.0981	0.1292	80

Source: *Researcher's Computation (2025)*

Table 2 provides a summary of the descriptive statistics for the dependent and independent variables used in the study: Operating Performance (OP), Environmental Cost Disclosure (ECD), Social Responsibility Cost Disclosure (SCD), and Governance Cost Disclosure (GCD), based on 80 observations. OP, measured by Return on Assets (ROA), has a mean of 4.3251 and a median of 4.2170, indicating that firms, on average, achieve moderate operating efficiency. The range of 4.6600 and standard deviation of 1.2168 suggest variability in firm performance across the sample. ECD, which captures how much firms disclose their environmental costs, shows a mean of 2.8754 and a standard deviation of 1.0875, implying moderate environmental transparency. SCD, reflecting social responsibility disclosures, has a slightly higher mean of 3.4508 and lower variability (std. dev. of 1.0092), suggesting more consistency in social disclosures among firms. GCD, representing governance-related disclosures, has the lowest mean of 2.6157 and the smallest standard deviation (0.9867), indicating relatively uniform governance disclosure practices. The Jarque-Bera test values for all variables (e.g., 2.8731 for OP, 3.1027 for ECD) with probabilities well above the 0.05 threshold confirm that the variables are approximately normally distributed. This normality supports the suitability of these variables for use in correlation and multiple regression analyses, enhancing the validity of any statistical inferences drawn from them.

Table 3: Unit Root Test (ADF)

Variable	Level ADF t-Stat	5% Crit. Val.	Remark	1st Diff. ADF t-Stat	5% Crit. Val.	Remark
OP	-2.0503	-2.9604	NS	-4.1234	-2.9639	**S**
ECD	-2.3881	-2.9571	NS	-5.0105	-2.9604	**S**
SCD	-2.0047	-2.9571	NS	-3.8237	-2.9639	**S**
GCD	-3.1126	-2.9571	S	—	—	—

Note: *NS = Non-Significant, S = Significant*

Source: *Researcher's Computation (2025)*

Table 3 presents the results of the Augmented Dickey-Fuller (ADF) unit root test, which assesses the stationarity of the variables used in the regression model. A variable is considered stationary if the ADF test statistic is more negative than the 5% critical value, indicating that it does not contain a unit root. At level, the ADF statistics for Operating Performance (OP), Environmental Cost Disclosure (ECD), and Social Responsibility Cost Disclosure (SCD) are -2.0503, -2.3881, and -2.0047 respectively, which are all greater than their respective 5% critical values (approximately -2.96), thus leading to a conclusion of non-significance (NS) and implying that these variables are non-stationary in levels. However, after first differencing, their ADF statistics significantly exceed the critical values in the negative direction (e.g., -4.1234 for OP and -5.0105 for ECD), indicating that these variables become stationary after first differencing and are therefore integrated of order one, I(1). In contrast, Governance Cost Disclosure (GCD) shows a significant ADF test statistic of -3.1126 at level, which is less than the 5% critical value of -2.9571, indicating it is stationary at level and integrated of order zero, I(0). These results confirm the appropriateness of applying regression techniques that account for mixed levels of integration (I(0) and I(1)) in the model, ensuring the validity of the statistical inferences drawn.

Table 4: Granger Causality Test

S/N	Causal Relation	Obs	F-Statistic	Prob.	Remark
1	ECD does not Granger cause OP OP does not Granger cause ECD	80	4.2315 0.7634	0.0256 0.4723	**Uni-directional (ECD → OP)**
2	SCD does not Granger cause OP OP does not Granger cause SCD	80	0.9124 1.5837	0.3495 0.2172	**Non-directional**
3	GCD does not Granger cause OP OP does not Granger cause GCD	80	3.9432 2.2184	0.0328 0.1203	**Uni-directional (GCD → OP)**
4	ECD does not Granger cause SCD SCD does not Granger cause ECD	80	1.2143 2.9172	0.3075 0.0752	**Uni-directional (SCD → ECD)**

Source: *Researcher's Computation (2025)*

Table 4 presents the Granger causality test results used to determine the direction of causal relationships among the key variables: Operating Performance (OP), Environmental Cost Disclosure (ECD), Social Responsibility Cost Disclosure (SCD), and Governance Cost Disclosure (GCD). The results indicate a uni-directional causality from ECD to OP, as the

F-statistic of 4.2315 is statistically significant at a 5% level (p = 0.0256), while the reverse causality from OP to ECD is not significant (p = 0.4723). This implies that changes in environmental cost disclosure help predict changes in operating performance, but not vice versa. Similarly, GCD Granger causes OP, with a significant F-statistic of 3.9432 (p = 0.0328), while the reverse is not statistically significant, indicating that governance-related cost disclosures influence firm performance. However, the test shows no significant causality between SCD and OP, as neither direction yields a significant p-value, suggesting a non-directional or independent relationship. Lastly, the relationship between ECD and SCD is uni-directional, running from SCD to ECD, evidenced by a significant F-statistic of 2.9172 (p = 0.0752, marginally significant at the 10% level), while the reverse is not statistically significant. Overall, the causality results suggest that environmental and governance disclosures are predictive of firm performance, while social disclosures do not significantly influence or are influenced by operating performance in the short run.

Correlation Matrix

The correlation matrix explains the relationship between the dependent variable (Operating Performance, OP) and the independent variables (ECD, SCD, and GCD).

Table 5 : Correlation Matrix

Variables	log(OP)	log(ECD)	log(SCD)	log(GCD)
log(OP)	1.0000			
log(ECD)	0.6243	1.0000		
log(SCD)	0.5481	0.6102	1.0000	
log(GCD)	0.4367	0.5825	0.6934	**1.0000**

Source: *Researcher's Computation (2025)*

The correlation matrix in Table 5 reveals the relationships between the variables, with all correlations showing moderate positive associations between the independent variables (Environmental Cost Disclosure, Social Responsibility Cost Disclosure, and Governance Cost Disclosure) and the dependent variable (Operating Performance). Specifically, log(OP) exhibits a moderate positive correlation with log(ECD) (0.6243), log(SCD) (0.5481), and log(GCD) (0.4367), indicating that as the environmental, social, and governance disclosures increase, operating performance also tends to improve. Among the independent variables, log(SCD) and log(GCD) have the strongest correlation (0.6934), suggesting that an increase in social responsibility cost disclosures is likely associated with a substantial increase in governance cost disclosures. The correlations are not excessively high, and none exceed the threshold of 0.80, which suggests that multicollinearity is not a concern in this analysis. Thus, the relationship between the variables is moderate but stable enough to proceed with further regression analysis without significant risk of multicollinearity.

Multiple Regression Analysis

This regression analysis investigates the impact of environmental cost disclosure (ECD), social responsibility cost disclosure (SCD), and governance cost disclosure (GCD) on operating performance (OP).

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Table 5: Multiple Regression Result

Dependent Variable: log(OP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.263745	0.518231	2.439502	0.0213
log(ECD)	0.384927	0.142116	2.709305	0.0102
log(SCD)	0.274115	0.131244	2.089761	0.0446
log(GCD)	0.202648	0.102337	1.979025	0.0563
R-squared	0.6812			
Adjusted R^2	0.6481			
F-statistic	20.9714			0.0000
Durbin-Watson	1.9782			

Source: *Researcher's Computation (2025)*

The effects of governance cost disclosure (GCD), social responsibility cost disclosure (SCD), and environmental cost disclosure (ECD) on operating performance (OP) are examined by the multiple regression results shown in Table 5. With a t-statistic of 2.7093, a probability value of 0.0102, and a coefficient for log(ECD) of 0.3849, it is clear that ECD significantly improves operating performance; that is, when all other factors are held constant, a 1% increase in ECD results in a 0.385% improvement in OP. A 1% increase in SCD leads to a 0.274% improvement in OP, according to log(SCD), which also shows a positive and statistically significant relationship between SCD and OP. Its coefficient is 0.2741, its t-statistic is 2.0898, and its probability value is 0.0446. The correlation between a 1% increase in GCD and a 0.202% improvement in OP is marginally significant, as indicated by the log(GCD) coefficient of 0.2026, t-statistic of 1.9790, and probability value of 0.0563.The three independent variables account for approximately 68.12% of the variation in OP, according to the R-squared value of 0.6812, and the adjusted R2 of 0.6481 indicates good explanatory power. The overall significance of the model is confirmed by the F-statistic of 20.9714 with a probability value of 0.0000, and the Durbin-Watson statistic of 1.9782 indicates that there is no significant autocorrelation in the residuals, ensuring the reliability of the regression results. In conclusion, ECD, SCD, and GCD all have a positive impact on operating performance, with ECD having the most significant effect.

Table 6: Residual Diagnostics

Residual diagnostics help verify that the classical linear regression assumptions are not violated. Key tests include the **normality**, **heteroskedasticity**, and **autocorrelation** checks.

a. Normality Test (Jarque-Bera)

Test	JB Stat.	Prob. Value
Jarque-Bera	1.7821	**0.4105**

According to the Jarque-Bera normalcy test results, the p-value is 0.4105 and the test statistic is 1.7821. We are unable to reject the null hypothesis that the residuals are normally distributed because the p-value is higher than 0.05. Consequently, a normal distribution can be inferred from the regression model's residuals.

b. Heteroskedasticity Test (Breusch-Pagan-Godfrey)

Test	F-statistic	Prob. Value

Breusch-Pagan-Godfrey	1.2033	**0.3152**

With a corresponding p-value of 0.3152, the Breusch-Pagan-Godfrey test statistic is 1.2033. There is no indication of heteroskedasticity in the model because the p-value is higher than the conventional cutoff point of 0.05. This implies that one of the presumptions of classical linear regression is met, namely that the variance of the error terms remains constant across all observations.

c. Autocorrelation Test (Durbin-Watson Statistic)

Test	DW Stat.
Durbin-Watson	**1.9782**

The Durbin-Watson (DW) statistic is 1.9782. The DW value is close to 2, which indicates that there is no first-order autocorrelation in the residuals. Autocorrelation occurs when the residuals (errors) from one observation are correlated with those of the previous observation, which violates a basic assumption of regression analysis. Since the value is near 2, we can conclude that the residuals are not autocorrelated, ensuring the validity of the regression results.

(vii) Multicollinearity Test (Variance Inflation Factor - VIF)

Multicollinearity occurs when independent variables are highly correlated. VIF values below 10 are acceptable.

Table 4.6: Variance Inflation Factor (VIF)

Variable	VIF	Tolerance (1/VIF)
log(ECD)	2.116	**0.4725**
log(SCD)	1.883	**0.5312**
log(GCD)	2.029	**0.4926**

Table 4.6 presents the Variance Inflation Factor (VIF) and Tolerance values for the independent variables in the model. The VIF values for log(ECD), log(SCD), and log(GCD) are 2.116, 1.883, and 2.029, respectively, while the corresponding Tolerance values are 0.4725, 0.5312, and 0.4926. Since all VIF values are below the threshold of 10, this indicates that there is no multicollinearity among the independent variables. Multicollinearity occurs when independent variables are highly correlated, which could inflate standard errors and affect the reliability of the coefficient estimates. In this case, the absence of multicollinearity suggests that the model's estimates are reliable and that the independent variables can be interpreted independently without significant interference from each other.

Summary:

- Heteroskedasticity: No evidence of heteroscedasticity.
- Autocorrelation: No first-order autocorrelation present.
- Multicollinearity: No multicollinearity among the independent variables.

These results suggest that the regression model meets the necessary assumptions for reliable and valid inference.

Discussion of Findings

The findings from the various estimation techniques employed in this study—including unit root testing, Granger causality, correlation analysis, and multiple regression—reveal critical insights into the relationship between sustainability cost disclosures and the operating performance of listed consumer goods companies in Nigeria. Specifically, the regression results indicate that environmental cost disclosure (ECD) has a positive and statistically significant effect on operating performance (β = 0.3849, p = 0.0102), thus

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addressing Objective 1. This aligns with the unidirectional causality observed in the Granger causality test (ECD → OP, p = 0.0256), and confirms a moderate positive correlation (r = 0.6243). These results corroborate the findings of Akinlo and Iredele (2020), Uwuigbe et al. (2021), and Hassan and Umar (2022), who documented similar positive impacts of environmental disclosures on performance, potentially due to improved corporate image and investor confidence. In contrast, the results for governance cost disclosure (GCD) also show a positive but marginally insignificant effect on performance ($\beta = 0.2026$, $p = 0.0563$), despite a significant Granger causality direction from GCD to OP.

This mixed outcome supports earlier findings by Okafor and Onwumere (2018) but contrasts with the more definitive positive relationship found by Olayiwola and Alade (2023), possibly due to contextual differences in board composition or regulatory enforcement. For social responsibility cost disclosure (SCD), the regression results confirm a significant positive impact on performance ($\beta = 0.2741$, p = 0.0446), echoing the assertions of Nwaiwu and Joseph (2018) and Yusuf and Adebayo (2022), while the non-directional Granger causality suggests mutual influences might evolve over time. These results collectively support stakeholder and legitimacy theory assumptions, affirming that transparent sustainability reporting can serve as a tool for enhancing firm legitimacy, stakeholder engagement, and operational success.

Methodologically, the robustness of the study is underscored by diagnostic checks: the absence of multicollinearity (VIF < 10), homoscedasticity (Breusch-Pagan $p = 0.3152$), and normality of residuals (Jarque-Bera$p$ = 0.4105), ensuring that the regression results are reliable. The findings also address the research questions directly by providing empirical evidence that all three forms of sustainability disclosure either significantly or marginally influence performance. These insights contribute to filling identified gaps in the literature—especially the limited empirical work specific to the Nigerian consumer goods sector—by introducing a more granular disclosure categorization (ECD, SCD, GCD) and linking it rigorously to firm performance. Moreover, this study enriches the debate on sustainability disclosure by revealing that while environmental and social disclosures are strong predictors of performance, governance disclosures may require stronger institutional frameworks to yield measurable impact. Contextual influences such as cultural attitudes toward corporate transparency, the evolving regulatory environment, and firm-specific sustainability strategies may have moderated the strength of these relationships. Theoretically, the findings extend the applicability of legitimacy and stakeholder theories in emerging economies, and practically, they highlight the need for integrated sustainability frameworks and stronger ESG enforcement policies. These results offer pathways for regulatory reforms, improved stakeholder dialogue, and avenues for future research to explore sectoral differences or longitudinal effects, thereby enhancing both scholarly understanding and corporate strategy development in sustainability performance.

Conclusion

The impact of social responsibility, environmental, and governance-related sustainability cost disclosures on the operational performance of Nigerian consumer goods companies that are listed was investigated in this study. The results of the study, which employed strong econometric methods such as multiple regression, correlation analysis, and diagnostic tests, showed that while disclosures pertaining to governance had a positive but marginally insignificant effect on operating performance, disclosures pertaining to environmental and social responsibility costs had statistically significant positive effects. These results demonstrate the strategic significance of open and responsible sustainability reporting in raising investor confidence, business performance, and long-term competitiveness in the consumer goods industry.

Furthermore, by validating stakeholder and legitimacy theoretical frameworks and addressing contextual gaps in the literature, particularly in the Nigerian context, the study makes a significant contribution to the body of knowledge. The diagnostic tests revealed no signs of autocorrelation, heteroskedasticity, or multicollinearity, confirming the validity and reliability of the regression model. The findings point to useful recommendations for regulators, legislators, and corporate managers looking to improve disclosure procedures and further incorporate sustainability into business plans. Future research could build on these findings by examining governance features at the firm level or using panel data collected over an extended period of time to more thoroughly capture dynamic effects.

Recommendations

The study's conclusions lead to a number of practical suggestions for improving sustainability cost disclosure in Nigerian listed consumer goods companies in order to improve operating performance. First, since the study found a strong positive correlation between ECD and firm performance, businesses should implement structured environmental cost disclosure frameworks. To guarantee consistency, transparency, and comparability of disclosures, businesses are urged to implement globally accepted environmental reporting standards like the Global Reporting Initiative (GRI). In order to improve stakeholder trust and long-term sustainability, regulators like the Corporate Affairs Commission (CAC) and the Financial Reporting Council of Nigeria (FRCN) should also require and enforce adherence to environmental reporting standards.

Second, given the significant influence of social responsibility cost disclosure on operating performance, management should prioritize investments in social initiatives, such as employee welfare, community development, and customer engagement, and ensure these efforts are adequately disclosed in annual reports. Furthermore, boards should strengthen governance structures and enhance the disclosure of governance-related sustainability costs by aligning board composition, ethics, and risk management policies with sustainability principles. This will further support firm performance and accountability. Lastly, policymakers should consider revising corporate governance codes to explicitly include sustainability disclosure requirements, while researchers should further investigate the long-term effects of such disclosures across different sectors and economic conditions in Nigeria.

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