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FIRM PROFITABILITY AND ENVIRONMENTAL DISCLOSURE OF LISTED MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT

The study examined the effect of firm profitability on environmental disclosure of listed manufacturing firms in Nigeria. The specific objective was to examine the effect of return on asset on Environmental Disclosure Index. The study adopted ex-post facto research design. The population comprised 42 listed manufacturing firms in Nigeria. A sample size of 30 was chosen using purposive sampling technique. The study collected secondary data from the firms' annual reports over a thirteen year period from 2012-2024. Descriptive test was used to summarise the data while panel least square regression was used to test the hypotheses. It was found that firm profitability has a significant and positive effect on environmental disclosure of manufacturing firms in Nigeria ($\beta = 0.6101$, $p = 0.0010$). In conclusion, structural attribute of firms particularly those tied to performance carry meaningful implications for how firms respond to environmental concerns. The study recommends that managing directors and internal sustainability teams of profitable manufacturing firms should institutionalize environmental reporting as part of their corporate performance communication, leveraging available profits to invest in structured disclosure systems and third-party assurance mechanisms that enhance credibility.

Key words: *Environmental Disclosure, Environmental Disclosure Index, Firm Profitability, Return on Asset.*

INTRODUCTION

In recent decades, the discourse on sustainability and corporate environmental accountability has transitioned from being a peripheral matter to a central concern in global corporate governance and strategy (Amahalu, 2020). Growing awareness of environmental degradation, climate change, and the depletion of natural resources has prompted governments, investors, and consumers to demand increased transparency from businesses regarding their environmental practices (Haruna, Shuaibu & Garba, 2024). Against this backdrop, environmental disclosure has emerged as a critical tool through which firms communicate their environmental policies, practices, and performance to stakeholders (Obiora, Nworie &

Onyebuchi, 2024). In developing economies such as Nigeria, the manufacturing sector's rapid industrialization has exacerbated ecological challenges, including high emissions, excessive energy consumption, and significant waste generation. Understanding the extent and drivers of environmental disclosure in this sector has therefore become increasingly important. Environmental disclosure is now widely recognized as more than a compliance requirement; it is a strategic instrument for demonstrating a company's commitment to sustainable development and corporate social responsibility (Nwankwoh & Oiji-Okafor, 2023). Such disclosures not only enhance corporate image but also reduce information asymmetry, improve investor confidence, and create competitive advantage. From a governance perspective, transparency in environmental reporting can help firms maintain legitimacy in the eyes of stakeholders while also fulfilling the growing expectations of regulators, NGOs, and the investing public (Nnamchi & Okoye, 2025). Globally, the practice is often encouraged, if not mandated, through frameworks such as the Global Reporting Initiative (GRI) and the United Nations Sustainable Development Goals (SDGs). In Nigeria, regulatory bodies such as the Financial Reporting Council (FRC) have begun to issue guidelines to promote sustainability and environmental reporting (Umukoro & Omozue, 2024). However, the adoption rate in the Nigerian manufacturing sector remains inconsistent, with many listed firms providing only limited and selective disclosures despite the sector's substantial environmental footprint.

The Nigerian manufacturing industry is a cornerstone of the nation's economy, contributing significantly to gross domestic product (GDP), employment creation, and industrial output. However, its operations have considerable environmental implications, making it one of the most scrutinized sectors from an ecological standpoint (Sanni & Usman, 2024). While developed countries have implemented mandatory environmental disclosure frameworks, Nigeria continues to rely largely on voluntary reporting, resulting in fragmented and inconsistent practices. Empirical evidence shows that only a few Nigerian manufacturing firms publish comprehensive environmental reports, and even fewer provide detailed, verifiable, and forward-looking disclosures (Stanley & Anthony, 2020; Sanni & Usman, 2024). This gap in disclosure practices raises important questions about what drives firms to engage in environmental transparency, with profitability emerging as a potentially influential factor. Profitability represents a firm's ability to generate earnings relative to its expenses and is often considered a key determinant of corporate behavior, including disclosure practices. From the resource availability perspective, more profitable firms may have the financial

capacity to invest in environmental initiatives and the reporting systems required to communicate these efforts effectively (Ali, Mouri & Thasinul, 2020). Profitability can also enhance a firm's willingness to disclose environmental information as part of a broader strategy to build legitimacy, attract investors, and strengthen brand reputation. On the other hand, some researchers argue that highly profitable firms may choose to limit disclosure to avoid attracting regulatory scrutiny or to maintain competitive advantages by not revealing certain operational details. This dual perspective underscores the complexity of the profitability–disclosure relationship, making it an important subject for empirical examination in contexts like Nigeria's manufacturing sector.

Firm attributes such as size, age, leverage, board composition, and profitability—have been extensively studied in relation to environmental disclosure, with mixed results. Regarding profitability specifically, prior research presents conflicting evidence. For instance, studies by Abubakar (2017) and Akbas (2014) found a positive relationship between profitability and environmental disclosure, suggesting that financially strong firms are more capable of meeting stakeholder demands for transparency. Conversely, other studies indicate that profitability has either a negative or insignificant effect, implying that the relationship is not straightforward and may be influenced by contextual factors such as regulatory environment, industry type, or stakeholder activism (Usman, 2024). This lack of consensus highlights the need for further investigation, particularly within Nigeria's listed manufacturing firms, where profitability levels vary widely and reporting requirements are still evolving.

Globally, profitability has been linked to enhanced disclosure through several theoretical lenses. Nworie, Cyril-Nwuche and Oduche (2024) argued that legitimacy theory posits that profitable firms have greater incentives to demonstrate their social and environmental responsibility to maintain their "license to operate." Stakeholder theory suggests that profitability increases a firm's capacity to address stakeholder concerns, which often includes environmental accountability. Resource-based theory emphasizes that profitability provides the resources—both financial and human—necessary to implement effective environmental management systems and produce comprehensive disclosures. However, these theoretical advantages may be offset by managerial discretion, competitive pressures, or a lack of enforcement mechanisms, especially in developing markets where environmental regulations are weakly enforced. In Nigeria's context, manufacturing firms face a complex operating environment characterized by fluctuating economic conditions, infrastructural deficits, and

regulatory gaps. This environment shapes both their profitability levels and their disclosure practices. For some firms, high profitability may lead to greater openness in reporting environmental performance, aiming to build investor confidence and attract international business partners familiar with global sustainability norms. For others, profitability may not translate into enhanced disclosure due to cost-cutting priorities, lack of awareness, or a perception that environmental reporting yields limited immediate returns.

The role of profitability in shaping environmental disclosure is further complicated by the interplay with other firm attributes. For example, larger profitable firms might face stronger stakeholder pressure to disclose environmental information than smaller profitable firms (Moruff, Salisu, Muhammed & Garba, 2021). Although numerous studies such as Okerekeoti (2022), Ikpor et al. (2022), Onyebuenyi and Ofoegbu (2022), Obiora et al. (2022), Oranefo (2022), Ezekwesili and Ezejiofor (2022), Alade and Odugbemi (2022), Bello and Ogungbenle (2022), Bala et al. (2022), Ponsian et al. (2021), Aris et al. (2021), Zayol et al. (2021), Onyali and Uchegbu (2021), Atoyebi and Okpe (2021), and Atang and Eyisi (2020) have examined the relationship between firm characteristics and sustainability or environmental disclosure, the existing literature reveals certain shortcomings. Many of these studies have considered profitability as one of several explanatory variables without isolating its specific dimension as measured by return on asset, thereby limiting clarity on the direct profitability–disclosure link. Furthermore, while some have analyzed environmental disclosure using general or broad sustainability reporting frameworks, few have adopted a focused measurement tool such as the Environmental Disclosure Index to assess disclosure depth and quality. Geographically, although several works have been conducted in Nigeria, there is a lack of concentrated empirical evidence within the manufacturing sector, which is both environmentally impactful and economically significant. Additionally, much of the prior research is based on shorter time spans or cross-sectional data, thereby constraining the ability to detect long-term patterns. The combination of these methodological and contextual gaps underscores the need for a longitudinal, sector-specific study that explicitly investigates the effect of return on asset on Environmental Disclosure Index among listed manufacturing firms in Nigeria, covering a longer period to yield more robust and industry-relevant hints.

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Objective

The main aim of the study is to examine the effect of firm profitability on environmental disclosure of listed manufacturing firms in Nigeria. The specific objective is stated below:

1. to evaluate the effect of return on asset on Environmental Disclosure Index of listed manufacturing firms in Nigeria.

LITERATURE REVIEW

Firm Profitability

Firm profitability refers to the ability of a business organization to generate a financial surplus from its operations after covering all the costs and expenses associated with producing and delivering its goods or services (Amahalu, 2020). It is the financial condition in which a company earns more revenue than the total outlay it incurs in running its activities. Profitability represents the extent to which a firm's operations and strategies translate into financial gain, and it is often seen as a measure of the company's economic success in relation to the resources it has employed (Nworie, Okafor & John-Akamelu, 2022). This concept captures the financial outcome of a firm's activities over a period of time (Obiora, Onuora & Ezeogidi, 2022). It expresses the surplus that remains when all expenditures, including production costs, administrative expenses, interest, and taxes, have been deducted from the firm's total revenue. Profitability is not merely about earning income; it reflects the efficiency and effectiveness with which a firm utilizes its assets, capital, and capabilities to secure earnings that exceed its operational obligations. It is therefore regarded as a sign of the firm's capacity to sustain its operations and reward its stakeholders over time (Okerekeoti, 2022).

Firm profitability also serves as an indicator of competitive strength within the business environment (Amahalu, 2020). A profitable firm demonstrates that its products or services are valued in the market, that its cost structures are well managed, and that it is able to command a market position strong enough to secure favorable returns. While profitability levels may fluctuate due to market conditions or strategic shifts, the concept itself remains tied to the enduring aim of business activity: producing a positive and sustainable financial outcome (Nworie, Okafor & John-Akamelu, 2022). In essence, firm profitability is the economic expression of business success, representing the surplus value created for owners and investors through the firm's operational and strategic endeavors.

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Return on Asset

Return on asset refers to a measure of how efficiently a company uses its total assets to generate earnings (Nworie & Mba, 2022). It expresses the relationship between the net income produced by the firm over a period and the value of the assets it has employed in its operations (Husna & Satria, 2019). This concept essentially quantifies the profitability of the assets themselves, showing the degree to which each unit of value invested in assets produces a return. It is a financial indicator that translates the broad idea of resource utilization into a concrete measure of performance. A high return on asset suggests that the company is making productive and efficient use of its property, equipment, cash, inventory, and other resources to generate profits. A lower value, on the other hand, implies that the firm's assets are not being converted into earnings as effectively. The term is used widely in financial analysis because it combines two fundamental aspects of business: profitability and resource investment.

Return on asset is meaningful because it ties profitability to the scale of resources under a company's control (Husna & Satria, 2019). Two firms may have similar net incomes, but the one generating those earnings with fewer or less valuable assets is considered more efficient in asset utilization. This ratio-like concept is applicable across industries, although the typical values may vary depending on the nature of the sector and its asset requirements. The definition of return on asset is therefore anchored in the relationship between profit generation and the resources employed to achieve it. It is not only a reflection of past performance but also an indicator of operational effectiveness that can inform strategic decisions (Nworie & Mba, 2022). By expressing profitability relative to total assets, it encapsulates a company's ability to convert investments in tangible and intangible property into measurable financial returns.

H_0: *Return on asset has no significant effect on environmental disclosure index of listed manufacturing firms in Nigeria.*

Environmental Disclosure

Environmental disclosure refers to the practice by which a company communicates information about the environmental aspects of its operations to external stakeholders (Obiora, Onuora & Ezeogidi, 2022). It is the formal presentation of details that describe how the organization's activities interact with, affect, or are influenced by the natural environment. This includes statements about policies, practices, initiatives, and measurable impacts

concerning areas such as emissions, resource consumption, waste management, biodiversity protection, and compliance with environmental laws (Nworie, Obi, Anaike, C., & Uchechukwu-Obi, 2022). At its essence, environmental disclosure is about providing a transparent account of the company's environmental footprint. It conveys the extent to which the organization accepts responsibility for its influence on ecological systems and communicates this understanding in an accessible form (Oranefo, 2022). Such disclosures may appear in annual reports, stand-alone sustainability reports, regulatory filings, or other publicly available documents. The content is often both qualitative and quantitative, ensuring that stakeholders can form a meaningful understanding of the company's environmental position (Ezekwesili & Ezejiofor, 2022).

This concept is not limited to legal requirements. Many organizations disclose environmental information voluntarily to demonstrate accountability and to strengthen their reputation with investors, customers, regulators, and the wider community. Through environmental disclosure, companies seek to present a clear narrative about their efforts to reduce harmful impacts and to align business activities with broader societal goals for sustainability (Bello & Ogungbenle, 2022). Environmental disclosure therefore acts as a bridge between a firm's internal environmental performance and the external world's perception of that performance. It reflects a willingness to be judged on environmental stewardship and to allow such judgments to influence the company's relationship with its stakeholders. The meaning of the concept lies in the idea of openness: providing honest, relevant, and timely information about how a company interacts with the environment, allowing others to assess both its present actions and its direction for the future.

Environmental Disclosure Index

Environmental disclosure index refers to a structured tool or measure used to quantify and evaluate the extent of environmental information that an organization makes publicly available (Singhania & Gandhi, 2015). It is a scoring or ranking system that reflects the breadth and depth of environmental disclosures found in company reports or other public communications. The index is typically based on a set of predetermined criteria that define what aspects of environmental performance or management should be disclosed. This concept transforms qualitative information into a comparable and standardized measure. By assigning values to the presence or absence of specific environmental details, the environmental disclosure index enables observers to compare companies or track changes over time. It represents an attempt to capture the completeness and transparency of environmental

reporting in a single, interpretable figure or score (Singh, Chakraborty, Roy & Tripathi, 2021). An environmental disclosure index has meaning beyond its numerical output. It embodies the idea that disclosure is not only about what is said but also about how fully and systematically the relevant information is presented. A higher index score suggests that a company has communicated more comprehensive details about its environmental impact and initiatives. A lower score indicates that the public record contains fewer or less detailed statements on environmental matters (Jaaffar, Alrazi, Ooi & Shamsuddin, 2019).

Theoretical Review

Legitimacy theory originated from the broader field of institutional and political theory, gaining prominence in academic discourse during the early 1980s (Nworie, Cyril-Nwuche & Oduche, 2024). The theory builds on the idea that organizations operate within a social contract with the communities in which they function, and their continued survival depends on adherence to the norms, values, and expectations of society. Early contributions to legitimacy theory can be traced to the works of Dowling and Pfeffer in 1975 (O'Donovan, 2000), who articulated that corporate legitimacy is a condition in which an organization's actions are perceived as desirable, proper, or appropriate within a socially constructed system of norms and beliefs. Over time, this perspective became a widely accepted lens for understanding why companies adopt certain practices and make specific disclosures, particularly in areas involving social and environmental accountability.

The main postulation of legitimacy theory is that an organization's ability to secure and maintain legitimacy depends on how well it aligns its actions and communications with societal expectations (Nworie, Cyril-Nwuche & Oduche, 2024). When a firm's activities are perceived to deviate from these expectations, its legitimacy may be threatened, prompting management to take steps to restore the balance. This often involves increased transparency, voluntary reporting, or initiatives that demonstrate compliance with prevailing values. The theory assumes that legitimacy is dynamic and can be gained, maintained, or lost depending on the firm's relationship with the public (Deegan, 2019). It also emphasizes that societal norms are not static; they evolve over time, meaning that organizations must continuously monitor and adapt their strategies to retain legitimacy. This theory is relevant to the study because sustainability reporting, particularly in relation to profitability and environmental disclosure, can be understood as a strategic response to societal pressures. Multinational corporations in Nigeria operate in an environment where stakeholders are increasingly

attentive to environmental and social performance alongside financial results. Legitimacy theory provides an explanatory foundation for why these corporations may choose to disclose sustainability information, even when such disclosure does not directly translate into immediate financial gains. By aligning their public reports with societal expectations, companies enhance their social standing and maintain the support necessary for long-term operation.

Empirical Review

Okerekeoti (2022) determined the effect of profitability on sustainability reporting of Nigerian multinational corporations. Covering the period from 2010 to 2020 and using inferential statistics, the study found that profitability had an insignificant effect on social sustainability reporting. Ikpor, Bracci, Kanu, Okezie, Mlanga, and Ogbaekirigwe (2022) contributed to sustainability reporting literature in emerging economies by providing a holistic assessment of determinants in Nigerian companies. Analyzing data from 50 companies between 2015 and 2020 with a panel regression model, the study revealed that sustainability reporting is mainly influenced by company size, profitability, ownership structure, listing age, leverage, and auditor type.

Onyebuenyi and Ofoegbu (2022) examined the effect of environmental sustainability disclosure on the financial performance of listed oil and gas companies in Nigeria, Namibia, and Kenya. Using the Global Reporting Initiative (GRI) framework with data from 15 companies (2011–2019), they found that emission disclosure had a significant negative effect on return on equity, while energy disclosure had a significant positive effect on gross profit after tax margin. Obiora, Onuora, and Ezeogidi (2022) assessed the impact of environmental accounting disclosure on the profitability of quoted Nigerian firms. Drawing from data between 2017 and 2021 for 25 firms, and using descriptive statistics, correlation analysis, and ordinary least squares regression, they concluded that environmental accounting disclosure significantly impacts return on assets and return on equity.

Rajesh, Rajeev, and Rajendran (2022) comparatively examined the corporate social performances (CSP) of 939 firms from the US, UK, Japan, and Australia between 2014 and 2018 using ANOVA. Results indicated no significant mean differences in CSR strategy scores across the developed economies, but Australian firms had significantly different ESG scores compared to others. Oranefo (2022) studied the effect of firm profitability on environmental

performance among quoted conglomerates in Nigeria from 2011 to 2020 using ordinary least squares regression. The analysis showed that firm profitability significantly influences waste management expenses.

Ezekwesili and Ezejiofor (2022) investigated the effect of firm attributes on environmental performance in Nigerian conglomerates from 2011 to 2020 using ordinary least squares regression. They found that firm size and leverage do not significantly affect waste management expenditure. Alade and Odugbemi (2022) explored the effect of corporate characteristics on integrated reporting implementation among 11 listed oil and gas firms in Nigeria (2011–2020). Using a panel least squares regression technique, they found a positive and significant effect for profitability, firm size, and board size.

Ruiz-Blanco, Romero, and Fernandez-Feijoo (2022) examined characteristics that make firms more or less prone to greenwashing using data from 100 US firms between 2013 and 2016. Regression and correlation analysis revealed that companies in environmentally sensitive industries greenwash less than others. Carmo and Miguéis (2022) investigated why non-listed manufacturing companies in Portugal voluntarily prepare sustainability reports. Using a thematic approach in 2021, they found that reporting was often driven by customer requirements, parent company mandates, and the need to communicate with stakeholders such as customers and local communities. Arshad, Khaled, and Doaa (2022) studied determinants of sustainability reporting decisions in 138 Pakistani firms between 2009 and 2018 using logistic regression. Results showed that gender-diverse boards, larger audit committees, and higher institutional ownership increased the likelihood of reporting, while concentrated ownership, managerial ownership, foreign ownership, and audit committee independence reduced it.

Owolabi (2022) examined factors influencing sustainability reporting practices in Nigeria's listed industrial and domestic goods sector using partial least squares structural equation modeling (PLS-SEM). Findings showed that corporate strategic posture, organizational culture, and organizational structure all had positive and significant effects. Bello and Ogungbenle (2022) analyzed determinants of environmental disclosure in 50 Nigerian manufacturing firms from 2011 to 2013 using regression analysis. They found that profitability, auditor type, board composition, and firm size jointly influence environmental disclosure. Ndum (2022) examined the effect of the Global Reporting Initiative (GRI) on sustainability reporting among Nigerian oil and gas firms from 2010 to 2020 using regression

analysis. The study found that ownership structure significantly affects social sustainability reporting.

Bala, Ezeji, and Babangida (2022) used a generalized least squares approach on 15 Nigerian firms (2016–2020) to investigate the impact of size, leverage, and profitability on sustainability reporting. Results indicated that all three variables negatively affect sustainability reporting. Ponsian, Siasa, and Henry (2021) investigated the influence of firm characteristics on environmental disclosure in Tanzania's extractive industry. Using panel analysis and general least squares (GLS) on data from 18 firms between 2004 and 2018, the study found that firm age has a positive and significant effect on environmental disclosure, indicating that older firms tend to disclose more environmental activities than younger ones. Moruff, Ado, Salisu, and Yunusa (2021) examined the effect of firm attributes on environmental sustainability among nine listed oil and gas firms in Nigeria from 2012 to 2018 using GLS analysis. Results revealed that leverage positively affects environmental sustainability, while firm age has no significant effect.

Ika, Rahayu, Elrifi, and Widagdo (2021) studied the effect of firm attributes on environmental reporting in 128 manufacturing companies in Indonesia from 2008 to 2017 using multivariate regression. Findings indicated that firm attributes positively influence environmental sustainability reporting. Aris, Yusof, Idris, Zaidi, and Anuar (2021) examined the effect of firm characteristics on sustainability reporting among 180 companies listed on Bursa Malaysia from 2014 to 2016 using regression models. The results showed that firm size, firm type, and profitability have a significant effect on sustainability reporting disclosure. Ntui, Mzenzi and Chalu (2021) explored the influence of firm characteristics on environmental disclosure in Tanzania's extractive industry from 2004 to 2018 using panel analysis and GLS. The study found that firm age, firm size, capital structure, and ownership structure significantly and positively influence environmental disclosure, suggesting that older, larger, and more leveraged firms disclose more environmental information.

Hassan and Rabia (2021) investigated whether sustainability reporting contributes to the financial performance of Saudi listed firms. Using regression and ANOVA analysis on data from 519 firms between 2015 and 2017, the study found no association between sustainability reporting practices and corporate financial performance. Ronny and Akhmad (2021) examined the effect of firm characteristics—managerial ownership, firm size, and leverage—on sustainability disclosure levels and firm value in 40 Indonesian companies between 2016

and 2019 using path analysis in SPSS. Results showed no significant effect of these variables on sustainability disclosure. Zayol, Akpa, Tsegba, and Gberindyer (2021) investigated the relationship between firm characteristics and corporate environmental disclosure in 71 less environmentally sensitive listed companies in Nigeria between 2009 and 2018 using panel regression. Findings indicated that firm age and leverage are positively and significantly related to disclosure levels.

Ihimekpen (2021) examined the effect of sustainability reporting on the financial performance of 90 listed non-financial firms in Nigeria from 2010 to 2019 using pooled OLS regression. Results revealed that environmental sustainability reporting has a positive and significant effect on earnings before interest and tax, but an insignificant effect on return on capital employed and gross profit after tax margin. Salawu, Muhammed, Garba, and Salisu (2021) explored the effect of board characteristics on social and environmental disclosure in 50 Nigerian firms from 2012 to 2018 using panel corrected standard error regression. Findings showed that board size, board expertise, board independence, and board gender diversity all have positive and significant effects on disclosure. Olayinka (2021) investigated the effect of corporate governance on economic sustainability reporting among 42 quoted Nigerian companies between 2010 and 2019 using descriptive and inferential statistics. The study found that board size, female directors, and board ownership have positive and significant effects, CEO duality has a negative effect, and independent directors have an insignificant effect on economic sustainability reporting.

Obiamaka, Collins, Akintola, and Kingsley (2021) evaluated the extent of sustainability disclosure in the annual reports of 80 Nigerian oil and gas companies between 2010 and 2019 using a desktop approach. Findings revealed very low levels of climate change and environmental pollution disclosure, with only 13.8% of companies reporting their impact in these areas. Alicia, Amirreza, Antonella, and Eva (2021) investigated factors influencing the adoption of new sustainability reporting practices and external assurance among 366 firms in Africa and Asia in 2017 using logit and regression models. Results showed that being in the manufacturing sector and having a higher proportion of women directors are positively associated with adoption. Solanke, Igbekoyi, Olaniyan, Efuntade, and Nweze (2021) assessed compliance levels and the effect of environmental disclosure on financial performance in 34 Nigerian multinational companies from 2010 to 2020 using multiple regression analysis. Results indicated a positive relationship with return on assets but a negative relationship with earnings per share.

Onyali and Uchegbu (2021) examined the determinants of environmental performance in 18 Nigerian oil and gas firms between 2010 and 2019 using OLS regression. Findings indicated that firm size, profitability, leverage, and liquidity significantly influence waste management expenditure. Olusola, Solanke, Adeusi, Alade, and Agbaje (2021) investigated environmental accounting disclosure and financial performance in 34 Nigerian multinational companies between 2011 and 2020 using descriptive statistics and panel regression. Results showed that among three sectors studied, oil and gas was the least compliant with disclosure practices. Atoyebi and Okpe (2021) analyzed the impact of each dimension of sustainability reporting on financial performance in 31 Nigerian manufacturing firms between 2013 and 2018 using multiple regression. Findings revealed that economic and environmental disclosures have a positive and significant impact on financial performance.

Fatai, Florence, and Helen (2021) examined the effect of sustainability disclosure on firm value among 10 listed deposit money banks in Nigeria between 2014 and 2018 using fixed-effects regression. Results indicated that banks with higher overall and environmental sustainability disclosure tend to have lower firm value. Indriawati, Buana, and Perjuangan (2021) studied the effect of sustainability on firm value in 17 Indonesian non-financial companies between 2016 and 2018 using regression analysis. The study found no significant effect of sustainability reporting on firm value. Abdul and Alsayegh (2021) examined determinants of ESG reporting among 1,244 Asian firms from 2005 to 2017 using regression models. They found that economic performance, profitability, leverage, and size all lead to additional ESG disclosures. Girón et al. (2021) investigated the adoption of new sustainability reporting practices and external assurance among Asian and African firms in 2017 using logit and regression analysis. Findings confirmed that manufacturing sector firms and those with more women directors are more likely to adopt these practices.

Berto (2020) identified drivers of sustainability reporting in 37 Indonesian publicly listed companies between Q1 2012 and Q4 2016 using logit regression. Results showed that CSR performance is positively associated with sustainability reporting, while firm attributes produced mixed results. Muhammed (2020) analyzed the effect of firm size, financial performance, and firm growth on sustainability reporting in 11 Nigerian industrial goods firms from 2010 to 2018 using panel regression. Findings showed that firm size and financial performance negatively affect sustainability reporting. Abdulsalam and Babangida (2020) investigated the effect of sales and firm size on sustainability reporting in 24 Nigerian oil and

gas firms between 2004 and 2018 using panel regression. Results showed that sales growth and leverage have a negative effect, while firm size has a positive effect on reporting and profitability. Kabiru (2020) examined the influence of firm characteristics on environmental disclosure quality in three Nigerian cement companies from 2013 to 2017 using correlation and multiple regression. Findings indicated that firm age, size, and leverage significantly affect disclosure quality.

Hanh and Remmer (2020) assessed whether disclosure is a reliable indicator of performance using data from 251 German firms. Descriptive analysis revealed a weak negative association between environmental performance and reporting, supporting the view that poor performers disclose more to improve image. Wilson, Innocent, Francis, and Jacob (2020) evaluated sustainability report content from 50 Nigerian firms in 2018 using GRI standards and descriptive statistics. Results suggested that there is a lack of commitment to sustainability implementation in Nigeria. Atang and Eyisi (2020) identified determinants of environmental disclosure in 22 Nigerian manufacturing firms in 2016 using multiple regression. They found that an increase in profitability leads to a 1.8% increase in environmental disclosure.

MATERIALS AND METHOD

The study adopted the *Ex Post Facto* research design. This design was adopted because the main aim of the study was to evaluate the cause-effect relationship that exist between the dependent and the independent variable using the data that already existed and the study made no attempt to change it nature and values. The nature of the data used has both cross sectional and content analysis. The data were sourced from the annual financial reports of Nigerian manufacturing firms quoted on the Nigeria Exchange Group. The population was made up of 42 manufacturing firms that are listed on the floor of the Nigerian stock exchange Group up to December, 2024. The total number of listed manufacturing firms are forty-two (42) taken from 20 listed consumer goods firms, 13 listed industrial goods firms and 9 oil and gas firms. The study adopted purposive sampling technique. The basis for this approach was because of the need to select only firms that are listed from 2012 to 2024 accounting periods as well as have complete annual reports over the periods of the study. The list of the sample size made up of 30 manufacturing firms is shown below in Table 1.

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Table 1 Sample Size of the Study

1.	Cadbury Nigeria Plc.
2.	Champion Brew. Plc.
3.	Dangote Sugar Refinery Plc
4.	Guinness Nig Plc
5.	Honeywell Flour Mill Plc
6.	International Breweries Plc.
7.	N Nig. Flour Mills Plc.
8.	Nascon Allied Industries Plc
9.	Nestle Nigeria Plc.
10.	Nigerian Brew. Plc.
11.	Nigerian Enamelware Plc.
12.	P Z Cussons Nigeria Plc.
13.	Unilever Nigeria Plc.
14.	Union Dicon Salt Plc.
15.	Vitafoam Nig Plc.
16.	Austin Laz & Company Plc.
17.	Berger Paints Plc.
18.	Beta Glass Plc.
19.	Cap Plc.
20.	Cutix Plc.
21.	Dangote Cement Plc.
22.	Lafarge Africa Plc.
23.	Meyer Plc.
24.	Tripple Gee And Company Plc.
25.	Conoil Plc
26.	Eterna Plc.
27.	Japaul Gold & Ventures Plc
28.	Mrs Oil Nigeria Plc.
29.	Totalenergies Marketing Nigeria Plc
30.	OandO Plc

Source: Nigerian Exchange Group (2025)

The study used secondary data that covered the period of thirteen years (13) from 2012-2024. Data were collected from the published financial statement of quoted manufacturing firms in the Nigerian Exchange Limited for the various years covered by the study. Content analysis was used to collect data on environmental reporting index. The econometric model of the study with the control variable (firm liquidity) was adapted from the studies by Atang and Eyisi (2020) as shown below:

$EVD_{it} = \beta 0 + \beta_1 ROA_{it} + \beta_2 LIQ it + \mu it$. ……. Eqn 1.

Where:

EVD = Environmental disclosure.

PFT = Firm profitability measured as the ratio of profit after tax to total asset.

LIQ = Firm liquidity measured as current asset over current liability

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α = constant.

β_1 to β_2 = the coefficient of the parameter estimate.

ε = the error term or residual.

i = ith firm for cross-section

t = time period

Table 2 Operationalization of Variables

Variables	**Notation**	**Measurements**
Environmental disclosure	EVD	E1 = Disclosure of Emission_Scope1 is coded 1, otherwise zero E2 = Disclosure of Emission_Scope2 is coded 1, otherwise zero E3 = Disclosure of Emission_Scope3 is coded 1, otherwise zero E4 = Disclosure of Energy_Usage is coded 1, otherwise zero E5 = Disclosure of Water_Usage is coded 1, otherwise zero E6 = Disclosure of Waste_Tones is coded 1, otherwise zero EDI= ((E1 + E2 + E3 + E4 + E5 + E6)/6)*100 = Environmental Disclosure Index
Firm profitability	ROA	Measured as the ratio of profit after tax to total asset.
Liquidity	LIQ	Measure as the ration of current assets over current liabilities

Source: Author's Compilation, 2025.

Secondary data were analyzed using descriptive statistics and panel least squares regression model. The descriptive statistics was used to evaluate the characteristics of the data; Mean, Maximum, Minimum, and Standard Deviation and also check for normality of variables. Panel least squares regression model analysis was used to evaluate the effect of the independent variables on the dependent variable. It reveals the degree of influence and effect the independent variables have on the dependent variable.

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RESULT AND DISCUSSIONS

Descriptive Analysis

Table 3 Descriptive Statistics

	EDI	*ROA*	*LIQ*
Mean	16.82692	0.038644	1.521162
Median	12.50000	0.040611	1.137804
Maximum	87.50000	5.816481	36.41061
Minimum	0.000000	-3.012121	0.005775
Std. Dev.	20.22398	0.397446	2.527921
Skewness	1.602924	6.135731	10.05170
Kurtosis	5.321339	128.5208	124.5155
Jarque-Bera	254.5736	258473.5	246515.2
Probability	0.000000	0.000000	0.000000
Observations	390	390	390

Source: E-Views 10.0 Descriptive Output, 2025

Based on the descriptive statistics in Table 3, the Environmental Disclosure Index (EDI), which serves as the dependent variable, has a mean of 16.83, indicating that, on average, listed manufacturing firms in Nigeria scored relatively low on the environmental disclosure scale based on the Kinder Lydenberg Domini (KLD) index. The median value of 12.5 suggests that more than half of the firms disclosed at a level below the mean, confirming a left-skewed distribution. However, the maximum score of 87.5 reflects that some firms are highly engaged in environmental reporting, whereas others recorded zero disclosure, as indicated by the minimum value. The standard deviation of 20.22 points to wide variability in environmental disclosure levels across firms. With a skewness of 1.60 and kurtosis of 5.32, the distribution is positively skewed and leptokurtic, meaning there are extreme outliers. The Jarque-Bera p-value of 0.000 confirms that the distribution is not normal, suggesting that a few firms are significantly more environmentally transparent than the majority.

In terms of Profitability (ROA), the average return on assets is 3.86%, with a median of 4.06%, suggesting that most firms are moderately profitable. However, the range is extreme, with a minimum of -301% and a maximum of 581.6%, indicating outliers with both massive losses and gains. This variability is confirmed by the standard deviation of 0.397, which is high relative to the mean. The skewness of 6.14 and kurtosis of 128.52 reveal a distribution that is heavily skewed to the right and extremely leptokurtic. The Jarque-Bera p-value of 0.000 strongly confirms non-normality, indicating that profitability varies wildly across firms, with a few outliers dominating the upper tail.

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Finally, Liquidity (LIQ), measured by the current ratio, has a mean value of 1.52, suggesting that on average, firms have more current assets than current liabilities, which is generally healthy. However, the range is very wide, from 0.006 to 36.41, indicating that some firms are either extremely liquid or suffering from liquidity constraints. The median of 1.14 is lower than the mean, pointing to right skewness (skewness = 10.05). The kurtosis of 124.52 is extremely high, showing that the distribution has fat tails and extreme values. This is further confirmed by the Jarque-Bera test p-value of 0.000, demonstrating that liquidity is very uneven across firms and far from normally distributed.

Test of Hypothesis

H_o**:** Return on asset has no significant effect on environmental disclosure index of listed manufacturing firms in Nigeria.

H_i**:** Return on asset has significant effect on environmental disclosure index of listed manufacturing firms in Nigeria.

Table 4: Panel Least Square Regression Analysis

Dependent Variable: EDI
Method: Panel EGLS (Cross-section weights)
Date: 06/26/25 Time: 03:39
Sample: 2012 2024
Periods included: 13
Cross-sections included: 30
Total panel (balanced) observations: 390
Linear estimation after one-step weighting matrix
Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.610080	0.241775	2.523334	0.0010
LIQ	-0.506981	0.281786	-1.799167	0.0728
C	15.51980	0.596255	26.02878	0.0000
	Weighted Statistics			
R-squared	0.008646	Mean dependent var		24.59798
Adjusted R-squared	0.003522	S.D. dependent var		24.53577
S.E. of regression	19.75416	Sum squared resid		151017.8
F-statistic	1.687538	Durbin-Watson stat		1.727463
Prob(F-statistic)	0.186333			

Source: E-Views 10.0 Regression Output, 2025

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Table 4 reports the results for firm profitability. The adjusted R-squared value is 0.0035, meaning that profitability and liquidity explain approximately 0.35% of the variance in environmental disclosure, indicating poor model fit. The model's F-statistic is not significant ($p = 0.1863$), suggesting that the included variables do not significantly explain variations in environmental disclosure. The Durbin-Watson value of 1.73 is acceptable, indicating minimal serial correlation.

The constant ($C = 15.5198$, $p = 0.0000$) is statistically significant and implies that when ROA and liquidity are held constant at zero, EDI is expected to be 15.52 units. The coefficient for profitability ($\beta = 0.6101$) indicates that a one-unit increase in ROA leads to an increase of 0.61 points in environmental disclosure.

Decision: This effect is statistically significant at the 5% level ($p = 0.0010$). Thus, alternate hypothesises accepted that Firm Profitability has a significant and positive effect on environmental disclosure of manufacturing firms in Nigeria ($\beta = 0.6101$, $p = 0.0010$).
Several studies in the empirical review support this finding. For instance, Bello and Ogungbenle (2022) found that profitability, alongside auditor type, board composition, and firm size, jointly influences environmental disclosure in Nigerian manufacturing firms, which aligns with the positive effect observed in this study. Similarly, Alade and Odugbemi (2022) reported a positive and significant effect of profitability on integrated reporting in the oil and gas sector, further reinforcing the notion that financially strong firms tend to disclose more. Oranefo (2022) also found that profitability significantly influences waste management expenses among quoted conglomerates in Nigeria, indicating that profitable firms allocate more resources to environmental performance. Additionally, Atang and Eyisi (2020) documented that increases in profitability correspond with increases in environmental disclosure among Nigerian manufacturing firms. These findings contrast with those of Bala et al. (2022), who observed a negative relationship between profitability and sustainability reporting, and Okerekeoti (2022), who found no significant effect of profitability on social sustainability reporting. Nonetheless, the majority of supporting evidence underscores the tendency of profitable firms to expand their environmental disclosure efforts.

CONCLUSION AND RECOMMENDATION

The finding that firm profitability has a significant and positive effect on environmental disclosure of manufacturing firms in Nigeria suggests that financially successful firms are more willing and able to engage in transparent reporting of their environmental activities. Profitability provides these firms with the necessary financial resources to invest in environmental initiatives and the systems required to document and disclose them. In addition, profitable firms often face stronger public scrutiny and higher stakeholder expectations, which may push them toward greater accountability in environmental matters. By disclosing more environmental information, these firms not only comply with regulatory requirements but also enhance their corporate image, strengthen investor confidence, and potentially secure competitive advantages in attracting socially responsible customers and investors. This relationship may also be influenced by the fact that profitable firms tend to have better managerial capacity and more robust corporate governance structures, which can facilitate comprehensive environmental reporting practices. The study recommends that managing directors and internal sustainability teams of profitable manufacturing firms should institutionalize environmental reporting as part of their corporate performance communication, leveraging available profits to invest in structured disclosure systems and third-party assurance mechanisms that enhance credibility.

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