ENVIRONMENTAL SUSTAINABILITY DISCLOSURE AND MARKET PERFORMANCE OF LISTED CONSUMER GOODS FIRMS IN NIGERIA

ABSTRACT

This study aimed to examine the effect of environmental sustainability disclosure on the market performance of listed consumer goods firms in Nigeria. This study utilized ex-post facto research design. Data were gathered from the annual reports, sustainability disclosures, and financial databases of Nigerian consumer goods manufacturing firms listed on the Nigerian Exchange Group (NGX) as of December 31, 2023. The study encompassed a population of 21 listed consumer goods manufacturing firms in Nigeria. A census sampling technique was adopted, to investigate the entire population. The research covered a twelve-year period, from 2012 to 2023, to observe trends, patterns, and long-term impacts, enabling a robust analysis. This study employed descriptive statistics (mean, median, variance, standard deviation, skewness, and kurtosis) and inferential statistics (panel regression analysis, correlational analysis etc.) to conduct data analysis. This regression analysis conducted revealed that both environmental protection cost disclosure, and environmental research and development cost disclosure had positive and significant effect on the market performance of listed consumer goods firms in Nigeria. While environmental pollution cost disclosure had a negative but significant effect on market performance. Whereas environmental waste management control cost disclosure had positive and insignificant effect on market performance. The findings indicate that environmental cost disclosures play a significant role in shaping the market performance of consumer goods firms in Nigeria. Specifically, disclosures related to environmental protection and R&D have a positive impact, as they reflect a firm's commitment to sustainability and innovation. It was recommended that firms should prioritize and continue to disclose their investments in environmental protection and R&D, as these are positively viewed by investors and enhance market performance.

Keywords: *Environmental sustainability disclosure; Environmental research and development costs disclosure; Environmental waste management control cost disclosure; Environmental pollution control cost disclosure; Environmental protection cost disclosure; market performance.*

1. INTRODUCTION

Market performance is a vital indicator of a company's financial success and overall health (Dagunduro et al., 2024). Despite its importance, companies often face several practical challenges that can hinder their market performance, particularly in volatile markets like Nigeria. One of the key issues affecting market performance is the fluctuating macroeconomic environment (Kolawole et al., 2024). Nigeria, as an emerging market, is often impacted by high inflation rates, volatile foreign exchange, and unpredictable regulatory policies, all of which create uncertainty in the business environment (Adewuyi & Emmanuel, 2022). For instance, between 2022 and 2023, the Nigerian inflation rate hovered around 21%, significantly affecting consumer purchasing power and reducing profitability for consumer goods firms (National Bureau of Statistics [NBS], 2023).

This economic volatility undermines the confidence of both local and foreign investors, leading to declining stock prices and overall market underperformance (Dada et al., 2023).

The level of transparency in corporate governance and sustainability practices is paramount (Liu & Wang, 2023). Investors are increasingly prioritizing environmental, social, and governance (ESG) factors when evaluating the long-term viability of companies (Lawal et al., 2024). A lack of robust sustainability disclosures or poor governance practices can negatively affect market performance, as stakeholders may view these as risks to future earnings (Okoye & Ebe, 2021). Studies have shown that companies with inadequate sustainability reporting tend to suffer from lower market valuations due to reduced investor confidence (Oba & Fodio, 2022).

In addition to macroeconomic and governance issues, firms in Nigeria's consumer goods sector also face operational challenges, such as supply chain disruptions, rising energy costs, and infrastructure deficits (Dagunduro et al., 2024). For example, the cost of electricity in Nigeria increased by nearly 50% in 2022, placing an additional burden on manufacturing firms, which in turn affected their profitability (Nigeria Electricity Regulatory Commission [NERC], 2022). These operational inefficiencies directly impact the bottom line and market performance. Furthermore, companies in Nigeria often struggle with capital access issues. High borrowing costs, coupled with stringent banking regulations, limit the ability of companies to raise capital for expansion or restructuring. According to the Central Bank of Nigeria (CBN), the average lending rate to businesses was around 18.5% in 2023, which discourages investment in growth initiatives (CBN, 2023). This capital constraint impedes companies' ability to improve their market position and long-term profitability.

The effect of external shocks, such as the global pandemic and geopolitical tensions, on market performance. For example, the COVID-19 pandemic led to a sharp decline in global demand for products, affecting companies' sales and stock prices (Adekoya & Ojo, 2023). Similarly, disruptions in global supply chains due to geopolitical issues have significantly impacted the availability of raw materials, leading to production slowdowns and reduced market performance.

In recent years, environmental sustainability has emerged as a critical issue for firms operating in various sectors, including the consumer goods industry (Gerged et al., 2024). As businesses face increasing pressure from stakeholders, governments, and global markets, there has been a growing demand for corporate accountability regarding environmental practices (Boluwaji et al., 2024).

According to Lawal et al. (2024), one of the ways firms demonstrate their commitment to sustainability is through environmental sustainability disclosure (ESD). This practice involves communicating a company's efforts to manage its environmental impact through reports that highlight measures such as waste reduction, energy efficiency, and carbon emission control (Oba & Fodio, 2022).

The relevance of environmental sustainability disclosure has been amplified by the global shift towards responsible investment, where investors increasingly consider a firm's environmental, social, and governance (ESG) practices when making investment decisions (Egbunike & Odum, 2023). In the Nigerian context, the regulatory environment has also evolved, with the Securities and Exchange Commission (SEC) mandating listed companies to provide more transparency in their sustainability practices (Okoye & Ebe, 2021). However, the extent to which ESD influences the market performance of listed consumer goods firms in Nigeria remains an area that requires further empirical investigation.

Previous studies have offered mixed findings on the relationship between environmental sustainability disclosure and market performance. For instance, while some studies have found a positive relationship between sustainability practices and market performance performance, attributing this to improved investor confidence and customer loyalty (Adewuyi & Emmanuel, 2022), others have found no significant impact, suggesting that the costs associated with sustainability initiatives may outweigh their financial benefits in the short term (Adekoya & Ojo, 2023). Therefore, this study seeks to examine the effect of environmental sustainability disclosure on the market performance of listed consumer goods firms in Nigeria. By focusing on this sector, which is pivotal to the Nigerian economy, the research aims to provide insights into whether sustainability reporting can enhance market performance, thereby contributing to the ongoing discourse on corporate sustainability and financial outcomes.

2. LITERATURE REVIEW

2.1.1 Market Performance

Market performance refers to the ability of a firm to generate financial returns for its shareholders, typically measured through key financial metrics such as stock price appreciation, Tobin's Q, return on equity (ROE), and return on assets (ROA) (Awotomilusi et al., 2023). Market performance is the extent to which a company is able to sustain and improve its market share

relative to its competitors in the same industry, reflecting its competitive strength and market dominance (Odugbemi & Igbekoyi, 2021). Market performance is the firm's capacity to create value for stakeholders, including shareholders, customers, and employees, through sustained profitability, innovation, and superior product offerings that drive long-term growth (Boluwaji et al., 2024). Market performance encompasses the overall financial and non-financial outcomes of a company that satisfy the expectations of stakeholders, including investors, regulators, and the community, particularly through adherence to environmental, social, and governance (ESG) standards (Aluko et al., 2022). Market performance is the degree to which a company's activities contribute to the broader economy, including its contribution to GDP, job creation, and industry growth, often reflected in its profitability, market capitalization, and efficiency in resource utilization (Dagunduro et al., 2023).

2.1.2. Environmental Sustainability Disclosure

Environmental sustainability disclosure refers to the formal process through which companies report their environmental impact and compliance with regulations, including emissions, energy usage, and waste management, as mandated by regulatory bodies (Asubiojo et al., 2023). Environmental sustainability disclosure is the voluntary practice of communicating a company's environmental initiatives, strategies, and performance to stakeholders, aimed at showcasing the company's commitment to reducing its ecological footprint and promoting sustainability (Dagunduro et al., 2024). Environmental sustainability disclosure is the process through which firms provide information about their environmental policies, practices, and outcomes to stakeholders, ensuring transparency and accountability in how they manage their ecological responsibilities (Kolawole et al., 2023). Environmental sustainability disclosure involves the quantification and reporting of a company's environmental performance, including carbon emissions, resource utilization, and waste management practices, to evaluate how well a firm is meeting its sustainability goals (Akinadewo et al., 2023). Environmental sustainability disclosure is the integration of environmental reporting into corporate governance practices, where firms disclose how their board of directors and management oversee environmental risks and implement sustainability initiatives as part of long-term strategy (Boluwaji et al., 2024).

2.1.2.1 Environmental Research and Development Expenditure Disclosure

Environmental research and development (R&D) expenditure disclosure refers to the process by which companies report their financial investments in R&D projects aimed at developing environmentally sustainable technologies, products, or processes (Khan et al., 2019). Environmental research and development (R&D) expenditure disclosure is the communication of funds allocated to innovative projects and scientific research aimed at addressing environmental challenges, such as reducing carbon emissions, improving energy efficiency, or developing renewable resources (Zhang et al., 2020). Environmental research and development (R&D) expenditure disclosure involves companies providing transparent reporting on the financial resources they commit to research and development activities focused on environmental sustainability, as a way to show accountability to stakeholders for their ecological impact (Nurshabrina et al., 2024). Environmental research and development (R&D) expenditure disclosure is the formal disclosure of a company's financial commitment to environmental research and innovation, reflecting the firm's dedication to long-term sustainability and its role in mitigating environmental risks (Kurawa & Shuaibu, 2022). Environmental research and development (R&D) expenditure disclosure refers to the practice of reporting financial data related to the company's strategic investments in environmentally focused research and development, aimed at fostering innovation for future sustainable business practices (Egbunike & Odum, 2023).

2.1.2.2 Environmental Waste Management Control Cost Disclosure

Environmental waste management control cost disclosure refers to the practice of reporting the financial costs incurred by a company to manage, reduce, and dispose of waste in a manner that minimizes environmental impact, ensuring transparency for stakeholders (Kim & Lee, 2023). Environmental waste management control cost disclosure is the formal communication of a firm's expenses related to waste management systems, such as recycling, treatment, and disposal, as part of its broader sustainability reporting efforts (Luo et al., 2024). Environmental waste management control cost disclosure involves providing detailed financial information on waste management expenditures to demonstrate compliance with environmental regulations and waste management standards (Oba & Fodio, 2022). Environmental waste management control cost disclosure refers to the disclosure of the investments made by a firm in controlling and reducing waste output, showing the company's accountability towards its environmental footprint and efforts in pollution control (Jafari & Nikbakht, 2023). Environmental waste management control cost disclosure is the process of revealing the costs associated with waste management activities that aim to optimize

operational efficiency by reducing waste production and implementing environmentally friendly waste disposal methods (Kolawole et al., 2023).

2.1.2.3 Environmental Protection Cost Disclosure

Environmental protection cost disclosure refers to the process by which companies report the financial resources allocated to activities aimed at ensuring compliance with environmental regulations, such as pollution control measures and emission reductions (Igbekoyi et al., 2021). Environmental protection cost disclosure is the practice of disclosing the costs related to initiatives that protect the environment, such as investments in renewable energy, waste management, and conservation efforts, as part of a company's sustainability reporting (Etim & Akpan, 2023). Environmental protection cost disclosure involves the detailed reporting of a firm's expenditures dedicated to mitigating environmental risks and preserving natural resources, demonstrating corporate responsibility and commitment to environmental stewardship (Adhania & Nurdiana, 2024). Environmental protection cost disclosure refers to the transparent reporting of financial commitments made towards environmental protection initiatives, reflecting how these efforts are integrated into the company's corporate governance and risk management strategies (Chen & Wu, 2021). Environmental protection cost disclosure is the communication of the costs incurred by a company in its efforts to reduce environmental impact, such as energy efficiency improvements, waste reduction programs, and water conservation, as part of an overall strategy to enhance operational sustainability (Adewuyi & Emmanuel, 2022).

2.1.2.4 Environmental Pollution Control Cost Disclosure

Environmental pollution control cost disclosure refers to the formal reporting of costs associated with measures taken by a company to comply with environmental regulations and standards aimed at controlling pollution, such as emissions reduction, wastewater treatment, and hazardous waste management (Gerged et al., 2024). Environmental pollution control cost disclosure involves disclosing the financial expenditures a company allocates to pollution control initiatives as part of its broader corporate social responsibility efforts, aimed at minimizing the negative environmental impact of its operations (Zhang et al., 2020). Environmental pollution control cost disclosure is the process of communicating the costs incurred in implementing pollution mitigation strategies, including investments in cleaner technologies, pollution reduction systems, and waste management, as part of a company's sustainability reporting (Boluwaji et al., 2024).

Environmental pollution control cost disclosure refers to the detailed reporting of costs associated with pollution prevention and control measures, which are part of a company's risk management strategy to reduce environmental liabilities and mitigate potential regulatory penalties (Lawal et al., 2024). Environmental pollution control cost disclosure is the communication of expenses incurred in pollution control activities, aimed at improving the firm's operational efficiency and reducing the environmental impact of its production processes through cleaner, more efficient technologies (Kolawole et al., 2023).

2.2 Theoretical Framework

This study was hinged on stakeholder theory. Stakeholder theory, propounded by R. Edward Freeman in 1984, posits that businesses should be accountable not only to shareholders but to all stakeholders affected by the company's activities. These stakeholders include employees, customers, suppliers, communities, and the environment. The theory assumes that a firm's success is interdependent on managing relationships with various stakeholders, promoting transparency, accountability, and ethical considerations (Dagunduro et al., 2022). Environmental sustainability disclosure aligns with the stakeholder theory's assumption that a company's performance is influenced by its relationships with various stakeholders (Freeman, 1984). Disclosing environmental practices fosters trust and engagement, especially with environmentally conscious investors and consumers, potentially leading to better market performance. Stakeholder theory assumes that transparency, such as through ESD, helps a firm align with societal and environmental expectations, which can enhance reputation and long-term market performance (Clarkson et al., 2011). The theory assumes that addressing stakeholder concerns, such as environmental sustainability, can lead to long-term value creation rather than short-term profit maximization (Donaldson & Preston, 1995).

Several studies underpinned by stakeholder theory, such as Clarkson et al. (2011) found that firms with better environmental disclosures experienced enhanced market performance, as transparency in environmental matters strengthened stakeholder trust and firm reputation. Similarly, Reverte (2012) examined the relationship between CSR disclosures, including environmental sustainability, and financial performance. It was found that firms with comprehensive environmental disclosures attracted investors, leading to improved market performance. Furthermore, Michelon et al. (2015) findings suggested that when companies provide detailed and

credible environmental information, stakeholders respond positively, leading to improved financial and market outcomes.

Environmental sustainability disclosure is a tool for companies to engage with a wide array of stakeholders, addressing concerns related to environmental impact. By disclosing sustainability efforts, firms can improve their relationships with key stakeholders such as investors, regulators, and consumers who prioritize sustainability, thereby positively influencing market performance (Michelon et al., 2015). Firms that are transparent about their environmental performance often enjoy enhanced reputation and credibility, leading to increased investor confidence and improved market performance. ESD serves as a signal to stakeholders that a company is committed to long-term sustainability, thus aligning with the stakeholder theory's focus on trust and accountability (Clarkson et al., 2011). Investors increasingly prefer companies that align with environmental sustainability principles. Firms disclosing such information are more likely to attract socially responsible investors (SRI), leading to better market performance and aligning with the stakeholder theory's emphasis on catering to broader stakeholder interests (Reverte, 2012).

Critics argue that stakeholder theory is vague in defining which stakeholders should be prioritized and how to balance their conflicting interests. The theory does not provide clear guidance on how firms can address environmental sustainability concerns while maximizing market performance (Jensen, 2002). Stakeholder theory is often criticized for placing too much emphasis on ethical considerations and not enough on business realities, such as profitability and competitiveness. Companies may face difficulties in balancing environmental sustainability disclosure with immediate financial goals (Sundaram & Inkpen, 2004). Opponents argue that adhering to stakeholder theory by incorporating extensive environmental disclosures can strain corporate resources, particularly for small firms, which may struggle to balance stakeholder demands with economic survival (Margolis & Walsh, 2003). Stakeholder theory has been criticized for assuming that all stakeholder interests can be balanced. In reality, conflicts between environmental stakeholders and shareholders may arise, especially when environmental initiatives negatively impact short-term profits (Heath & Norman, 2004). However, stakeholder theory provide a valuable understanding for the nexus between environmental sustainability disclosure and market performance in this study.

2.3 Empirical Review

This research examined pertinent literature concerning environmental sustainability disclosure and market performance. The meta-analysis conducted by Chen and Wu (2021) synthesized findings from various studies on environmental R&D cost disclosure and firm performance. Their comprehensive review revealed a consistent positive relationship between the transparency of environmental R&D expenditures and firm financial performance across different industries and geographic regions. This suggests that firms disclosing their environmental R&D costs tend to experience improved financial outcomes, highlighting the importance of transparency in environmental reporting for enhancing firm performance. Furthermore, Zhang et al. (2020) found that firms with strong corporate governance structures derived greater financial benefits from transparent environmental R&D expenditure reporting, emphasizing the role of governance practices in leveraging environmental initiatives for improved performance. This underscores the significance of not only disclosing environmental R&D costs but also having effective governance mechanisms in place to maximize the financial impact of such disclosures.

The research conducted by Jafari and Nikbakht (2023) focused on the impact of environmental waste management disclosure on the financial performance of manufacturing firms in Iran. Utilizing panel data analysis covering 150 manufacturing firms listed on the Tehran Stock Exchange, the study found a significant positive relationship between environmental waste management disclosure and firm performance, indicating that companies with better environmental practices tend to perform better financially. Similarly, Kim and Lee (2023) examined the effect of environmental waste management reporting on the market performance of South Korean firms. Their mixed-methods approach combining quantitative regression analysis with qualitative case studies revealed that companies with higher levels of environmental disclosure had better stock market performance, highlighting increased investor confidence and higher market valuations.

Nurshabrina et al. (2024) conducted a study analyzing PT Jamkrindo's financial performance over 2019-2021 and its Sustainability Report's disclosure on economic, environmental, and social aspects. Utilizing a descriptive quantitative approach, they found improved financial performance, particularly in profitability ratios, alongside fluctuations in solvency and liquidity ratios. The Sustainability Report scored highest in 2020, with the economic aspect dominant. This study offers insights into PT Jamkrindo's financial performance and sustainability reporting practices. In contrast, Etim and Akpan (2023) examined sustainability

disclosure's impact on oil and gas companies' financial performance from 2012 to 2021. Their findings highlighted significant positive effects of sustainability disclosures on return on capital employed, emphasizing the importance of transparent reporting in enhancing financial performance within the oil and gas sector. Similarly, Luo et al. (2024) found that corporate size and performance positively influence Environmental Information Disclosure quality, suggesting measures to enhance corporate competitiveness and values. Meanwhile, Kolawole et al. (2023) explored the impact of environmental accounting practices on the financial performance of Nigerian aviation companies, revealing a complex relationship between environmental initiatives and financial performance within the aviation industry in Nigeria.

Adhania and Nurdiana (2024) conducted a study on the relationship between financial performance, firm size, company age, and sustainability report disclosure among non-financial companies listed on the IDX. Utilizing quantitative secondary data from financial reports and employing multiple linear regression analysis, their findings indicated that profitability significantly influences sustainability report disclosure, while firm size and company age had no significant effects. In contrast, Gerged et al. (2024) investigated the role of environmental management accounting (EMA) in improving firm performance, particularly in SMEs in Pakistan. Through primary data collection via questionnaire surveys, they found a significant direct link between EMA and firm performance, with stakeholder integration enhancing its impact. Conversely, Igbekoyi et al. (2021) investigated the influence of firms' profitability and liquidity status on their environmental reporting. Utilizing an Ex-post Facto Research Design and secondary data analysis, they found profit after tax significantly influenced environmental sustainability reporting practices among manufacturing firms, while earnings per share exhibited a positive but statistically insignificant effect, and liquidity ratio showed a negative and statistically insignificant relationship. These studies collectively underscore the multifaceted dynamics governing sustainability reporting, environmental management practices, and their impact on firm performance. Thus, this study state hypothesis as follows:

H_{01}: Environmental sustainability disclosure has no significant effect on market performance of listed consumer goods firms in Nigeria.

2.4 Conceptual Framework

Figure 1 below depicts the interaction between the variables under study. Environmental sustainability disclosure (independent variable) and market performance (dependent variable).

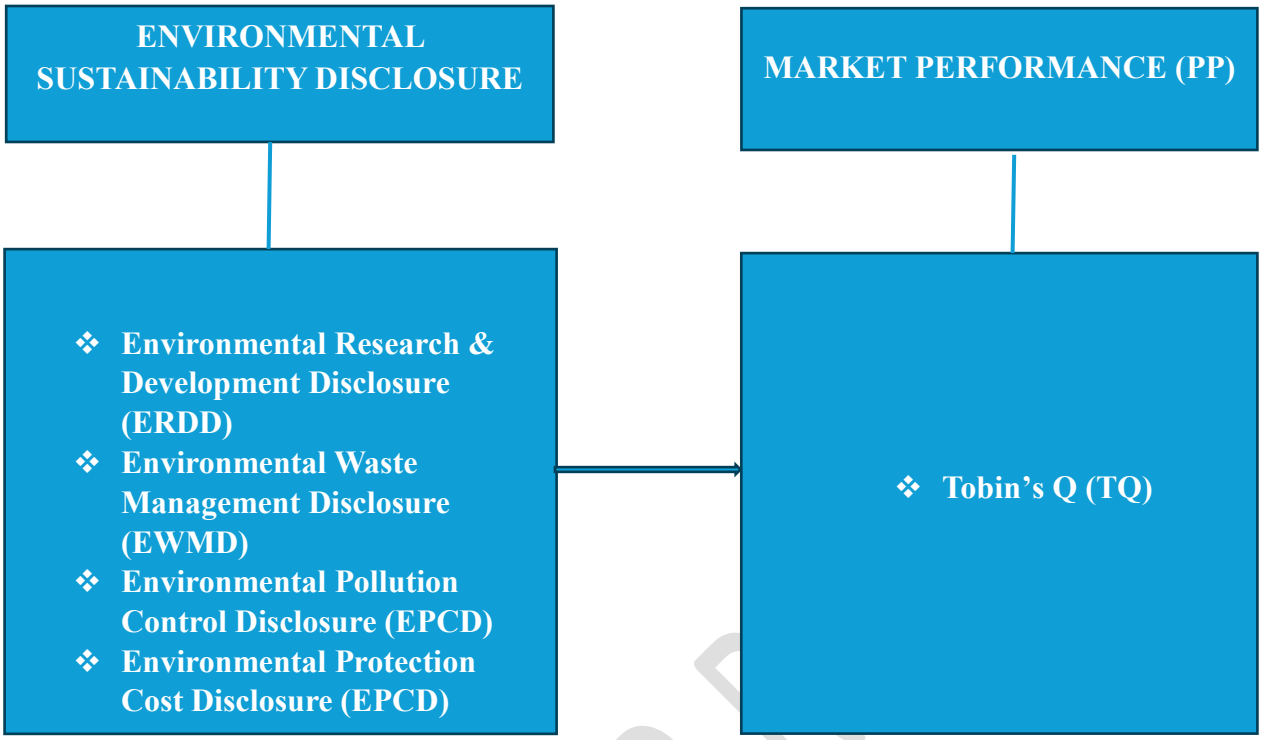

Figure 1: Conceptual Framework
Source: Authors' Design (2024)

3. METHODOLOGY

This study utilized *ex-post facto* research design. Data were gathered from the annual reports, sustainability disclosures, and financial databases of Nigerian consumer goods manufacturing firms listed on the Nigerian Exchange Group (NGX) as of December 31, 2023. The study encompassed a population of 21 listed consumer goods manufacturing firms in Nigeria. A census sampling technique was adopted, encompassing 100% of the population. The research covered a twelve-year period, from 2012 to 2023, to observe trends, patterns, and long-term impacts, enabling a robust analysis. This study employed descriptive statistics (mean, median, variance, standard deviation, skewness, and kurtosis) and inferential statistics (panel regression analysis, correlational analysis etc.) to conduct data analysis.

3.1 Model Specification

This study adapted its econometric model from Kurawa and Shaibu's (2022), which investigated the relationship between environmental disclosure and the financial performance of listed non-financial companies in Nigeria. In this study, financial performance is replaced with market performance as the dependent variable.

$MPit = \alpha 0 + \beta_1 ERDDit + \beta_2 EWMD + \beta_3 EPCDit + \beta_4 EPCDit + Ɛit$.... (i)

Where:

MP = Market Performance

ERDD = Environmental Research & Development Expenditure Disclosure

EWMD = Environmental Waste Management Control Cost Disclosure

EPCD = Environmental Pollution Control Cost Disclosure

ENPD = Environmental Protection Cost Disclosure

α = Constant Term

β = Coefficient Term

i = No of firms

t = Time Period

e = Error term

A priori expectation= $\beta 1 > 0$; $\beta 2 > 0$; $\beta 3 > 0$

3.2 Measurement and Description of Variables

Table 1 shows the description, measurement, data source, and literature evidence of the investigated variables.

Table 1: Measurement and Description of Research Variables

SN	Variable	Description	Measurement	Literature Evidence
1a	Tobin's Q (TQ)	Tobin's Q is an economic metric that compares the market value of a company's assets to the replacement cost of those assets.	Measured as market capitalization divided by total asset	Oluwagbade et al. (2023); Awotomilusi et al. (2023)
2a	Environmental Research and Development Disclosure (ERDD)	Environmental Research and Development (R&D) Disclosure involves the reporting of a company's investments, initiatives, and outcomes related to environmental research and	The Environmental Disclosure Index (EDI) receives a score of 3 when fully compliant with the Global Reporting Initiative (GRI), a score of 2 when partially compliant, a score of 1 when not compliant, and a score of 0 when no environmental information is disclosed by the investigated firms.	Mohammad et al. (2020); Kurawa and Shuaibu (2022)

		development activities.		
2b	Environmental Waste Management Disclosure (EWMD)	Environmental Waste Management Disclosure involves the reporting of a company's practices, policies, and performance related to the management and disposal of waste generated from its operations.	The Environmental Disclosure Index (EDI) receives a score of 3 when fully compliant with the Global Reporting Initiative (GRI), a score of 2 when partially compliant, a score of 1 when not compliant, and a score of 0 when no environmental information is disclosed by the investigated firms.	Mohammad et al. (2020); Kurawa and Shuaibu (2022)
2c	Environmental Pollution Control Disclosure (EPCD)	Environmental Pollution Control Disclosure involves the reporting of a company's efforts, initiatives, and outcomes related to controlling and reducing pollution from its operations.	The Environmental Disclosure Index (EDI) receives a score of 3 when fully compliant with the Global Reporting Initiative (GRI), a score of 2 when partially compliant, a score of 1 when not compliant, and a score of 0 when no environmental information is disclosed by the investigated firms.	Mohammad et al. (2020); Kurawa and Shuaibu (2022)
2d	Environmental Protection Cost Disclosure (EPND)	Environmental Protection Cost Disclosure involves the reporting of a company's expenditures, investments, and activities related to environmental protection measures.	The Environmental Disclosure Index (EDI) receives a score of 3 when fully compliant with the Global Reporting Initiative (GRI), a score of 2 when partially compliant, a score of 1 when not compliant, and a score of 0 when no environmental information is disclosed by the investigated firms.	Mohammad et al. (2020); Kurawa and Shuaibu (2022)

Source: Researchers' compilation (2024).

4 DATA ANALYSIS AND DISCUSSION OF FINDINGS

This section explains the characteristics of the variables used, data analysis, and study findings. These statistics summarise the variable distribution, including the mean and standard deviation.

4.1 Descriptive Statistics

Table 2 contains statistics for each variable, as well as information on their distribution and features across data. In this case, each variable had 252 observations, indicating that data was collected from 21 entities during a twelve-year period. This identifies the number of data points or observations in the sample. Conversely, the average value of ENPD is 0.9167. This implies that most firms are not fully compliant with the Global Reporting Initiative (GRI) standards for environmental protection cost disclosure. While the minimum is 0, and the maximum is 3, there is a moderate spread of 0.8910, with scores ranging from 0 (no disclosure) to 3 (fully compliant). The ENPD distribution is positively skewed, with a skewness of 0.7730. The distribution is platykurtic, as demonstrated by a kurtosis of roughly 2.8839 (less than 3).

Additionally, the mean size of EPCD is 0.9206, while the standard deviation is 0.8846. The average score is slightly below 1, indicating that most firms are not fully compliant with GRI standards for Pollution Control. The standard deviation shows variability across firms at 0.8846 while the minimum is 0 and the maximum is 3. The EPCD has a skewness of 0.7779, which indicates that it is positively skewed. The distribution is platykurtic, with a kurtosis of roughly 2.9355, which is less than 3. Again, the average value of EWMD is 1.0079, while the standard deviation is 0.9233. This suggests that firms tend to disclose slightly more on Waste Management. However, there's still substantial variation, with some firms not disclosing anything and others fully compliant at a Minimum of 0 and a Maximum of 3. A skewness of 0.7145 indicates that the distribution is positively skewed with respect to its form. The kurtosis of the distribution is less than 3, or roughly 2.7376, indicating that it is platykurtic.

Also, the average value of ERDD is 1.1230 with a standard deviation of 0.9597. This implies that firms tend to be more transparent in disclosing Environmental Protection Costs. The standard deviation shows moderate variation across firms with a minimum value of 0 and a maximum of 4. The distribution exhibits a positive skewness, with a skewness of 0.6738. With a kurtosis of roughly 2.6994, the distribution can be considered platykurtic. However, the size of the mean of Tobin's Q is 9.3754 while the standard deviation is 41.8044. This is significantly higher than 1, indicating that many firms in this sample have a market value exceeding their replacement cost, potentially reflecting overvaluation. However, the extremely high standard deviation suggests substantial variation with a wide range from 0.000186 to 366.0795. This shows that some firms are extremely undervalued, while others are significantly overvalued. The distribution is positively

skewed, as evidenced by a skewness of 7.1717. The distribution is leptokurtic, as demonstrated by a kurtosis of around 58.5119, which is greater than 3.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
ENPD	252	0.9167	0.8910	0.0000	3.0000	0.7730	2.8839
EPCD	252	0.9206	0.8846	0.0000	3.0000	0.7779	2.9355
EWMD	252	1.0079	0.9233	0.0000	3.0000	0.7145	2.7376
ERDD	252	1.1230	0.9597	0.0000	4.0000	0.6738	2.6994
EVA	252	9.3754	41.8044	0.0002	366.0795	7.1717	58.5119

Source: Researchers' Computation, (2024)

4.2 Test of Variables

To ensure reliable regression analysis, all variables were verified to validate the assumptions. This includes pre- and post-estimation tests, which are essential for accurate estimation.

4.2.1 Pre-estimation Test

To make sure the assumptions of the chosen model were satisfied, and the data used for analysis was sufficient, the following tests were conducted. They also aid in preventing misspecification errors and confirming the validity of the model's output.

4.2.1.1 Unit Root Test

The panel unit root test results are shown in Table 3. The Harris-Tzavalis and Breitung unit-root test statistics were computed. The null hypothesis states that panels have unit roots (non-stationary). The alternate theory states that panels are stationary. If the p-value is less than 0.05, the null hypothesis—that the series has a unit root—is rejected; if not, it is accepted. In the Harris-Tzavalis unit-root test, the p-values for ENPD, EPCD, EWMD, and ERDD were all less than 0.05. This suggested that ENPD, EPCD, EWMD, and ERDD were stationary, while the EVA was not stationary.

Table 3: Unit Root Test

Variable	Harris-Tzavalis unit-root		Breitung unit-root test	
	Z-statistics	P-value	Z-statistics	P-value
ENPD	-11.1602	0.000	-4.7998	0.0000
EPCD	-12.1547	0.000	-4.4215	0.0000
EWMD	-10.9453	0.000	-3.696	0.0000
ERDD	-12.8377	0.000	-4.8484	0.0000
EVA	2.3649	0.991	1.6178	0.9471

Source: Researchers' Computation, (2024)

4.2.1.2 Correlation Test

The pairwise correlations between the independent variables are shown in Table 4. According to the study, there is a significant positive association between EPCD and ENPD (0.8610). The relationship between ENPD and EWMD is strong (0.8338). The link between EPCD and EWMD was significant (0.8837), however, the correlation between ENPD and ERDD was relatively strong (0.7948). The relationship between ERDD, EPCD and EWMD respectively, were positively significant at 0.814 and 0.8531 respectively. Except for EVA, the findings demonstrated that there was a strong association between the independent factors.

Table 4: Correlation Analysis

	ENPD	EPCD	EWMD	ERDD	EVA
ENPD	1.0000				
EPCD	0.8610*	1.0000			
	0.0000				
EWMD	0.8338*	0.8837*	1.0000		
	0.0000	0.0000			
ERDD	0.7948*	0.8140*	0.8531*	1.0000	
	0.0000	0.0000	0.0000		
EVA	-0.0085	-0.0022	-0.0266	-0.0390	1.0000
	0.8929	0.9724	0.6747	0.5372	

Source: Researchers' Computation, (2024)

4.2.1.3 Multicollinearity

The degree of multicollinearity in the data distribution was ascertained by the application of variance inflation factor (VIF) analysis. It evaluates whether independent variables in a regression model can be predicted from one another. The EWMD is the one with the greatest VIF score (6.23), although it is still much below the cutoff of 10. This suggests that multicollinearity is absent from the model.

Table 5: Variable Inflation Factor

Variable	VIF	1/VIF
EWMD	6.23	0.160587
EPCD	6.03	0.165773
ENPD	4.45	0.224825
ERDD	4.08	0.245257

Mean VIF	5.2

Source: Researchers' Computation, (2024)

4.2.2 Post estimation Test

The Ramsey RESET was used to ensure that the model functioned properly. The null hypothesis is that the model is correctly specified, while the alternative hypothesis is that the model is incorrectly specified. If the p-value falls below 0.05, the null hypothesis is rejected. Otherwise, the alternative hypothesis is rejected. The p-value of 0.9012 shows that the model was correctly configured. The Shapiro-Wilk test was employed to determine the normality of the data distribution. If the p-value is greater than 0.05, the data is considered regularly distributed; otherwise, normality is not assumed. The data in this situation is not normally distributed as the p-value is 0.0000. Consequently, all variables were transformed. The Breusch-Pagan/Cook-Weisberg test was employed to determine heteroskedasticity in this study. This establishes the significance of a model's independent variables. If the test statistics are not significant, then the residual is homoscedastic; otherwise, it is heteroskedastic.

The results showed heteroskedasticity, with a chi-square of 17.58 and a p-value of 0.0000. The Durbin-Watson test was used to determine the presence of autocorrelation in the data distribution. The model has a positive serial correlation with a d-statistic of 1.3236, which is below the threshold of 2. The f-test results showed an f-statistic of 1.39 and a p-value of 0.1293 for fixed effects and OLS, demonstrating that the OLS model is effective. The Breusch and Pagan Lagrange multiplier test was performed to determine the accuracy of the estimate between the random effect model and the pooled OLS. The test statistic is 0.67, and the p-value is 0.2068, indicating an insignificant finding. This suggested that the random effect influence was more powerful. However, generalized least-squares regression was utilised to assess the information because of autocorrelation and heteroskedasticity.

Table 6: Post Estimation Test

Variable	chi-statistic	P-value
Ramsey RESET test	0.19	0.9012
Breusch-Pagan/Cook-Weisberg test heteroskedasticity	17.58	0.0000
Durbin-Watson	1.3236	
F-Test	1.39	0.1293
Shapiro-Wilk W test	11.449	0.0000
Breusch and Pagan Lagrange Multiplier test	0.67	0.2068

Source: Researchers' Computation, (2024)

Table 7: Regression Analysis

Variable	OLS Model		Fixed Effect Model		Random Effect Model	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
EWMD	1.2215	0.846	2.953	0.68	1.3384	0.833
EPCD	5.0846	0.491	-4.6551	0.61	3.6618	0.628
ENPD	-2.939	0.682	1.5852	0.832	-2.1905	0.76
ERDD	-4.0048	0.474	-1.2644	0.843	-3.5223	0.532
_cons	11.0343	0.008	10.776	0.103	10.9408	0.014
Number of observations	252					
F (3, 206)	0.3		0.08		0.81	
P-value	0.8769		0.9872		0.9386	
R-squared	0.0049					
Adj R-squared	-0.0113					

Source: Researchers' Computation, (2024)

4.3 Environmental Disclosure and Financial Performance

Table 8 presents the results of a generalized least square model, which examines the relationship between the independent variables and the dependent variable. The value of the Wald chi² (4) is 75.89 while the p-value is 0.0000. The Wald chi-squared test evaluates whether the coefficients of the independent variables in the model are jointly equal to zero. The null hypothesis is that all coefficients are zero. Since the p-value is 0.0000, the null hypothesis is rejected. This means that ENPD, EPCD, EWMD, and ERDD have a statistically significant effect on Tobin's Q. Based on this, the environmental disclosure variables, as a group, significantly explain variations in Tobin's Q. Moreover, the coefficient of ENPD is 0.9535 with a p-value of 0.000. this implies that a one-unit increase in ENPD is associated with a 0.9535 increase in Tobin's Q, holding other variables constant. This suggests that firms with better disclosure of environmental protection costs tend to have higher market valuations relative to their assets.

Again, the EPCD coefficient is -4.5766 with a p-value of 0.000. this denotes that a one-unit increase in EPCD is associated with a 4.5766 decrease in Tobin's Q, holding other variables constant. This negative relationship suggests that firms with more comprehensive disclosures on pollution control may be penalized in the market. Also, the EWMD Coefficient is 0.3993 with a p-value of 0.278. EWMD has a positive but insignificant coefficient. This means that there is

insufficient evidence to conclude that EWMD has a meaningful effect on Tobin's Q. Furthermore, the ERDD Coefficient is 2.0629 with a p-value of 0.000. this implies that a one-unit increase in the ERDD is associated with a 2.0629 increase in Tobin's Q, holding other variables constant. This implies that firms with higher ERDD tend to have significantly higher market valuations. Generally, ENPD and ERDD are positively associated with Tobin's Q, suggesting that better environmental transparency tends to increase firm market performance. EPCD has a negative effect on Tobin's Q while EWMD has no statistically significant effect on Tobin's Q.

Table 8: Generalized Least-squares Regression Analysis

TobinQ	Coef.	p-value
ENPD	0.9535	0.0000
EPCD	-4.5766	0.0000
EWMD	0.3993	0.2780
ERDD	2.0629	0.0000
_cons	7.4717	0.0130
Wald chi^2 (4)	75.89	
p-value	0.0000	

Source: Researchers' Computation, (2024)

4.4 Discussion of Findings

This regression analysis conducted revealed that both environmental protection cost disclosure, and environmental research and development cost disclosure had positive and significant effect on the market performance of listed consumer goods firms in Nigeria. This means that when firms disclose costs related to environmental protection efforts (e.g., pollution control, conservation measures), their market performance improves. The significance indicates that this positive effect is statistically strong and not due to chance. Disclosing costs associated with environmental R&D (e.g., developing eco-friendly products or technologies) also boosts market performance. The significance suggests that investors or stakeholders may view such efforts positively, seeing potential long-term benefits.

While environmental pollution cost disclosure had a negative but significant effect on market performance. This implies that disclosing costs related to pollution (e.g., penalties, fines, or costs to mitigate damage) negatively impacts market performance, but the effect is statistically significant. Investors might perceive such disclosures as risks or liabilities, negatively affecting

their confidence in the firm's profitability. Whereas environmental waste management control cost disclosure had positive and insignificant effect on market performance. Although waste management disclosures have a positive relationship with market performance, the effect is not statistically significant. This suggests that waste management efforts, while beneficial, do not strongly influence investor perception or market performance.

5. CONCLUSION AND RECOMMENDATIONS

This study investigates the impact of various environmental cost disclosures on the market performance of listed consumer goods firms in Nigeria. This study employed descriptive statistics (mean, median, variance, standard deviation, skewness, and kurtosis) and inferential statistics (panel regression analysis, correlational analysis etc.) to conduct data analysis. This regression analysis conducted revealed that both environmental protection cost disclosure, and environmental research and development cost disclosure had positive and significant effect on the market performance of listed consumer goods firms in Nigeria. While environmental pollution cost disclosure had a negative but significant effect on market performance. Whereas environmental waste management control cost disclosure had positive and insignificant effect on market performance. The findings indicate that environmental cost disclosures play a significant role in shaping the market performance of consumer goods firms in Nigeria. Specifically, disclosures related to environmental protection and R&D have a positive impact, as they reflect a firm's commitment to sustainability and innovation. In contrast, pollution-related disclosures are viewed negatively, likely due to their association with risk and potential financial burden. Waste management cost disclosures, while positive, do not significantly affect market performance.

The following recommendations were suggested: Firstly, firms should prioritize and continue to disclose their investments in environmental protection and R&D, as these are positively viewed by investors and enhance market performance. Secondly, firms should work towards reducing pollution-related costs and develop strategies to minimize negative disclosures related to environmental liabilities. This could improve investor confidence and market performance. While waste management does not significantly influence market performance, firms should still focus on improving these practices. Increasing transparency and demonstrating efficiency in waste management could eventually strengthen investor trust. Lastly, firms and regulators should work

to improve investor understanding of the long-term benefits of environmental efforts, including waste management, to better align investor perceptions with sustainability goals.

This study contributes to the growing body of knowledge on the intersection of environmental sustainability and corporate performance. It highlights the varying impacts of different types of environmental cost disclosures on market performance, offering insights into how firms can strategically manage their environmental responsibilities while enhancing investor confidence. The findings provide empirical evidence from the Nigerian market, contributing to the global discourse on sustainability and financial performance, particularly in developing economies.

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