Corporate environmental reporting practices and performance of listed manufacturing companies in Nigeria

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Abstract

Purpose – This study aims to provide empirical insights into the impact of corporate environmental reporting practices on the performance of listed manufacturing companies in Nigeria
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Design/methodology/approach – The study adopts an ex-post facto research design and focuses on a population of seventy-six (76) quoted manufacturing firms, from which a sample of sixty-four (64) companies was selected. Data from fifty-two (52) companies with complete datasets were used to ensure a balanced panel model. Panel Corrected Standard Error Model (PCSE) Regression techniques were applied to analyze data obtained from the annual reports and financial statements of the selected companies over a seven-year period (2016–2022).

Findings – The results indicate that environmental policy disclosure, environmental cost disclosure, and environmental performance disclosure significantly influence the performance of the sampled companies at a 5% level of significance. The findings suggest that effective management and reporting of environmental information can positively impact company performance. Among the disclosure types, environmental performance disclosure has the most substantial effect on company performance.

Research limitations/implications – Corporate environmental disclosure is a crucial predictor of company performance. Regulatory bodies should encourage the integration of environmental reporting in annual reports, ensuring compliance with both mandatory and voluntary requirements. Future research could extend these findings by examining other sectors or geographies to generalize the relationship between environmental disclosures and performance.

Originality/value – This study provides a comprehensive examination of the impact of different types of environmental disclosures on corporate performance. By applying PCSE regression, the study offers a robust analysis of the relationships between environmental disclosure practices and performance outcomes in a developing country context, thereby contributing valuable insights to the existing literature on corporate environmental reporting.

Keywords: Corporate Environmental Reporting, Environmental Cost, Environmental Policy, Environmental Performance

1. Introduction

This paper aims to bridge a notable deficiency in current scholarly works on corporate environmental reporting by examining the relationship between the environmental reporting practices and performance of listed manufacturing firms in Nigeria. The research explores the influence of corporate environmental disclosure practices on the performance of these listed manufacturing companies by (i) assessing the impact of environmental cost reporting on financial performance (ii) examining the influence of environmental policies reporting on financial performance and (iii) ascertaining the effect of environmental performance reporting on financial performance with particular focus on listed manufacturing companies in Nigeria because of their environmental sensitivity than other sectors. In the contemporary business environment of today, the achievement of corporate success is no longer solely measured by profitability as it is now widely recognized that a company's performance is not only measured by its economic gains but also by its commitment to environmental sustainability and social responsibility (Usman, 2019). With globalization and industrialization shaping our current era, there has been a proliferation of industries, lowering entry barriers into the market and bolstering the economic standing of nations. However, a significant challenge arises as companies prioritize profit generation often at the expense of exploiting environmental resources (Yusuf, 2023). This strategy results in a range of environmental challenges including the exhaustion of natural resources, alteration in climatic conditions, worldwide increase in temperature, pollution, deterioration, and additional associated risks.

Corporate environmental reporting (CER) has emerged as a crucial component of modern business practices, driven by increasing stakeholder demand for transparency and accountability in environmental stewardship (Qin, et al., 2019). According to a 2023 report by the Global Reporting Initiative, over 90% of the world's largest 250 companies now issue sustainability reports, underscoring the growing recognition of environmental responsibility. This surge in CER adoption is not merely a compliance measure but also reflects a strategic approach to enhancing corporate reputation, stakeholder trust, and competitive advantage. The link between CER and financial performance has garnered significant attention, with studies suggesting that proactive environmental disclosure can lead to improved financial outcomes, including higher profitability and market valuation (Usman, 2024). Empirical evidence supports the positive correlation between robust environmental reporting and financial performance. For instance, a study by Harvard Business Review in 2022 found that firms with comprehensive CER practices experienced a 5% higher return on equity (ROE) compared to those with minimal reporting. Moreover, research by the CFA Institute in 2021 highlighted that companies with strong environmental, social, and governance (ESG) disclosures, which include environmental reporting, showed a 15% increase in their stock prices over a three-year period. These findings indicate that investors and consumers increasingly value transparency in environmental practices, rewarding firms that integrate sustainability into their corporate strategies. This research aims to delve deeper into the specific mechanisms through which CER influences financial performance, providing insights into how firms can leverage environmental reporting to achieve both sustainability and economic objectives.

In developed nations, the mandatory disclosure of environmental information is a well-established practice. Governments and regulatory bodies have implemented stringent guidelines and frameworks to ensure companies provide comprehensive environmental data in their annual reports or standalone sustainability reports. For instance, the European Union's Non-Financial Reporting Directive (NFRD) requires large public-interest companies to disclose information on environmental matters, social and employee-related aspects, and respect for human rights, anti-corruption, and bribery issues. Similarly, in the US, the Securities and Exchange Commission (SEC) mandates public companies to include material environmental information in their filings. Failure to disclose environmental information can have severe implications for companies in developed nations. Non-compliance with mandatory disclosure requirements can lead to legal penalties, fines, and sanctions from regulatory authorities. Additionally, companies may face reputational damage, which can erode stakeholder trust and lead to a decline in customer loyalty (Mu & Lee, 2023). Investors are increasingly prioritizing environmental, social, and governance (ESG) factors in their investment decisions and a lack of transparency in environmental reporting can result in reduced access to capital and higher cost of financing. Moreover, companies might encounter difficulties in establishing partnerships and collaborations with other businesses that prioritize sustainability (Alabi et al., 2024).

The disclosure of environmental information can significantly impact the financial performance of companies in developed nations. Transparent and comprehensive reporting on sustainability practices can enhance a company's reputation, leading to increased customer loyalty and brand value. It can also attract environmentally conscious investors, resulting in improved access to capital and potentially lower costs of financing. Companies that demonstrate a commitment to sustainability may benefit from operational efficiencies and cost savings through better resource management and waste reduction practices. Moreover, environmental disclosure can drive innovation by encouraging companies to adopt new technologies and processes that minimize environmental impact. This proactive approach can open up new market opportunities and revenue streams. Furthermore, companies that are transparent about their environmental performance are better positioned to anticipate and manage risks related to regulatory changes, climate change, and resource scarcity.

In Nigeria and some other African countries, the voluntary nature of sustainability information disclosure leads to significant consequences (Usman, 2024). Without mandatory reporting, corporate entities often operate with minimal accountability and transparency regarding their environmental impact. This opacity hinders regulators, stakeholders, and the public from effectively assessing and addressing corporate environmental performance. The lack of compulsory reporting allows companies to prioritize short-term profits over sustainable practices, resulting in increased pollution and depletion of natural resources, further exacerbating environmental degradation and public health crises. For instance, cities like Onitsha, Kaduna, Aba, and Umuahia suffer from some of the worst air quality globally, contributing to high rates of respiratory and cardiovascular diseases. The economic repercussions of not disclosing environmental information are substantial. Companies that lack transparency in their environmental practices may struggle to attract investment, secure financing, or form international partnerships, hindering economic growth and development. Public trust in corporations diminishes when there is a lack of transparency, potentially leading to social unrest and damaged community relationships. Additionally, regulatory bodies face challenges in enforcing environmental laws without access to detailed environmental reports, resulting in weak regulatory enforcement. Pollution as one of the significant environmental problems caused by the operations of firms worldwide. In Nigeria, according to a 2016 World Health Organization (WHO) report, Onitsha, Kaduna, Aba, and Umuahia were among four of the 20 African cities with the worst air quality globally (WHO, 2016).

Air pollution is literally choking the life out of Nigerians. Both indoors and outdoors, air pollution is killing more urban residents today than ever before. The air pollution in Nigeria is more likely to cause harm than the air in any other African country. Nigeria currently has the highest burden of fatalities from air pollution in Africa and the fourth highest in the world, with 150 deaths per 100,000 people attributable to pollution (WHO, 2016). Additionally, the annual State of the Global Air Report published by the Health Effects Institute (HEI) indicates that air quality in Nigeria and at least 10 other countries is among the deadliest in the world. Higher-than-ambient air pollution death rates result from environmental hazards combined with extreme pollution sources such as generator fumes, vehicle emissions, and crop burning, among others (Usman, 2019).

In the context of Nigeria, the absence of compulsory regulations necessitating companies to disclose their environmental sustainability highlights the voluntary nature of environmental reporting. This absence of reporting regulations raises concerns, especially given Nigeria's ranking as the seventh nation globally for gas flaring and the fourth country in Africa for air pollution, according to the World Bank. The nation's slow response to growing environmental concerns is notable, considering that many Nigerian companies' operations, such as manufacturing, contribute to environmental problems like pollution emissions (Ajide et al., 2024). Meanwhile, there is a lack of comprehensive understanding regarding the extent of environmental information presented in corporate annual reports, along with the disclosure of environmental policies by Nigerian companies and the transparency regarding costs associated with environmental maintenance. Nigeria's response to the growing concern over the environmental aspects of company activities has been notably sluggish. This not only impacts the local environment but also adds to the broader global issue of climate change. A crucial aspect of this discussion involves grasping the complex connection between disclosing environmental information and company's performance, particularly within the manufacturing sector. Corporations are now under growing scrutiny not just for their financial achievements but also for their environmental responsibility (Li et al., 2023). As sustainability takes centre stage, the degree to which companies reveal their environmental practices can significantly affect their overall performance and long-term sustainability.

According to He et al. (2023), the absence of environmental information, particularly regarding expenses related to the environment and compliance with environmental policies by companies, can have significant consequences for various stakeholders. This includes individuals whose livelihoods depend on the environment, such as farmers experiencing land degradation due to corporate activities. The shift towards a stakeholder perspective emphasizes the importance of corporate environmental reporting practices in assessing company performance. While some companies do report environmental activities, especially costs, they may do so primarily to minimize taxes rather than genuinely address environmental concerns (Souguir et al., 2024). Stakeholders currently express an interest in not solely the financial performance, but also in acquiring information pertaining to the social and environmental dimensions of corporations, highlighting the need for more comprehensive and transparent reporting. Despite the negative environmental impact of certain companies, there is a lack of disclosure regarding their environmental performance.

Theoretically, corporate environmental reporting practices, such as environmental cost reporting, environmental policy reporting, and environmental performance reporting, can significantly impact a firm's financial performance through the lens of legitimacy theory. Legitimacy theory suggests that companies seek to operate within the bounds of societal norms and expectations to maintain their legitimacy. By transparently reporting their environmental costs, policies, and performance, firms demonstrate their commitment to sustainable and responsible practices, which can enhance their reputation and trust among stakeholders (Agu et al., 2024). This increased legitimacy can lead to stronger relationships with customers, investors, and regulatory bodies, ultimately resulting in improved financial performance. Firms that actively disclose their environmental efforts are often perceived as more credible and trustworthy, which can attract environmentally conscious investors and customers, driving revenue growth and potentially reducing the cost of capital. Signalling theory further elucidates the impact of corporate environmental reporting on financial performance. According to signalling theory, companies use environmental reporting to signal their quality and commitment to sustainability to the market. By providing detailed and transparent information about environmental costs, policies, and performance, firms can differentiate themselves from competitors and signal their long-term viability and ethical standards. This can lead to positive market reactions, such as increased stock prices and investor confidence (Mu & Lee, 2023). Moreover, comprehensive environmental reporting can indicate efficient management practices and risk mitigation strategies, which are highly valued by investors and can result in lower financing costs. Consequently, firms that engage in robust environmental reporting are likely to experience enhanced financial performance due to improved market perception and investor relations (Yusuf, 2023).

To address the compromised corporate images and maintain financial performance, certain profit-rich companies seem motivated to showcase positive contributions to the environment. They achieve this by providing detailed information on the costs incurred in their social initiatives and in supporting host communities (Ding et al., 2022). However, the reliability of these cost-related details, particularly concerning environmental aspects, may be questionable. In cases where a company recognizes that its performance is influenced by responsible environmental practices, there is a tendency to emphasize appealing sustainability information while omitting crucial negative details that could aid stakeholders in making informed decisions (Welbeck et al., 2017). Despite the considerable focus on shareholder interests in previous research on corporate environmental reporting, there has been a limited number of studies examining corporate environmental disclosure practices and their impact on firm performance. Most previous studies, such as those by Abdul-Latif *et al*., 2023; Kabara *et al*., 2023; Chandula *et al*., 2023; Githaiga, 2023; Coscia's, 2023; Abedin *et al*., 2023; Alkhazalih *et al*., 2023), have primarily investigated various factors influencing corporate environmental reporting.

However, prior empirical research on corporate environmental disclosure can be categorized into five groups. The first group examines the volume of corporate environmental disclosure, often making comparisons across countries, sectors, or media. The second group focuses on the quality of the information disclosed. The third group investigates the determinants of corporate environmental disclosure, while the fourth group explores the relationship between environmental disclosure and corporate environmental performance. Finally, the fifth group of studies analyzes market reactions to corporate environmental disclosure (Andrikopoulos & Kriklani, 2013; Damak-Ayadi, 2010; Jose & Lee, 2007). There are gaps in corporate environmental disclosure studies that need to be addressed. Methodologically, most studies have employed various estimation techniques such as Ordinary Least Squares (OLS) regression, multiple regressions, and ordinary regression (Guastella et al., 2022; Gerged et al., 2021; WanMohammad & Wasiuzzaman, 2021; Pedron et al., 2021; Girón et al., 2021; Boakye et al., 2021; Usman, 2019; Ahmadi & Bouri, 2017; Omoye & Oshilim, 2018; Welbeck et al., 2017; Jariya, 2015; Prasad et al., 2015; Trencansky & Tsaparlidis, 2014; Suttipun & Stanton, 2012). To the best of the researcher's knowledge, no study has utilized Panel Corrected Standard Error Model Regression, which is designed to be robust against violations of assumptions such as serial correlation, constant residuals, and normality.

Conceptually, most studies in Nigeria have used corporate environmental disclosure practices as their dependent variables (Olayinka & Olumayowa, 2014; Che-Ahmad et al., 2015; Ohidoa et al., 2016; Abubakar, 2017; Odoemelam & Okafor, 2018; Omoye & Oshilim, 2018). This study, however, considers corporate environmental disclosure practices as the independent variable and company performance as the dependent variable, positing that well-managed environmental disclosure practices can positively influence company performance, given the diverse information needs of annual report users. Additionally, most Nigerian studies on environmental reporting have focused primarily on listed oil and gas companies and other industrial goods companies, neglecting other environmentally sensitive sectors such as consumer goods, construction/real estate, and health. Furthermore, previous studies have measured financial performance using various metrics like Return on Capital Employed (ROCE), Return on Assets (ROA), Return on Equity, Net Profit Margin, and Gross Profit Margin. This study deviates by using Tobin’s Q, based on the premise that real profitability occurs when additional wealth is created for shareholders, with projects generating returns above their cost of capital.

The study encompasses all seventy-six (76) manufacturing companies listed on the Nigerian Exchange Group as at December 2022. These companies were selected due to their recognized environmental sensitivity compared to others (Welbeck et al., 2017). Additionally, the study spans a seven-year period from 2016 to 2022. The choice of 2016 as the starting point is attributed to the release of the 2016 Corporate Governance Code by the Nigerian Financial Reporting Council, which includes guidelines for various sectors, and the launch of the Global Reporting Initiative's (GRI) 101, defining reporting principles for sustainability reports. Furthermore, 2022 marks the latest year of data collection for this study, capturing the post-period affected by the industrial global downturn due to the Covid-19 Pandemic.

The remainder of the paper is organized as follows. Section 2 discusses corporate environmental regulations and reporting reforms in Nigeria, 3. Theoretical framework, 4. Empirical literature review and hypotheses development, 5. Research design, 6. Empirical results and discussion, while section 7 outlines the summary and conclusion.

2. Corporate environmental reporting regulations and reporting reforms in Nigeria

Corporate environmental reporting in Nigeria has evolved significantly over the years, driven by a growing awareness of environmental sustainability and the need for corporate accountability. This evolution is also influenced by global trends and pressures, as well as local challenges such as pollution, resource depletion, and the social impacts of industrial activities. Understanding the regulatory landscape and the ongoing reforms in Nigeria is crucial for comprehending how companies disclose their environmental practices and the implications for stakeholders. Empirical data on corporate environmental reporting in Nigeria highlights the progress and challenges in this area. According to a study by Odoemelam and Okafor (2018), approximately 45% of listed companies in Nigeria disclosed some form of environmental information in their annual reports. However, the quality and comprehensiveness of these disclosures vary significantly across industries. A survey conducted by the Financial Reporting Council of Nigeria (FRCN) in 2020 revealed that about 30% of companies reported their environmental policies, while only 20% disclosed detailed environmental performance metrics. The survey also highlighted that the oil and gas sector leads in environmental reporting due to the high environmental impact of their operations and the regulatory pressure they face.

Meanwhile, Nigeria's regulatory framework for environmental reporting is still developing, with several key institutions playing critical roles in shaping the landscape (Elaigwu et al., 2024). The Federal Ministry of Environment is the primary governmental body responsible for environmental protection and regulation in Nigeria. It sets policies and guidelines to ensure sustainable environmental practices. The Ministry's efforts are crucial in promoting corporate environmental responsibility. National Environmental Standards and Regulations Enforcement Agency (NESREA) is an important regulatory agency under the Federal Ministry of Environment. It is responsible for enforcing environmental laws, regulations, and standards in Nigeria. NESREA's mandate includes ensuring that companies comply with environmental regulations and report their environmental performance. The agency has introduced various regulations targeting specific industries to mitigate environmental impact. The Financial Reporting Council of Nigeria (FRCN) oversees the preparation and publication of financial reports, including sustainability and environmental disclosures. While its primary focus is financial reporting, the FRCN encourages companies to integrate environmental information into their reports, aligning with global best practices. The SEC in Nigeria mandates listed companies to include sustainability information in their annual reports. This includes environmental, social, and governance (ESG) disclosures. The SEC's regulations aim to enhance transparency and ensure that investors have access to comprehensive information about a company's sustainability practices.

In recent years, there have been significant reforms and initiatives aimed at improving corporate environmental reporting in Nigeria. The Nigerian government, through the Federal Ministry of Environment, has developed a National Action Plan on Environmental Sustainability (Usman, 2019). This plan outlines strategies for promoting environmental sustainability across various sectors. It emphasizes the importance of corporate environmental reporting as a tool for accountability and transparency. The Central Bank of Nigeria, in collaboration with the Nigerian Bankers' Committee, introduced the Nigeria Sustainable Banking Principles (NSBP) in 2012. These principles provide guidelines for banks and financial institutions to integrate environmental and social considerations into their operations and reporting. The NSBP aims to promote sustainable development and encourage responsible environmental practices within the banking sector. Several Nigerian companies have voluntarily adopted international reporting frameworks such as the Global Reporting Initiative (GRI) Standards and the Carbon Disclosure Project (CDP). These frameworks provide comprehensive guidelines for reporting environmental performance, helping companies align with global best practices and meet stakeholder expectations.

Corporate environmental reporting in Nigeria is gradually evolving, driven by regulatory efforts, voluntary initiatives, and global trends. While significant progress has been made, challenges such as lack of mandatory regulations, limited awareness, and data reliability need to be addressed. Strengthening regulations, building capacity, providing incentives, and fostering collaboration are essential steps towards enhancing corporate environmental reporting in Nigeria. As the country continues to grapple with environmental challenges, robust and transparent reporting practices will play a crucial role in promoting sustainability and accountability in the corporate sector.

3. Theoretical framework

This study utilizes legitimacy and signalling theories to explain the relationship between corporate environmental reporting and the financial performance of listed manufacturing companies in Nigeria. Both theories offer valuable perspectives on how corporate disclosure of environmental practices and performance impacts stakeholder perceptions, trust, and ultimately, financial outcomes. Legitimacy theory posits that organizations are driven to act in ways that align with the expectations and norms of society in order to maintain their legitimacy. As Dowling and Pfeffer (1975) explain, legitimacy is crucial for an organization's survival because it establishes a social contract between the company and its stakeholders, where the company's actions are perceived as congruent with societal values. When a company operates in ways that the public perceives as responsible and ethical, it secures its place within the broader social framework. Conversely, failure to conform to these norms can lead to negative perceptions, loss of stakeholder trust, and a weakened financial position.

Corporate environmental reporting becomes a means for companies to demonstrate their commitment to environmental responsibility, which is a growing societal expectation globally. By disclosing information about environmental policies, costs, and performance, companies signal to their stakeholders including investors, customers, regulators, and the public that they are not only focused on financial profitability but also on sustainable practices and environmental stewardship (Cerciello et al., 2023). This aligns the company with broader societal values related to environmental sustainability, which enhances its legitimacy. For companies in Nigeria, where environmental concerns are increasingly gaining attention, corporate environmental reporting provides an avenue to build a positive image and foster goodwill among stakeholders. According to Dowling and Pfeffer (1975), firms, which often have significant environmental impacts, can use such reporting to show that they are addressing environmental challenges proactively. This helps them mitigate risks of reputational damage or regulatory penalties while also tapping into opportunities to improve stakeholder relationships as argued by legitimacy theory. The positive public image resulting from adherence to societal norms of environmental responsibility can attract socially conscious investors and customers, ultimately improving the company's financial performance (Le, 2023).

Signalling theory, introduced by Ross (1979), provides another perspective on how corporate environmental reporting influences financial performance. The theory suggests that organizations disclose information as a signal to the market, indicating their quality, competence, and long-term viability. According to Lee et al. (2023), companies with strong financial performance and sound operational strategies often provide more extensive and transparent disclosures, as they have a competitive advantage to highlight. By voluntarily disclosing environmental information, firms signal their commitment to sustainability and ethical business practices, distinguishing themselves from competitors that may not engage in similar levels of transparency.

In Nigeria, where there are no mandatory guidelines for environmental reporting, companies that voluntarily disclose their environmental performance, costs, and policies send a strong signal to investors and other stakeholders. This type of disclosure indicates that the company is forward-thinking and proactive in managing environmental risks, which are increasingly seen as critical to long-term financial success. For instance, by sharing data on emissions reductions, waste management, or sustainable resource use, a company demonstrates its dedication to minimizing environmental impact, thus reinforcing perceptions of reliability and operational excellence. This signalling effect is particularly important in attracting investors who are prioritizing environmental, social, and governance (ESG) factors in their decision-making processes (Khamisu et al., 2024). Companies that disclose robust environmental information are more likely to attract ESG-focused investors who are interested in long-term sustainability rather than short-term gains. Additionally, companies that can signal environmental responsibility may find it easier to access capital, reduce their cost of debt, and build stronger partnerships with environmentally conscious suppliers and clients (Gao & Wan, 2023). Thus, signalling theory explains how environmental reporting not only enhances a company's reputation but also contributes to financial gains through better stakeholder relations and investor confidence.

Both Legitimacy and signalling theories complement each other in explaining how environmental reporting can enhance financial performance. Legitimacy theory focuses on aligning company actions with societal expectations to maintain public trust and secure a favorable position in the market. Signalling theory, on the other hand, emphasizes how companies can use voluntary disclosure of environmental information to differentiate themselves from competitors and attract stakeholders who value sustainability. In the Nigerian manufacturing sector, where companies face increasing pressure to demonstrate corporate social responsibility, both theories underscore the importance of environmental reporting as a tool for building stakeholder trust and securing financial advantages. By demonstrating compliance with societal norms and signalling strong environmental performance, companies can enhance their legitimacy and stand out in the market, thereby improving their overall financial outcomes.

4. Empirical Literature review and hypotheses development

4.1 Environmental cost reporting and firm performance

The significance of environmental cost reporting in relation to firm performance has garnered increasing attention in recent years, as evidenced by various studies (Zhao et al., 2022; Abdullahi and Muhammed, 2023; Echobu and Ikechukwu, 2023; Olabisi et al., 2022; Duffin, 2023). These studies underscore the intricate and often context-dependent nature of this relationship, highlighting that while environmental costs can drive innovation and improve operational efficiency, their influence on financial metrics like market valuation and shareholder returns is more variable. This variation is particularly pronounced across different sectors, ownership structures, and regulatory environments, emphasizing the need for comprehensive and transparent environmental cost reporting.

Research by Al-Waeli et al. (2022), Ifada and Saleh (2022), Wang et al. (2023), and Ifada and Jaffar (2023) has consistently demonstrated a positive and significant relationship between environmental cost reporting and firm performance. These studies argue that firms that actively disclose their environmental costs tend to experience improved financial outcomes, largely due to enhanced stakeholder trust, better risk management, and a stronger reputation for sustainability. As sustainability becomes an increasingly critical factor in investment and consumption decisions, environmental cost reporting emerges as a vital tool for firms to communicate their commitment to responsible business practices. Moreover, transparent reporting of environmental costs plays a pivotal role in promoting **corporate accountability** and **transparency,** which are crucial for satisfying the growing expectations of stakeholders such as investors, customers, and regulatory bodies. These stakeholders are increasingly focused on sustainability and are more likely to engage with firms that demonstrate a clear commitment to environmental stewardship. By openly disclosing environmental expenditures, firms not only meet regulatory requirements but also strengthen their credibility and build trust with both the public and the investment community. For instance, environmentally conscious investors are more likely to support companies with transparent environmental practices, while customers may favour products from companies that demonstrate a commitment to reducing their environmental impact.

Environmental cost reporting also provides internal benefits to companies. It can act as a **strategic tool** to identify areas for efficiency improvements, leading to cost savings and fostering innovation, especially in the development of cleaner technologies (Alabi et al, 2024). By closely monitoring and reporting environmental costs, companies may uncover opportunities to optimize resource use, reduce waste, and lower emissions, all of which can improve operational efficiency and contribute to long-term sustainability. This reporting can also encourage firms to integrate sustainability into their core business strategies, aligning environmental objectives with financial goals. Such integration can enhance the firm's **competitiveness**, particularly in markets where environmental responsibility is increasingly valued by consumers and investors alike.

The relationship between environmental cost reporting and financial performance is further influenced by **sectoral and structural differences**. Prior studies have predominantly focused on specific industries such as oil and gas, consumer goods, and industrial goods, where the environmental impact is more direct and measurable. However, this study seeks to broaden the scope by examining the relationship between environmental cost reporting and financial performance across different sectors within the manufacturing industry in Nigeria. Manufacturing companies often have diverse environmental footprints depending on the nature of their operations, and a cross-sectoral analysis will provide a more comprehensive understanding of how environmental cost reporting influences financial outcomes in different contexts.

Given the evidence from previous studies and the growing importance of environmental accountability, this study hypothesizes that environmental cost reporting plays a significant role in shaping the financial performance of manufacturing companies in Nigeria. Transparent and comprehensive reporting not only enhances corporate accountability and operational efficiency but also serves as a strategic tool for navigating the complexities of sectoral differences and ensuring long-term competitiveness. **Based on the above, the study hypothesises that:**

H1: Environmental cost reporting has no significant impact on the performance of listed manufacturing companies in Nigeria.

4.2 Environmental policy reporting and firm performance

The disclosure of environmental policies has the potential to significantly influence the performance of firms, as demonstrated by recent studies (Dagestani and Qing, 2022; Pulino et al., 2022; Ding et al., 2022; Lin Qamruzzaman, 2023, Hoang, 2024 and Waheed et al., 2024). These studies suggest that when firms transparently communicate their environmental policies, they signal a commitment to sustainability and responsible environmental management. This form of disclosure provides key stakeholders such as regulators, investors, customers, the local community, and the general public with critical insights into the firm's environmental strategy, objectives, and actions. By openly sharing their policies, companies demonstrate an awareness of environmental risks and opportunities, along with a proactive approach to mitigating those risks and capitalizing on sustainability opportunities.

The benefits of environmental policy disclosure extend beyond simple compliance with regulations (Waheed et al., 2024). Transparency in this area fosters trust and credibility with stakeholders, helping firms build stronger relationships with key groups. This trust can lead to enhanced reputational benefits, which are crucial in today’s business environment where sustainability is an increasingly important criterion for evaluating corporate performance. For example, environmentally conscious customers may be more likely to support companies that actively disclose their environmental policies, while investors may view such firms as lower-risk and more aligned with long-term sustainable growth.

Moreover, firms that disclose their environmental policies can better position themselves to attract **socially responsible investors (SRIs)** and access **green financing opportunities (**Daugaard et al., 2024). SRIs are increasingly prioritizing companies that demonstrate a strong commitment to environmental stewardship, and by providing clear and detailed information on their environmental policies, firms can signal their alignment with global sustainability goals. This can result in more favourable financing terms, reduced capital costs, and improved access to capital markets that reward environmental responsibility. Additionally, firms that openly disclose their environmental policies are often better equipped to comply with evolving regulatory frameworks, which can further enhance their competitiveness in both domestic and international markets (Hoang, 2024).

Furthermore, environmental policy disclosure can help companies differentiate themselves in competitive markets. In industries where consumers and business partners are becoming increasingly environmentally conscious, having well-articulated and transparent environmental policies can serve as a competitive advantage. Companies that take the lead in disclosing their environmental policies demonstrate foresight and strategic thinking, which can positively influence their market positioning, brand image, and customer loyalty.

Despite the growing recognition of these benefits, the relationship between environmental policy disclosure and firm financial performance remains underexplored in the Nigerian context. While significant research has been conducted in other countries, no study to the best of the researcher's knowledge has specifically examined this relationship within Nigeria's manufacturing sector. This presents a critical gap in the literature, given the unique regulatory, economic, and environmental challenges faced by Nigerian companies. Understanding how the disclosure of environmental policies influences financial performance in this context could provide valuable insights for both academics and practitioners. By addressing this gap, the current study seeks to explore whether environmental policy reporting can influence the financial performance of listed manufacturing companies in Nigeria. Given the importance of environmental transparency for stakeholder relations, regulatory compliance, and competitive differentiation, this study aims to shed light on whether such disclosures translate into tangible financial benefits for Nigerian firms. **Based on the above, the study hypothesises that:**

H2: Environmental policies reporting has no significant influence on the performance of listed manufacturing companies in Nigeria.

4.3 Environmental performance reporting and firm performance

Environmental performance refers to a company's ability to effectively manage and minimize its environmental impact. This concept encompasses the assessment of a company's operations, products, and services, particularly in how they align with environmental objectives and comply with relevant regulations and standards. As a key pillar of corporate sustainability and corporate social responsibility (CSR), environmental performance is integral to how companies demonstrate their commitment to reducing their environmental footprint and contributing to the broader goals of sustainability (Yusuf, 2023). Environmental performance reporting, which involves the transparent disclosure of environmental impacts and achievements, plays a vital role in this process. By offering insight into a company's environmental efforts, it enhances stakeholder confidence and drives accountability (Agyemang et al., 2024).

Prioritising **environmental performance reporting** can significantly influence a firm's overall performance. Studies suggest that such transparency helps build stakeholder trust, which is increasingly critical in today's market where consumers, investors, and regulators expect companies to act responsibly in relation to the environment (Abgineh et al., 2023 and Zhou et al., 2024). By providing detailed reports on environmental metrics, companies can signal to stakeholders that they are committed to minimizing environmental harm and operating sustainably. According to Zhou et al. (2024), this transparency fosters stronger relationships with investors who are concerned with environmental, social, and governance (ESG) factors, thereby improving a company's reputation and potentially attracting environmentally conscious investors. Additionally, it helps strengthen relationships with customers, regulators, and local communities by demonstrating that the firm is serious about reducing its environmental footprint.

Beyond enhancing stakeholder trust, environmental performance reporting can drive **internal improvements** within a company. By publicly disclosing key environmental targets and metrics, companies are encouraged to adopt more rigorous environmental management systems and sustainable practices. These initiatives may include investing in eco-friendly technologies, improving waste management, reducing carbon emissions, and optimizing resource use. In turn, these improvements lead to **operational efficiencies**, including reduced energy consumption, lower production costs, and minimized regulatory penalties. Moreover, focusing on sustainability can open avenues for **innovation**, encouraging firms to develop new products and services that meet rising consumer demand for environmentally friendly alternatives. These outcomes can enhance a company's financial performance while also securing its competitive edge in the market.

The potential positive impact of environmental performance reporting is not only supported by the theoretical foundations of corporate sustainability but also by empirical studies. For instance, research by Digdowiseiso et al. (2022), Pulino et al. (2022), and Nur and Panggabean (2023), Carchano et al. (2024), all examine the relationship between environmental performance reporting and financial outcomes, although their findings vary. Some studies affirm that companies with robust environmental performance reporting tend to experience better financial outcomes due to enhanced reputational benefits and operational efficiencies. Others, however, highlight the **mixed findings** in different contexts, suggesting that sectoral differences, regulatory environments, and the specific nature of the environmental activities undertaken by firms can all influence the strength of this relationship.

These mixed findings point to the complexity of the relationship between environmental performance reporting and firm performance. While the benefits of transparency and proactive environmental management are clear, the degree to which these factors influence financial performance may depend on numerous variables, including the industry in which a firm operates, the stringency of environmental regulations, and the expectations of its stakeholders. In sectors where environmental impact is more pronounced, such as manufacturing, companies may see greater financial benefits from rigorous environmental performance reporting than firms in less resource-intensive industries.

In light of these observations, the current study seeks to explore the relationship between **environmental performance reporting** and **firm financial performance** within the context of listed manufacturing companies in Nigeria. Given the manufacturing sector's significant environmental footprint, this study aims to determine whether transparency in reporting environmental performance can positively influence the financial outcomes of these firms. **Based on the above, the study hypothesises that:**

H3: There is no significant effect of environmental performance reporting on the performance of listed manufacturing companies in Nigeria.

5. Research design

The study adopted an *expo facto* research design, employing content analysis to extract data from the annual reports and accounts of listed manufacturing companies in Nigeria. This methodology was chosen to assess the impact of corporate environmental reporting practices on company performance. The *expo facto* research design was preferred due to its quasi-experimental nature, dealing with pre-existing data that cannot be manipulated or controlled by the researcher.

5.1 Population of the study

The study focused on a population comprising seventy-six (76) listed manufacturing companies on the floor of Nigerian Exchange Group as of December 2022. The aforementioned companies encompass a total of seven (7) distinct sectors, comprising construction/real estate, consumer goods, healthcare, industrial goods, natural resources, oil and gas, and conglomerate sectors.

5.2 Sample size and sampling techniques

Utilizing the Krejcie and Morgan (1970) table for sample size determination, a total of sixty-four (64) companies were selected for the study. The process of sample selection encompassed the application of both stratified sampling and random sampling methodologies. This involved the segmentation of the various sectors' populations into distinct strata, with the sample size being determined in accordance with specified proportions. Consequently, companies were selected at random from each sector. In order to establish a well-rounded panel model, fifty-two (52) companies with comprehensive data spanning the period from 2016 to 2022 were incorporated in the research.

Table 5.1: Sample size and sampling technique

S/N	Sector (Stratum)	Population	Krejcie and Morgan	Sample Size
1	Construction/Real estate	**9**	**9/76*64 = 8**	**6**
2	Consumer goods	**21**	**21/76*64 = 17**	**14**
3	Health care	**10**	**10/76*64 = 8**	**8**
4	Industrial goods	**14**	**14/76*64 = 12**	**8**
5	Natural resources	**4**	**4/76*64 = 4**	**4**
6	Oil and gas	**12**	**12/76*64 = 10**	**8**
7	Conglomerates	**6**	**6/76*64 = 5**	**4**
Total		**76**	**64**	**52**

Source: Researcher's Computation (2024)

5.3 Definition and measurement of variables

This study incorporated three variables: the dependent variable, independent variables, and a control variable. Table 5.2. shows the measurement model of the three variables used in the study.

Table 5.2: Measurement of variable

Variable	Measurement	Source	A-Prior expectation
Dependent			
Performance	Measured using Tobin's Q) Q = Market Value/Asset Value		
Independent			
Environmental policies disclosure	Dichotomous scores: The value is set to 1 if the company discloses, and 0 otherwise (See Appendix for Checklist)	Odoemelam and Okafor, (2018); Usman, 2019; NSE (2019)	+
Environmental cost disclosure	Dichotomous scores: The value is set to 1 if the company discloses, and 0 otherwise (See Appendix for Checklist)	Odoemelam and Okafor, (2018); Usman, 2019; NSE (2019)	+
Environmental performance disclosure	Dichotomous scores: The value is set to 1 if the company discloses, and 0 otherwise (See Appendix for Checklist)	Odoemelam and Okafor, (2018); Usman, 2019; NSE (2019)	+
Control			
Firm size	Total assets of the firm		

Source: Field Survey (2024)

6. Empirical results and discussion

6.1 Descriptive statistics of variables

Table 6.1 presents the descriptive statistics of the variables analyzed within this investigation. In terms of firm performance, quantified through Tobin's Q, the average figure stands at 1.052, accompanied by a standard deviation of 1.485. This implies that, typically, Tobin's Q for the manufacturing firms included in the sample amounts to 1.052. The proximity between the mean and standard deviation suggests a relatively limited range of the firm performance metric across the companies surveyed. The minimum and maximum values of 0.054 and 11.175, respectively, represent the lowest and highest Tobin's Q observations.

Table 6.1: Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
TBQ	364	1.052	1.485	.054	11.175
EPOR	364	.217	.19	0	1
ECR	364	.176	.168	0	1
EPER	364	.204	.172	0	1
FSIZE (Millions)	364	104,815	238,451	321	2,022,451

Source: Author's Computation (2024)

Environmental policies reporting is depicted as a ratio that falls within the spectrum of 0 to 1 or in percentage form. The mean value of 0.217, translating to 21.7%, signifies the average environmental reporting policies observed throughout the study period. With a standard deviation of 0.217, there exists minimal variability in the disclosure of environmental policies among the manufacturing firms included in the sample. The spectrum ranges from 0% to 75%, illustrating a wide array of disclosure activities. In relation to the disclosure of environmental costs, the mean value of 0.176 indicates that, on average, firms disclose 17.6% of their environmental cost data. The standard deviation of 0.168 indicates similar disclosure patterns among the firms, with a range that spans from 0% to 50%. The examination also delves into the disclosure of environmental performance, revealing a mean value of 0.204, which equates to an average disclosure rate of 20.4%. The standard deviation of 0.172 suggests a moderate level of variance in environmental cost disclosure, with the range stretching from 0% to 77.8%, showcasing diverse reporting strategies. Concerning firm size, as measured by total assets, it varies from N321 million to N2.02 trillion in Nigerian Naira. The mean value of N104.8 million indicates that, on average, a listed company in Nigeria holds assets valued at N104.8 million Naira. The significant diversity in total assets among the firms in the study sample is mirrored by the standard deviation of N238.4 million.

6.2 Preliminary diagnostic test

The preliminary tests conducted encompassed assessments for multicollinearity, auto and serial correlation, heteroskedasticity, normality, and specification test.

6.3 Correlation analysis

The utilisation of the Pearson Product Moment Correlation aimed at exploring the bivariate connections between the variables within the framework, ensuring compliance with the linearity assumption of normality in the frameworks. The correlation matrix displayed in Table 4.2 delineates the characteristics of the associations amidst the reliant and autonomous variables of the investigation, alongside the connections among the autonomous variables. An outline of the relationships among the variables under study is depicted in the subsequent Table 4.2.

Table 6.2 Correlation Matrix

Variables	TBQ	EPOR	ECR	EPER	SIZE
TBQ	1.000				
EPOD	-0.277	1.000			
ECD	-0.235	0.861	1.000		
EPED	0.351	-0.933	-0.847	1.000	
PPED	0.314	-0.847	-0.932	0.873	
SIZE	-0.221	0.503	0.360	-0.475	1.000

Source: Author's Computation (2024)

From table 4.2, it can be observed that the correlation coefficient ranges from 1.0 to -1.0. An exact coefficient of 1.0 within the matrix (diagonal) indicates a robust positive linear relationship within a variable, whereas -1.0 denotes a strong negative association. When the correlation coefficient falls between 1.0 and -1.0, it suggests a relationship of moderate or weak strength. More specifically, a value of $r > 0$ signifies a positive relationship, $r < 0$ indicates a negative relationship, and $r = 0$ implies no relationship. The general principle for interpreting the correlation matrix is as follows: 1-10% represents a very weak relationship, 11-29% indicates a weak relationship, 30-60% suggests a moderate relationship and 61% and above signifies a strong relationship. Concerning firm performance, there exists a negative correlation between environmental policy disclosure and Tobin's Q, with a weak correlation coefficient of 0.277. Similarly, the correlation between environmental cost disclosure and Tobin's Q is also negative and weak, with a correlation coefficient of -0.235.

Nevertheless, the disclosure of environmental performance highlights a positive and moderately robust association with Tobin's Q, boasting a correlation coefficient of 0.351. Conversely, the size of the organization demonstrates a negative and feeble correlation with Tobin's Q, possessing a correlation coefficient of -0.221. When examining the correlation among the independent variables, it is crucial to recognize that a correlation coefficient surpassing 0.80 between two independent variables is deemed excessive (Gujarati, 2004). A majority of the correlation coefficients among independent variables in the dataset exceed 0.80, suggesting a potential presence of detrimental multicollinearity.

6.4 Hausman specification test

Following a thorough evaluation of the aforementioned models, the model selection process is accompanied by Hausman's test. In this test, the study posited a fixed effect on TBQ, aiming to ascertain the suitability of either the random or fixed model. The interpretation of the model, as depicted in the table below, relies on the determination of the appropriate model guided by Hausman's test results presented in Table 4.4 for the TBQ model.

Table 6.3: Hausman's specification test on TBQ Model

Test: Ho: difference in coefficients not systematic		
Chi-square test value	=	132.43
P-value	=	0. 000

Source: Author's Computation (2024)

As illustrated in table 4.3 provided, the chi-square value equals 132.43, resulting in a probability value of 0.006. This observation presents compelling evidence for the rejection of the null hypothesis, which posited the appropriateness of the random effect model. The statistical significance is clearly evident at a significance level of 5%, as the probability value falls below the established threshold. In accordance with conventional principles of hypothesis testing, the dismissal of the null hypothesis provides credence to the validity of the alternative hypothesis. Consequently, the fixed effect TBQ model is validated.

6.5 Auto correlation and serial correlation

It is crucial for OLS or panel regression results to be credible and valuable for reporting that the model is free from auto/serial correlation, the study conducted the Woodridge auto correlation test.

Table 6.5 Auto and serial correlation test

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F1, 44) = 57.095
Prob> F = 0.0000

Source: Author's Computation (2024)

The outcomes of the examination reveal the existence of both auto and serial correlation, which is supported by the statistically significant chi-square probability at the 1% level of significance. In order to address these challenges, the research employed Panel Corrected Standard Error (PCSE) for Fixed Effect. PCSE tackles autocorrelation through the maintenance of observation weighting, alongside the adjustment of standard errors utilizing a sandwich estimator to consider cross-sectional dependency (Mantobaye et al., 2017).

6.6 Normality distribution of the residuals

Another critical assumption in linear regression is the normal distribution of data, which is essential for conducting parametric test analysis. However, it is argued that the normality test should be performed on the residuals of the model rather than the data itself, with the type of parametric analysis determined by the dependent variable (Ghasemi & Zahediasl, 2012). As a result, a Shapiro-Wilk normality test was conducted on the residuals.

Table 6.6 Shapiro-Wilk W test for Normality

Variable	Obs	W	V	Z	Prob>z
res	364	0.8959	26.076	7.721	0.000

Source: Author's Computation (2024)

6.7 Heteroskedasticity test

This examination aimed to determine if there is constant variability in the error terms. The presence of heteroscedasticity contradicts the assumption of homoscedasticity and may lead to inaccurate conclusions. The Modified Group Wise test was employed to assess heteroskedasticity in this analysis.

Table 6.7 Heteroskedasticity test on TBQ Model

Modified Wald Test for Groupwise Heteroskedasticity In Fixed Effect The Regression Model
Ho: constant variance
Variables: fitted values of tbq
chi2(14) = 6.0e+05
Prob> chi2 = 0.0000

Source: Author's Computation (2024)

The findings from the examination of the TBQ model suggest the existence of heteroskedasticity, as indicated by the statistically significant chi-square probability of 0.0000 at the 1% level of significance, implying the lack of homoskedasticity in the model. Consequently, it may not be appropriate to utilize Fixed Effect regression in this particular research. To summarize, a reevaluation of the fixed effect TBQ model is necessary based on the outcomes of Hausman's test. Nevertheless, due to the presence of heteroskedasticity in the TBQ model, the fixed effect model becomes unsuitable. In order to overcome the limitations of the Fixed Effect model in the context of heteroskedasticity, Panel Corrected Standard Error (PCSE) was adopted in this study. Consequently, following the recommendation of Gujarati and Porter (2017), the PCSE model was executed. Subsequent to this, the PCSE model is detailed and analyzed in the subsequent sections.

6.8 Restatement of hypotheses and discussion of findings

This section presents the result of the Panel Corrected Standard Error (PCSE) for Fixed Effect test to test hypotheses stated earlier in the study.

The summary of the PCSE regression results obtained from the TBQ model of the study is presented in Table 6.8:

Table 6.8: Panel corrected standard error model regression result for TBQ

Variables	Coefficient	Std. Err	Z-values	Sig
CONSTANT	4.290677	.9492432	4.02	0.000
EPOD	.9194775	.3826111	2.40	0.016
ECD	6.008976	1.782201	3.37	0.001
EPED	1.936827	.4726561	4.10	0.000
PPED	3.094413	1.506067	2.05	0.040
SIZE	-.0593475	.0326412	-1.82	0.069
R^2	0.1726			
Wald chi^2	37.06			
Prob Wald chi^2	0.0000			
No of Observation	364			
Panels:	Correlated(balanced)			
Correlation:	No autocorrelation			

Source: Author's Computation (2024)

6.9 Environmental policy reporting and firm performance

The results of this study demonstrate that environmental policy disclosure has a significant positive impact on the performance of manufacturing firms listed in Nigeria, as indicated by a Z-value of 2.40, a coefficient value of 0.919, and a p-value of 0.016 at the 5% significance level. This finding can be explained through the lens of legitimacy theory, which posits that organizations seek to align their operations with societal norms and expectations to maintain their legitimacy. By disclosing environmental policies, firms signal their commitment to sustainability and environmental responsibility, thereby enhancing their legitimacy in the eyes of stakeholders. This enhanced legitimacy, in turn, leads to improved performance, as it strengthens the company's reputation, attracts investors, and fosters trust among stakeholders.

Additionally, the results align with stakeholder theory, which emphasizes the importance of addressing the needs and interests of all stakeholders, including investors, customers, employees, and the broader community. The positive correlation between environmental policy disclosure and firm performance suggests that transparent communication of such policies to stakeholders is valued by the market, leading to an increase in the average stock price of the company. This reflects the market's recognition of the benefits associated with sustainable business practices, such as reputation enhancement, access to new markets and capital, and competitive advantage.

Furthermore, the research provides evidence to refute the alternative hypothesis that suggests no significant relationship between environmental policy disclosure and firm performance, as the p-value does not exceed the 5% significance level. These findings are consistent with the work of Dagestani and Qing (2022), Ding et al. (2022) Pulino et al. (2023), Hoang (2024) and Carchano et al. (2024), who also observed a positive and significant impact of disclosing information on compliance with corporate environmental regulations on financial performance metrics.

6.10 Environmental cost reporting and firm performance

The correlation between reporting environmental costs and the performance of listed manufacturing firms reveals a positive relationship, as evidenced by the statistically significant coefficient of 6.008 at the 1% level (p-value of 0.001). This indicates that increased transparency in disclosing environmental costs is associated with enhanced firm performance. This finding can be understood through the lens of legitimacy theory and stakeholder theory. According to legitimacy theory, companies seek to align their operations with societal expectations, and by reporting environmental costs, manufacturing firms demonstrate their commitment to addressing environmental concerns. This alignment enhances their legitimacy in the eyes of stakeholders, leading to improved performance. Stakeholder theory further supports this by emphasizing that companies are accountable to a broad range of stakeholders, including investors, society, and the local community.

By meeting the information needs of these stakeholders through environmental cost disclosure, firms can boost their overall performance. The study's results, which align with the findings of Ifada and Saleh (2022), Ifada and Jaffar (2023), Zhao et al. (2022), Abdullahi and Muhammed, (2023), Echobu and Ikechukwu (2023), Olabisi et al. (2022), Duffin (2023) and Wang et al. (2023), underscore the significant influence of environmental cost disclosure on financial performance, particularly in areas such as waste management and employee health and safety. The substantial evidence provided by the p-value above 5% refutes the alternative hypothesis, reinforcing the critical role of environmental cost disclosure in the performance of listed manufacturing firms in Nigeria.

6.11 Environmental performance reporting and firm performance

The Z-value of 4.1, a coefficient value of 1.93, and a p-value of 0.0000 for environmental performance disclosure indicate a statistically significant positive relationship with firm performance among publicly traded manufacturing companies in Nigeria, significant at the 1% level. This finding aligns with both legitimacy theory and stakeholder theory, suggesting that higher levels of environmental performance disclosure enhance firm performance. According to legitimacy theory, firms that disclose their environmental performance effectively signal to stakeholders that they are meeting societal expectations for sustainability, thereby gaining legitimacy and support. Stakeholder theory further supports this, positing that such disclosures foster trust and satisfaction among stakeholders, which can lead to increased support and ultimately, improved financial outcomes, such as higher share prices.

The evidence provided by this study, with its p-value far below the 5% threshold, strongly supports rejecting the null hypothesis and confirms a substantial correlation between environmental performance disclosure and firm performance. These findings are consistent with stakeholder theory and the study of Abgineh et al. (2023), Yusuf (2023), Zhou et al. (2024) and Carchano et al. (2024), which emphasizes the importance of environmental reporting in securing stakeholder backing. However, they contrast with the results of Pulino et al. (2022) and Nur and Panggabean (2023), who argued that environmental reporting does not significantly impact financial performance.

6.12 Policy implications of the findings

The study findings shed light on the influence of environmental disclosure practices on firm performance, offering valuable insights for policy implications. The results underscore the economic significance of integrating corporate environmental disclosure practices into corporate strategy. Adopting a culture of environmental disclosure practices represents a pivotal step towards sustainable development, resource conservation, and legitimizing firm operations by fostering beneficial relationships with stakeholders. Manufacturing firms are encouraged to engage in environmental disclosure practices to enhance their reputation among investors and stakeholders, ensuring transparency and accountability. Moreover, the study highlights that environmental disclosure practices contribute to firms' performance improvement, emphasizing the importance of such reporting practices. Enhanced disclosure aids stakeholders in making informed decisions, ultimately bolstering market share. However, the extent of disclosure within Nigeria's manufacturing sector is comparatively low compared to other countries, resulting in limited impact. The study suggests that manufacturing firms in Nigeria should increase their disclosure of environmental information to enable stakeholders to make well-informed decisions, thereby enhancing overall performance.

7. Summary and conclusion

The study empirically examined the relationship between corporate environmental reporting practices and firm performance in Nigerian manufacturing firms. The findings indicate a significant positive correlation between the proxies of environmental reporting practices such as disclosures on environmental policies, costs, and performance metrics and the overall performance of these firms. This research contributes to the existing literature by providing empirical evidence supporting the notion that corporate environmental reporting can positively impact firm performance. It also offers practical insights for Nigerian manufacturing firms, suggesting that enhancing transparency in environmental disclosures can lead to improved stakeholder relationships and competitive advantages.

The implications of these findings are multifaceted. For manufacturing firms in Nigeria, the study underscores the importance of environmental reporting as a strategic tool for achieving better performance outcomes. By providing comprehensive and transparent environmental information, firms can not only meet regulatory requirements but also attract investors, customers, and other stakeholders who prioritize sustainability. This, in turn, can lead to enhanced market reputation, increased customer loyalty, and potentially higher financial returns.

Furthermore, the study suggests that regulatory bodies and industry associations should encourage or mandate comprehensive environmental reporting standards. This could help create a level playing field and ensure that all firms adhere to minimum disclosure standards, thereby enhancing overall industry transparency and accountability. While the study provides valuable insights, it is not without limitations. The research primarily focuses on Nigerian manufacturing firms, which may limit the generalizability of the findings to other sectors or regions. Additionally, the study relies on proxies for environmental reporting and firm performance, which may not capture all aspects of these constructs. There is also the potential for self-selection bias, as firms that are already performing well may be more likely to invest in robust environmental reporting practices.

Future research could address these limitations by expanding the scope of the study to include firms from different industries and regions, thereby enhancing the generalizability of the findings. Additionally, longitudinal studies could provide deeper insights into the long-term impact of environmental reporting on firm performance. Researchers could also explore the specific mechanisms through which environmental reporting affects performance, such as through improved operational efficiency or enhanced stakeholder trust. Moreover, future studies could investigate the role of different types of environmental disclosures (e.g., qualitative vs. quantitative, mandatory vs. voluntary) and their respective impacts on firm performance. Finally, it would be valuable to explore the perspectives of different stakeholders, including investors, customers, and regulatory bodies, to understand how they perceive and respond to corporate environmental reporting practices.

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Appendix

Disclosure checklist for corporate environmental disclosure practices

	Corporate environmental disclosure practices	**Score**
A	**Environmental policies disclosure**	
1	Actual statement of Environmental Policies	
2	Departments or Positions for environmental and/or safety Management	
3	Environmental impact studies	
4	Health and safety policies	
5	Discussion of environmental regulations and requirements	
6	Compliance with pollution laws and regulations	
7	Compliance with health and safety standards and regulations	
8	Compliance status with environmental and/or health and safety such as ISO, EMS, BS OHSAS and PAS	
B	**Environmental cost**	
1	Disclosure of environmental cost	
2	Past, current or future estimates of capital and operating expenditure for environmental protection or remediation	
3	Research and development expenditure for pollution abatement	
4	Financing of pollution control equipment and facilities	
C	**Environmental performance**	
1	Environmental investment	
2	Environmental investment appraisal	
3	Conservation of natural resources	
4	Environmental contingent liabilities and provisions	
5	Product stewardship (product's impact on the environment)	
D	**Product and process-related environmental issues**	
1	Pollution emissions and effluent discharge	
2	Waste management	
3	Packaging	
4	Recycling initiatives	
5	Products and product development/ innovation	
6	Efficient use of materials	
7	Energy efficiency of products/ energy consumption	
8	Water consumption	
9	Product Safety	