

EFFECT OF ENVIRONMENTAL DISCLOSURE ON FINANCIAL PERFORMANCE OF LISTED NON-FINANCIAL FIRMS IN NIGERIA

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Abstract

In the context of corporate sustainability and responsible business practices, the effect of environmental disclosure on the financial performance of firms in Nigeria has become a subject of increasing significance. Therefore, this study main objective of this study was to examine the effect of environmental disclosure on financial performance of listed non-financial firms in Nigeria from 2012 to 2022. Secondary data were sourced from the audited annual reports of the listed firms. The population of the study is 104 non-financial firms. A sample of 80 non-financial firms was drawn from the population using purposive sampling techniques. The null hypotheses were tested using pooled regression, fixed effect and Panel Corrected Standard Error (PCSE) techniques. Environmental disclosure was measured using GRI index while financial performance was measured using ROA, ROE, EPS. The controls variables used in the study include firm size, firm age and leverage. The study found that environmental disclosure has a significant negative effect on the ROA of listed non-financial firms in Nigeria. Environmental disclosure has a significant negative effect on the ROE of listed non-financial firms in Nigeria. Environmental disclosure has an insignificant effect on the ESP of listed non-financial firms in Nigeria. Firm age, firms size and leverage significantly affects financial performance of listed non-financial firms in Nigeria. The study concludes that environment disclosure significantly affect financial performance of listed non-financial firms in Nigeria. The study recommends that management of non-financial firms should focus on initiatives that provide both environmental and financial benefits, such as green technology or renewable energy solutions, which can reduce long-term costs and generate goodwill among stakeholders.

Keywords: Environmental Disclosure, Earning Per Share, Return on Asset, Return on Equity.

1. INTRODUCTION

The degree of environmental damage and the increasing worry among stakeholders have made environmental accounting a major field of accounting relevant. Environmental sustainability has been more important in the global corporate scene recently as companies under more pressure to include environmental factors into their activities. Environmental accounting is the way environmental data is combined into financial reporting (Malik et al., 2023). Like many other nations, Nigeria has seen increasing awareness of environmental problems which has driven businesses to use environmental accounting techniques. This covers revealing details on environmental performance, projects, and hazards in financial reports.

Non-financial companies have possibilities as well as problems as the world moves toward sustainability. Understanding the link between environmental disclosure and financial success helps companies present themselves effectively in the developing green economy, where environmentally friendly behavior is progressively appreciated. In their decision-making process, investors give environmental, social, and governance (ESG) elements more and more thought. Examining the effects of environmental disclosure helps one to better understand how ESG factors affect investor behavior, therefore affecting the availability and cost of capital for

non-financial companies. The intersection of business and environmental sustainability has garnered increasing attention, with non-financial firms facing growing pressure to disclose their environmental practices.

The motivation for studying the effect of environmental disclosure on the financial performance of non-financial firms is grounded in the recognition of the complex interplay between environmental responsibility and economic outcomes. This study proxy environmental disclosure using the Global Reporting Initiative (GRI) template, while financial performance is proxied as Return on Asset (ROA), Return on Equity (ROE), and Earnings Per Share (EPS). The study also introduced control variables, namely firm size, leverage and age. According to the legitimacy theory and stakeholder theory, larger firms are more visible and tend to disclose more information to legitimize their operations and activities, and to meet the expectations of society and stakeholders. Compared to small firms, larger firms are subject to increased pressure from society. These pressures push larger firms to disclose more environmental information than small firms (Rover et al., 2015). Moreover, the accumulation and publishing of environmental information is less costly for larger firms (Pahuja, 2009). Larger firms have more ability and sufficient resources to afford the costs of producing information (Welbeck et al., 2017).

On the other hand, firms can alleviate the conflicts of interest between debtholders and shareholders by disclosing more information. Highly leveraged firms tend to disclose more environmental information in order to satisfy debtholders and gain their confidence, and to provide evidence that the firm's projects are not so risky (Kouloukoui et al., 2019). Furthermore, Environmental disclosure mitigates the concerns about the transfer of wealth from debtholders to shareholders (Rover et al., 2015; Kouloukoui et al., 2019). Fonseca et al. (2019) and Luo et al. (2019) found that environmental disclosures result in lower debt costs. Put together, environmental disclosure contributes to a low cost of capital by reducing the agency costs of debt and information asymmetry.

In the context of corporate sustainability and responsible business practices, the effect of environmental disclosure on the financial performance of firms in Nigeria has become a subject of increasing significance (Abubakar & Sadiq, 2023; Arumona et al., 2021; Ayu et al., 2020). While there is a growing awareness of the need for businesses to adopt environmentally sustainable practices, the precise effect of environmental disclosure on the financial performance of Nigerian, Non-Financial firms remains unclear. This study seeks to address the following key issues.

First, despite the increasing importance of environmental accounting disclosure globally, there is a dearth of empirical evidence specifically tailored to Nigerian non-financial firms. The absence of localised studies hinders the ability to comprehend the unique relationships between environmental disclosure practices and financial outcomes for non-financial firms operating in Nigeria. Studies such as Delmas and Nairn-Birch (2011); Hossain and Reaz (2017); Kalash (2020); Mikial, et al. (2018); Rahman (2017); Tuhin et al. (2021) were conducted outside Nigeria. Thus, its findings cannot be generalized to Nigeria.

Secondly, Nigeria lacks a standardize measure for environmental accounting disclosure studies. Prior studies used dichotomous measures (1 for disclosed items and 0 for non-disclosed items) for environmental disclosure. These studies include Abubakar and Sadiq (2023); Igbekoyi et al. (2021); Tuhin et al. (2021) and Malik et al. (2023). Salawu (2020) adopted the Kinder Lyderberg Domini (KLD) indices to measure environmental disclosure. While, Kurawa and Shuaibu (2022) and Suttipun et al. (2023) used GRI index. The use of different measures may result in inconsistent and divergent views on disclosure practices among non-financial firms. This raises questions about the reliability and comparability of disclosed information, impacting the ability of stakeholders to assess the environmental and financial performance of these firms.

Thirdly, the lack of clarity on how environmental accounting disclosure directly influences financial performance metrics for non-financial firms in Nigeria remains a significant concern. It is unclear how investors and other stakeholders interpret and incorporate environmental information into financial decision-making processes, potentially leading to a lack of recognition for environmentally responsible firms. Ogiriki and Igo (2022) study found that environmental disclosure does not affect the financial performance (measured as return on asset) of listed firms. Abubakar and Sadiq (2023) found that environmental disclosure has a positive effect on financial performance. Iyoha and Igbinovia (2023) measured performance using Tobin Q. While Kurawa and Shuaibu (2022) used Earning Per Share and Tobin Q. The current study intends to fill this gaps by examining the effect of environment disclosure on financial performance measured by return on asset, return on equity, earnings per share

Fourthly, the implementation of robust environmental accounting practices may introduce additional costs for non-financial firms in Nigeria (Delmas & Nairn-Birch, 2011; Iyoha & Igbinovia, 2023; Malik et al., 2023). The lack of understanding regarding how these additional costs translate into financial performance outcomes poses a challenge. Determining whether such investments yield positive financial returns remains uncertain.

Lastly, prior studies focused on other sectors namely Abubakar and Sadiq (2023) examined the impact of environmental disclosure on financial performance of cement manufacturing companies in Nigeria. Igbekoyi et al. (2021) study centered on listed manufacturing firms in Nigeria. While Eniola (2022) used a case study of Oando Plc. Erinoso and Oyedokun (2022) expand this study to all listed oil and gas firms in Nigeria. However, environmental risks have the potential to impact the financial performance of non-financial firms in Nigeria. The extent to which effective environmental accounting disclosure contributes to financial resilience is not well-established. The lack of clarity on this relationship hampers the ability of firms to proactively address environmental challenges.

In addressing these issues, this study seeks to unravel the intricacies of the effect of environmental disclosure and financial performance for non-financial firms in Nigeria. By providing empirical insights and recommendations, this research aims to contribute to the advancement of sustainable business practices in the Nigerian corporate landscape.

Research Hypotheses

The hypotheses are presented in its null form:

- H₀₁: Environmental disclosure has no significant effect on return on asset of listed non-financial firms in Nigeria.
- H₀₂: Environmental disclosure has no significant effect on return on equity of listed non-financial firms in Nigeria.
- H₀₃: Environmental disclosure has no significant effect on earning per share of listed non-financial firms in Nigeria.

2. LITERATURE REVIEW

Environmental Disclosure

Ong et al. (2016) viewed as a statement that shows the company's environmental efforts including company's objectives, environmental policies and environmental impacts, which are reported and published annually to the general public. Dibia and Onwuchekwu (2015) and Malik et al. (2023), opined that environmental disclosure helps companies capture public perception toward their operation. Environmental disclosure serves as a medium of communication between the company and stakeholders, disclosure is necessary because of the importance of the environment and the devastating impact of companies activities on the environment (Abubakar et al., 2017). Based on the conceptions of the above authors, environmental disclosure is about the information that relates to environmental activities, these activities could be in the past, present or future, it should be reported annually to the public. This information can be in the form of financial and non-financial information and quantitative or qualitative in nature. This study therefore defines environmental disclosure as a disclosure that covers all information relating to the environment, this information is disclosed or made available through the company's annual report. Furthermore, environmental disclosure entails that a company is required by law to voluntarily or statutorily provide environmental information in annual reports. It can be deduced also that environmental disclosure communicates relevant information as a result of the company's operations as it affects the environment to stakeholders and society as a whole.

A review of literature showed that studies on environmental disclosure has been measured either quantitatively using content analysis or qualitatively using the environmental disclosure index. Previous studies have shown that some researchers used both quantitative and qualitative approaches to measure environmental accounting disclosure. Researchers such as Abubakar et al. (2017), Adams and Busola (2017), Ong et al. (2016) and Buniami (2010) used both approaches to measure the environmental accounting disclosure of companies. According to Neuman (2011), the quantitative approach to environmental disclosure measurement is the use of objective and systematic counting and recording procedures to produce a description of the content in the text. Ong et al. (2016), stated that the quantity of environmental accounting disclosure can be measured using content analysis which is considered to be the famous

technique employed by previous studies. It can be measured using word count, sentence count and page count. Annual reports of firms contain both financial and non-financial information, this financial information is easily interpreted using financial ratios while non-financial information can be interpreted using a research tool known as content analysis (Adams & Busola, 2017). According to Zhang and Wildermith, (2009), content analysis places importance on non-financial information; speeches, texts and specific context. Information can be measured per category or per company by counting the data items i.e number of sentences and number of pages (Hassan & Marston, 2010). According to Krippendorf (1999), as cited in Adams and Busola (2017), content analysis is a research technique that is used for making replicable and valid inferences from data to their context. It is a research tool used for contextualized interpretation of documents. The quantitative approach to measurement of environmental disclosure has been employed in prior researches to measure environmental disclosure in studies conducted by Ajibolade and Umuigbe (2012), Akinlo and Iredele (2014), Bassey et al. (2013), Eljayash (2015), Iyoha and Igbinovia (2023), Juman (2014), Oba and Fodio (2012), Onyali, et al. (2014), Ogiriki and Igo (2022), Uwuigbe, (2011).

Solomon (2020) noted that the second approach to measuring environmental disclosure is the qualitative approach. The quality of environmental disclosure is often difficult to measure, and remains an area of interest and controversy in academic literature (Adams & Busola, 2017). There is no generally accepted measurement of disclosure quality, however, several academic literatures have measured environmental disclosure quality based on how the researchers deem fit and the purpose of the study. The definition of environmental disclosure put forward by Saddique (2015) views qualitative environmental disclosure as the quality attributes as given by the most used environmental and accounting regulating framework and guidelines. A qualitative approach is also known as the scoring measure. Researchers quantify the provided environmental information when using this measurement tool by identifying specific items, and then analyze using a scoring system (Elshabasy, 2017). The quality of environmental disclosure of a company is very crucial in evaluating the company's environmental performance and is regarded as the key value for corporation growth (Ong et al., 2016).

The quality of environmental disclosure can be determined through disclosure index (Eljayash 2015). According to Ibrahim (2014) when using the disclosure score for each company under study, items identified are measured by counting the total number of items disclosed by each company and divide by each company and divide by the total items in the study disclosure. Prior studies that used the qualitative approach of measurement for environmental disclosure include; Eljayash (2015), Uwuigbe (2012), Galari, et al. (2011) and Salah (2009).

Financial Performance

Financial Performance has been defined by various authors in extant literature. According to Verma (2019) financial performance in broader sense refers to the degree to which financial objectives has been accomplished. It measures results of a firm's policy and operations in monetary term, and overall financial health over a period of time. It can also be used to compare similar firms across the same industry, industries or sectors. In this study financial performance is measured as return on asset, return on equity, and earnings per share.

Return on Asset

Return on Assets (ROA) is a financial metric used to evaluate a company's efficiency in generating profits from its assets. There are various ways to define and calculate ROA, and the specific formula might vary slightly based on the source. Return on Assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is calculated by dividing net income by average total assets. The formula is expressed as Net Income divided by Average Total Assets.

Return on Equity

Berman et al. (2013) defined ROE as what percentage of profit the company makes for every monetary unit of equity invested in the company. ROE doesn't specify how much cash will be returned to the shareholders, since that depends on the company's decision about dividend payments and on how much the stock price appreciates. However, it's a good indication of whether the company is even capable of generating a return that is worth whatever risk the investment may entail. ROE is usually calculated by dividing net profit by average shareholders' equity.

Earnings Per Share

Earnings Per Share (EPS) is a financial metric that represents the portion of a company's profit attributable to each outstanding share of its common stock. It is a key indicator of a company's profitability on a per-share basis and is widely used by investors and analysts to assess a company's financial performance. According to Brigham and Ehrhardt (2013), EPS is a financial ratio calculated by dividing a company's net income (after taxes and preferred dividends) by the average number of outstanding common shares during a specific period. It reflects the profitability of the company on a per-share basis, providing insights into the earnings available to each common shareholder. The measure EPS as net income minus preferred dividends dividend by weighted average common shares outstanding.

Control Variables

Firm Size

The size of a company is the most commonly analyzed feature in the reviewed studies to explain the level of disclosure in general. According to Roberts et al. (2005), firm size plays an important role in determining the extent of information disclosure in annual reports. Ousama and Fatima (2010) explain the relationship between firm size and the extent of disclosure. Bronson et al. (2006) and Macagnan (2007) tested the size hypothesis. Large companies have a greater number of contracts between managers and shareholders than small companies and, hence, a greater principal-agent problem. Eniola (2022) reported that a higher level of disclosure might reduce agency costs between managers and shareholders. Another motivation for increased disclosure in a large company is the existence of a more complete information system, which would allow lower costs of obtaining and publishing information compared to those incurred by a small company. It is also understood that a smaller company is more vulnerable to a loss in competitive advantage than a larger company.

Leverage

Leverage one of the important items in the capital structure of companies and it provides a medium for corporate financing as firms borrow money in order to obtain the capital, they require for operating their businesses. According to Eniola (2022), leverage can either be short-term or long-term. Short-term leverage represents funds needed to finance the daily operations of the firm, such as trade receivables, short-term loans and inventory financing. Given that firms with higher leverage levels incur more agency costs (potential wealth transfers from debtholders to shareholders and managers), they seek to reduce these costs and information asymmetries by disclosing more information to satisfy the needs of creditors for information.

Firm Age

Firm age is a multidimensional concept, and its definition can vary depending on the context and the specific focus of research. Firm age refers to the number of years since the establishment or inception of a business entity. It is a straightforward measure that indicates how long a company has been in operation. Firm age is considered a fundamental characteristic when analyzing businesses and understanding their lifecycle, growth patterns, and potential challenges.

Theoretical Review

Positive Accounting Theory (PAT) provides a theoretical framework that focuses on explaining and predicting accounting practices based on the assumption that firms are motivated by self-interest and seek to maximize wealth. In the context of environmental sustainability disclosure and financial performance, PAT can be applied to understand the relationships and motivations that drive firms to disclose information about their environmental practices. According to Watts and Zimmerman (1978), Positive Accounting Theory acknowledges that information asymmetry exists between management and external stakeholders. Firms may engage in environmental sustainability disclosure to reduce this information asymmetry, providing stakeholders with information about their environmental performance. By doing so, firms aim to enhance transparency and reduce uncertainty, potentially leading to increased investor confidence.

Positive Accounting Theory provides insights into the motivations and behaviors of firms regarding environmental sustainability disclosure and its relationship with financial performance. Firms may strategically disclose environmental information to reduce information asymmetry, address contractual obligations, comply with regulations, influence market reactions, and conduct cost-benefit analyses that align with their self-interest and wealth maximization goals. The relationship between environmental sustainability disclosure and financial performance is thus analyzed through the lens of managerial decision-making and opportunism within the framework of Positive Accounting Theory.

The second theory is the stakeholders theory by Freeman came up with the stakeholder theory (1984). According to the hypothesis, organizations disclose environmental information as a result of stakeholder pressure, and that an organization would respond to the worries and

expectations of influential stakeholders, with some reactions taking the form of strategic disclosures. The society, shareholders, creditors, workers, customers, and suppliers, all of whom may be interested in the business's social and environmental actions, are stakeholders in the context of a business. These individuals are referred to as stakeholders by Freeman (1984). Stakeholders vary in terms of their type and extent of influence on a company's operations. Organizations are thus responsible to these stakeholders and rely on their continual approval to sustain a successful operating environment, according to Roberts (1992).

Empirical Review

This section reviews studies conducted outside Nigeria. Al-Dosari et al. (2023) examine the oil and gas industry, drawing on neo-institutionalist scholarship to concentrate on the mimetic, coercive, and/or normative effects discernible in the industry's non-financial disclosure (NFD) behaviour. Size, ROA, Leverage, Assurance, CSR committee, CSR report, GRI, UNGC and OECD GRI descriptive statistics. The study found that NFD increases immediately after the directive's publication and further increases during the implementation phase. Second, the directive has a spillover effect, sparking significantly increased NFD among non-EU firms during the implementation period. Third, the NFD level of non-EU firms is associated with the number of EU employees and the extent of EU operations of these firms, but only following the implementation of the directive.

Aditi and Madhumita (2021) empirically examine the relationship between corporate social responsibility disclosure (CSR D) and financial performance (FP) in Indian firms. The variables used include corporate social responsibility disclosure, ROA, ROE, Tobins Q. The hypotheses were tested using multiple regression analysis. The results of this study indicate that the aggregate CSR D measures, both for quality and quantity, have a positive association with the accounting measures of firms' FP. However, the market measure of FP is observed to have a statistically insignificant association with the aggregate quality and quantity of CSR D of Indian firms.

Andrew et al. (2021) examined the effect of environmental disclosure on the environmental performance for listed mining companies in China. Our analysis used China's Environmental Information Disclosure Degree (EIDD) and the Chinese Securities Regulatory Commission's disclosure guidelines to propose the Environmental Information Disclosure Index. Using panel data for the period 2000–2018. SIZE, ROE, LEV, ROE, EADI. The model was tested using Common Correlated Effects Mean Group (CCEMG) and Augmented Mean Group (AMG). The findings from our studies affirm the fact that increase in environmental information disclosure reflects in an increase in the environmental performance of mining companies.

Rihab et al. (2021) examine and compares the relationship between risk disclosure and corporate attributes in Islamic and conventional banks. Using a comprehensive risk disclosure index covering nine dimensions, we analyse the level of risk-related disclosure (RRD) in a sample of 72 Islamic banks and 97 conventional banks across 11 countries. Bank Size, total assets, ROA, Bank Age. OLS regression results encourages regulators to improve corporate governance mechanisms in their banking systems through the optimization of ownership

structure (dispersed ownership) and the board's composition in order to promote higher level of transparency and RRD.

This sections reviews studies on the effect of environmental disclosure on financial performance with focus on Nigeria. Olaoye and Alao (2023) examine the effect of green accounting practice on business health of listed oil and gas firms in Nigeria. The variables used include EPS, Propriety ratio, Return on Asset Waste management practice disclosure, Safety relation practices disclosure and Green restoration practices disclosure. The inference of this discovery is that waste management practices disclosure has no potency to significantly influence earnings per share of listed oil and gas firms in Nigeria. It is negative, probably because avoidance or ineffective waste reduction or waste avoidance tends to maximize cost in the organization, thereby resulting in low performance and sustainability.

Abubakar and Sadiq (2023) study examined the impact of environmental disclosure on financial performance of listed cement manufacturing companies in Nigeria for the period 2017 to 2021. Environmental disclosure, return on asset, waste management cost and ISO 14031 and GRI were used as both dependent and independent variables. The finding indicated that environmental disclosure has positive effect on financial performance of listed companies in Nigeria. Simply say, financial performance companies and environmental disclosure are highly correlated as higher levels of disclosure will result to a better financial performance of a company.

Enekwe et al. (2023) examine the effect of environmental costs on the financial performance of listed oil and gas companies in Nigeria. The ex-post facto research design was employed for the collection of financial statements of four listed oil and gas companies in Nigeria for a ten-year period from 2010 to 2019. The variables used include ROA. The hypotheses were Panel Ordinary Least Square The findings revealed that staff development costs have a negative but insignificant effect on listed Nigerian oil and gas companies' return on assets, while community development costs and employee health and safety costs have a positive but insignificant effect.

Iyoha and Igbinovia (2023) examined environmental information disclosures and value of agro-manufacturing firms listed on the Nigerian Exchange Group (NXG). The conflicting arguments between free market capitalism and eco-modernist theorists and the paucity of empirical evidence on the place of carbon accounting, environmental consciousness, environmental disclosures, and firm value relying on the submissions of the signaling and legitimacy theories necessitate the study. The study adopted an ex post facto research design. A census of the entire five (5) agricultural firms, twelve (12) industrial goods firms, and three (3) consumer goods firms to make a sample size of twenty (20) firms listed in the NXG from 2014 to 2020 was taken. The panel least squares estimation technique is adopted. The result revealed that effluent and waste, and biodiversity information disclosures exhibit positive significant impact on firm value of Agro Manufacturing firms in the NXG while cost on environmental activities as well as compliance to environmental laws information disclosures exhibit positive insignificant impact on firm value of Agro Manufacturing firms in the NXG. The positive relationships are in conformity with signaling theory, i.e., environmental

information disclosure signals firm environmental consciousness, and this tends to improve the value of the firm in the long run. The study recommends that a legal framework for environmental reporting in Nigeria be promulgated, as it will serve as a basis for environmental reporting practices and upon which appropriate sanctions will be meted out on defaulting companies

Olagunju and Ajiboye (2022) examined how environmental accounting disclosure influences the market value of listed non-financial firms in Nigeria between 2012 and 2020. The variables used include earnings per share (EPS), environmental disclosure using Global Reporting Initiatives (GRI). Panel Regression was used to test the hypotheses. This study found robust proof which suggests that environmental disclosure significantly influence market value of listed non-financial firms in Nigeria. The implication is that non-financial firms in Nigeria are yet to show much concern about the physical environment.

Gaps in Literature

While there has been significant research on the relationship between environmental disclosure and financial performance, there are still gaps in the literature that provide opportunities for further exploration and investigation. Here are some gaps: Most studies focus on companies in developed economies such as Arleta and Jarosław (2022); Al-Dosari et al. (2023); Ayman (2022); Deepali and Divya (2023); Malik et al., (2023); Mehak et al. (2022); Muttanachai et al. (2023); Suttipun et al. (2023); Santi (2022); Zara et al. (2022) leaving a gap in the understanding of how environmental disclosure affects financial performance in emerging markets or regions with different regulatory environments and cultural attitudes towards sustainability.

Studies such as Purnima and Shalini (2022); Olaoye and Alao (2023); Purnima and Shalini (2022); Suttipun et al. (2023) often rely on traditional financial metrics, such as return on assets or stock prices, to measure financial performance. Exploring the use of alternative financial performance measures or integrating accounting financial indicators can provide a more nuanced understanding of the relationship.

The previous literature suggested that environmental disclosure reduces the asymmetric information costs, agency costs and the cost of capital. Firms legitimize their activities to stakeholders by disclosing environmental information (Arleta & Jarosław, 2022; Malik et al., 2023; Santi, 2022) focuses on the impact of environmental disclosure on financial performance. This legitimization may increase sales and decrease cost of capital because consumers and investors prefer firms with good environmental reputation (Clarkson et al., 2013; Dhaliwal et al., 2011). Plumlee et al. (2015) indicated that voluntary environmental disclosure is related to firm value through cash flows and cost of equity. The previous arguments lead us to conclude that environmental information disclosures enhance firm's financial performance. The prior empirical studies provide mixed results about this issue. Li et al. (2018), and Aboud & Diab (2018) found that environmental, social, and governance (ESG) disclosures have positive impact on firm value.

Similarly, the results of Minutolo et al. (2019) indicated that (ESG) disclosures enhance firm value and return on assets. Clarkson et al. (2013) found that environmental disclosure positively affects return on assets while Longoni & Cagliano (2018) found a positive relation between environmental disclosure and return on investment. Lemma et al. (2018) showed that environmental disclosures reduce the cost of capital. Hassan & Romilly (2018) and Hassan (2018) indicated that economic performance and firm value are positively associated with environmental disclosure. Yin et al. (2019) found that environmental disclosure positively affects the return on equity. Khlif et al. (2015) investigated the relation between social and environmental disclosure and firm value in two countries (South Africa and Morocco). They found that social and environmental disclosures significantly and positively affect the firm value only in South African sample. In contrast, Mathuva & Kiweu (2016) document a negative relation between social and environmental disclosure and both return on assets and return on equity. Li et al. (2017) reported similar findings. However, other studies found that environmental disclosures do not affect the financial performance (Qiu et al., 2016; Kolsi & Attayah, 2018; Lu & Taylor, 2018; Deswanto & Siregar, 2018).

Addressing these gaps in the literature will contribute to a more comprehensive understanding of the complex interplay between environmental disclosure and financial performance, providing valuable insights for both researchers and practitioners in the fields of finance and sustainability.

3. RESEARCH METHODOLOGY

This study adopts ex-post facto research design. The panel data for this study are sourced from the annual audited report of listed non-financial firms in Nigeria. A study population is a group considered for a study or statistical reasoning. The population of this study include all non-financial firms in the Nigeria Exchange Group as at 2023 were 104 firms.

The study adopts two major criteria in selecting the firms for the study. A purposive sampling technique will be used select firms from population. First, the firms must be listed on the NGX for the period under review (i.e, 2012 to 2023) and also the study will use firms that have complete data spanning the period of the study. Based on this criteria, 80 firms were selected.

The study used panel regression analysis to analyze the data, which is a blend of time series and cross-sectional data. The study adopted panel regression analysis as a tool for data analysis. This method is relevant to the study and the data for the study is panel data, which is a combination of time series and cross section data.

This analysis is also known as longitudinal or repeated measures data. It combines both dimensions and offers valuable insights into individual behaviors and the dynamics of change. The data analysis allows a greater understanding of complex relationships by capturing both within-unit variations and between-unit variations. Moreover, it effectively accounts for individual-specific effects and time-related influences.

Model Specification and Variable Measurement

The panel regression model that captures the effects of environmental disclosure on financial performance of listed non-financial firms in Nigeria is presented below:

$$ROA_{it} = \alpha + \beta_1 ENVD_{it} + \beta_2 FS_{it} + \beta_3 FA_{it} + \beta_4 LEV_{it} + \varepsilon_{it}$$

$$ROE_{it} = \alpha + \beta_1 ENVD_{it} + \beta_2 FS_{it} + \beta_3 FA_{it} + \beta_4 LEV_{it} + \varepsilon_{it}$$

$$EPS_{it} = \alpha + \beta_1 ENVD_{it} + \beta_2 FS_{it} + \beta_3 FA_{it} + \beta_4 LEV_{it} + \varepsilon_{it}$$

Table 1: Description of Variables

Variables	Type	Description	Source
ENVD	Independent variable	the number of environment items disclosed by firm based on GRI template	Kurawa & Shuaibu (2022)
ROA	dependent variable	Measured as net income divided by total assets	Malik et al. (2024)
ROE	dependent variable	the net profit divided by the shareholders equity	Kalash (2020)
EPS	dependent variable	Divides net earnings available to common shareholders by the average outstanding shares over a year	Kurawa & Shuaibu (2022)
FS	Control variable	The natural log of total asset	Yadav et al. (2021)
FA	Control variable	Measured as the number of years the firms has been in existence. i.e., year of incorporation to date	Malik et al. (2024)
LEV	Control variable	Measured by dividing total debt by total assets	Malik et al. (2024)

Source: Authors compilation (2025)

4. DATA ANALYSIS AND RESULT

Descriptive Statistics

Descriptive statistics of the variables were analysed out to show the behaviour of the data using mean, standard deviation, minimum and maximum.

Table 2: Descriptive Statistics

Variables	Mean	Std Dev.	Min	Max
ROA	.1811193	4.741969	-2.359907	139.5148
ROE	.3530784	9.703344	-128.5294	245.0682
EPS	41.07997	186.597	-2076	2176
ENVD	14.35142	27.24644	0	100
FS	1.68	9.50	-216749	1.46
FA	40.4125	19.18295	3	99
LEV	1.19	3.25	572.91	9.60

Source: Authors compilation (2025)

Table 2 depicts that the average (mean) ROA is 18.1%, which implies that on the average, non-financial firms in Nigeria generate significant profits from their total assets. The dispersion which is measured as the standard deviation around the mean, stood at 474%. The minimum and maximum values of ROA are -235.9% and 13951%, respectively. This finding implies that

some non-financial firms utilize larger assets to generate profits while others use fewer assets to generate their profits. Table 4.1 also depicts that, the average ROE of non-financial firms in Nigeria is 35.3% with a deviation of 970.3%. This implies that despite the high average value of ROE in non-financial firms, the variability or ability of the firms to generate profit from shareholders' funds is high. The minimum and maximum ROE are -12,852.9% and 24,506.8% respectively. The average EPS of non-financial firms in Nigeria is approximately N41.07, while the minimum and maximum are N-2076 and N2176, respectively. The deviation from the average is N186.59. Table 2 depicts the average environmental disclosure of non-financial firms in Nigeria. According to the output, the average environmental disclosure is 14.35% with a deviation of 27.24%. The minimum and maximum are 0% and 100% respectively.

Table 2 explains the descriptive statistics of the control variables used in the study. First, the average size of non-financial firms is N1.68 trillion with a minimum and maximum of N216,749 billion and N14.6 trillion. The average age of non-financial firms in Nigeria is 40.41 years with a deviation of 19.18 years. The minimum and maximum years are 3 years and 99 years respectively for the period under review. Also, table 4.1 shows that the average leverage of the firm is N1.19 trillion with a deviation of 3.25 billion. This implies that non-financial firms are highly indebted.

Correlation matrix

This section presents the pairwise correlation matrix which describes the relationship among the independent and dependent variables. The result of the test is presented in Table 4.2.

Table 3: Correlation Matrix

	ROA	ROE	EPS	ENVD	FA	FS	LEV
ROA	1.0000						
ROE	0.8567	1.0000					
EPS	0.0393	0.0296	1.0000				
ENVD	-0.0158	-0.0158	0.0683	1.0000			
FA	0.0128	0.0118	0.0724	0.1117	1.0000		
FS	0.0200	0.0200	0.1632	0.2904	0.0510	1.0000	
LEV	0.0261	0.0250	0.1232	0.3228	0.1141	0.9145	1.0000
VIF	3.69			1.12	1.04	6.20	6.38

Source: Authors compilation (2025)

Table 3 illustrates the relationship analysed using a correlation matrix between environmental disclosure and the financial performance of listed non-financial firms in Nigeria. The result shows that the relationship between ROA and environmental disclosure is negative. Similarly, the relationship between ROE and environmental disclosure is negative. The result is positive when financial performance is proxied using EPS. This implies that increasing environmental disclosure decreases financial performance (ROA, ROE) but increases EPS. Table 3 reveals that older firms perform better. That is, firm age correlates positively with financial performance (ROA, ROE, EPS). Also, firm size positively correlates with all financial performance proxies. Likewise, the result also showed that leverage positively correlates with financial performance. The study concludes that the control variables positively relates with

financial performance. The regression analysis was subjected to a multicollinearity test to detect the presence of collinearity among the variables. The result shows that the mean of the Variance Inflation Factor (VIF) was 1.11, which is much lower than the threshold of 10. The VIF for individual variables was also very low. This indicates that the explanatory variables included in the model were not correlated, indicating an absence of multicollinearity between the variables.

Test of Hypotheses

In chapter three, four models were developed to empirically test the effect of environmental disclosure on financial performance (ROA, ROE, EPS) of listed non-financial firms in Nigeria. The hypotheses were analysed using various panel techniques depending on the outcome of the Hausman test and Lagrangian multiplier test to ensure the reliability of the result.

Table 4: Model one (PCSE)

ROA	Coef.	Std. Err.	Z	P> z
ENVD	-.0048711	.0012086	-4.03	0.000
FA	.0026545	.0012686	2.09	0.036
FS	-.1004684	.065167	-1.54	0.123
LEV	.2417648	.0762823	3.17	0.002
Hausman	2.19			0.7017
Lagrangian	0.01			0.4716

Source: Authors compilation (2025)

Table 5: Model two (PCSE)

ROE	Coef.	Std. Err.	Z	P> z
ENVD	-.0098028	.0025291	-3.88	0.000
FA	.0051825	.0013495	3.84	0.000
FS	-.1406334	.1135639	-1.24	0.216
LEV	.4264135	.1250004	3.14	0.001
Hausman	3.97			0.4106
Lagrangian	0.00			0.4755

Source: Authors compilation (2025)

Table 6: Model Three (pooled regression)

EPS	Coef.	Std. Err.	t	P> t
ENVD	.1696631	.2429492	0.70	0.485
FA	.8791039	.3406617	2.58	0.010
FS	76.68839	18.31198	4.19	0.000
LEV	-43.68898	16.84362	-2.59	0.010
F-statistics	8.57			0.000
R ² = 4%				
Hausman	3.97			0.4106
Lagrangian	0.00			0.4755

Source: Authors compilation (2025)

The test results for the different models are presented in Table 4, 5, 6. Different conditions for estimating panel regression were carried out such as Hausman test and Lagrangian multiplier tests.

In Table 4, the Hausman test was carried out to determine the difference between fixed and random effects. The result showed an insignificant p-value ($P=0.7017$). Therefore, the fixed effect model was rejected. The Lagrangian multiplier test was carried out to decide between random effect and pooled regression. The p value ($p=0.4716$) of the Lagrangian test was insignificant at 5%. Hence, pooled regression is preferable. As a result of the presence of heteroscedasticity in the model, Panel Corrected Standard Error (PCSE) was used in testing the hypotheses.

In Table 5, the Hausman test was carried out to determine the difference between fixed and random effects. The result showed an insignificant p-value ($P=0.4106$). Therefore, the fixed effect model was rejected. The Lagrangian multiplier test was carried out to decide between random effect and pooled regression. The p value ($p=0.4755$) of the Lagrangian test was insignificant at 5%. Hence, pooled regression is preferable. As a result of the presence of heteroscedasticity in the model, PCSE was used in testing the hypotheses.

In Table 6, the Hausman test was carried out to determine the difference between fixed and random effects. The result showed an insignificant p-value ($P=0.4106$). Therefore, the fixed effect model was rejected. The Lagrangian multiplier test was carried out to decide between random effect and pooled regression. The p-value ($p=0.4755$) of the Lagrangian test was insignificant at 5%. Hence, robust pooled regression is preferable. In Table 7, the Hausman test was carried out to determine the difference between fixed and random effects. The result showed an insignificant p-value ($P=0.4106$). Therefore, the fixed effect model was accepted.

The result shows that the coefficient of determination (R^2) in models. The result showed that the R^2 for model three is 4%. This explains that 4% of the variations in the EPS of listed non-financial firms can be explained by environmental disclosure.

H₀₁: Environmental disclosure has no significant effect on return on asset of listed non-financial firms in Nigeria.

The PCSE result shows that environmental disclosure has a significant negative effect on the ROA of listed non-financial firms in Nigeria. Based on this finding, the null hypothesis which states that environmental disclosure has no significant effect of ROA of listed non-financial firms in Nigeria is rejected ($P=0.000$). Therefore, the study concluded that environment disclosure has an inverse effect on ROA. In other words, an increase in environmental disclosure decreases ROA by 0.4%.

This finding infers that the costs associated with collecting, managing, and reporting environmental data can strain financial resources, especially for firms in resource-intensive industries. Compliance with environmental regulations and investments in sustainable practices may divert resources away from core profit-generating activities. Cheng et al. (2022) demonstrated that while environmental disclosures improve a firm's long-term reputation, they

are associated with reduced short-term profitability, particularly for firms in environmentally sensitive industries. In support of this argument, Egbunike and Tarilaye (2017) found that environmental disclosures significantly reduced financial performance in Nigerian listed firms, as measured by ROA, due to the high costs of compliance and reporting.

Bose et al. (2021) highlighted that in emerging economies, the financial burden of environmental investments often outweighs the benefits, leading to a negative correlation with profitability indicators such as ROA.

The result of the control variables depicts that firm age and leverage have a positive effect on ROA. In other words, older firms and levered firm generate more ROA in listed non-financial firms in Nigeria. In contrast, firm size have no significant effect on ROA of listed non-financial firms in Nigeria.

H₀₂: Environmental disclosure has no significant effect on return on equity of listed non-financial firms in Nigeria.

The PCSE result shows that environmental disclosure has a significant negative effect on the ROE of listed non-financial firms in Nigeria. Based on this finding, the null hypothesis which states that environmental disclosure has no significant effect of ROE of listed non-financial firms in Nigeria is rejected ($P=0.000$). Therefore, the study concluded that environment disclosure has an inverse effect on ROE. In other words, an increase in environmental disclosure decreases ROE by 0.9%.

The study findings infers that firms that prioritize environmental sustainability may face higher operational expenses due to investments in cleaner technologies, waste management, and renewable energy sources, which could negatively impact short-term profitability. Companies often incur significant costs to ensure compliance with environmental regulations, sustainability reporting frameworks, and third-party verification.

These costs can reduce profitability and, consequently, the ROE. While some investors value transparency, others might view environmental disclosure as a sign of resource diversion from profit-generating activities. This perception can lead to reduced investor confidence and stock price declines, indirectly affecting ROE. Al-Dosari et al. (2023) found that extensive environmental reporting by firms in the Nordic countries was associated with lower financial performance, as measured by ROE.

Chen et al. (2017) observed a negative relationship between environmental disclosures and ROE in energy-intensive industries, attributing this to the high cost of compliance. Ameer and Othman (2012) and Arleta and Jaroslaw (2022) highlighted that while environmental disclosure enhances long-term firm value, its immediate effect on profitability and ROE can be negative due to upfront costs.

The result of the control variables found that firm age and leverage have a positive effect on ROE. In other words, older firms and levered firm generate more ROE in listed non-financial firms in Nigeria. In contrast, firm size have no significant effect on ROE of listed non-financial firms in Nigeria.

H₀₃: Environmental disclosure has no significant effect on earning per share of listed non-financial firms in Nigeria.

The Pooled regression result shows that environmental disclosure has an insignificant effect on the ESP of listed non-financial firms in Nigeria. Based on this finding, the null hypothesis which states that environmental disclosure has no significant effect of EPS of listed non-financial firms in Nigeria is accepted ($P=0.485$). Therefore, the study concluded that environment disclosure does not affect EPS.

The implication of this findings is that investor investors may prioritize financial metrics such as revenue growth, net profit, or dividend yields over non-financial disclosures like environmental practices when valuing firms. Information asymmetry may also affect the financial outcome of firms. In other words, the quality and comparability of environmental disclosures often vary, making it difficult for investors to interpret their impact on firm value. EPS reflects short-term profitability, whereas the benefits of environmental sustainability are typically long-term. Investors may not immediately perceive the link between environmental disclosures and financial outcomes.

In emerging markets, like Nigeria, environmental disclosure may not yet be a critical factor influencing investment decisions due to lower awareness or limited enforcement of sustainability reporting. Prior empirical studies supports these claims, for example, Hassan and Kouhy (2015) in their study on environmental disclosure and financial performance, the authors found that environmental disclosure often lacks a direct and immediate influence on profitability indicators such as EPS, largely due to the non-financial nature of such reports. Clarkson et al. (2008) and Herenia et al. (2022) emphasized the mixed results of environmental performance on financial metrics and highlighted that the impact is context-dependent.

Rashid and Shamsher (2020) in an analysis of firms in developing markets, the researchers observed that while environmental disclosure is increasing, its influence on profitability indicators like EPS remains weak, suggesting that investors prioritize short-term returns over sustainability efforts. Uwuigbe et al. (2018) examined listed firms in Nigeria, the authors found that environmental reporting had a statistically insignificant relationship with EPS, attributing this to low stakeholder engagement with sustainability disclosures.

The result of the control variables found that firm age and firm size have a positive effect on EPS. In other words, older firms and larger firm increase generate more EPS in listed non-financial firms in Nigeria. In contrast, levered firm has a significant negative effect on EPS of listed non-financial firms in Nigeria.

Post Estimation Test

They are requirements that must be met in order to perform regression analysis. To prevent spurious regression, this is crucial. Heteroscedasticity tests is essential to fullfil the regression criteria. The results of the findings are listed below.

Table 8: Breusch-Pagan/cook-Weisberg test for Heteroscedasticity

Model	Chi ²	Probability
ROA	647.30	0.0000
ROE	370.33	0.0000
EPS	119.71	0.0000

Source: Authors compilation (2025)

Regression analysis relies on the statistical premise that all observations' error terms have a homoscedastic variance. Conversely, mistakes with varied variance are referred to as heteroscedastic. The Breusch-Pagan/Cook-Weisberg test was used to determine whether the estimations' residuals were heteroskedastic. According to the null hypothesis, heteroskedasticity does not exist. According to Table 4.8, the models exhibit heteroskedasticity. Both fixed and random effects were estimated as a result of the null hypothesis being rejected since it was determined to be significant at 5%.

5. CONCLUSION AND RECOMMENDATIONS

The main objective of this study was to examine the effect of environmental disclosure on financial performance of listed non-financial firms in Nigeria from 2012 to 2022. Environmental disclosure was measured using GRI index while financial performance was measured using ROA, ROE and EPS. The controls variables used in the study include firm size, firm age and leverage. The secondary data were analysed using various panel regression techniques. The summary of the findings are: environmental disclosure has a significant negative effect on the ROA of listed non-financial firms in Nigeria. Environmental disclosure has a significant negative effect on the ROE of listed non-financial firms in Nigeria. Environmental disclosure has an insignificant effect on the ESP of listed non-financial firms in Nigeria. Firm age, firms size and leverage significantly affects financial performance of listed non-financial firms in Nigeria. Based on the conclusion, the following recommendation are put forward:

- i. Management of non-financial firms should focus on initiatives that provide both environmental and financial benefits, such as green technology or renewable energy solutions, which can reduce long-term costs and generate goodwill among stakeholders.
- ii. The management of non-financial firms should communicate the long-term benefits of environmental initiatives clearly to investors, employees, and other stakeholders. Highlight how sustainability efforts contribute to competitive advantage and future profitability.
- iii. Non-financial firms can incorporate environmental performance indicators directly into financial reports to highlight their relationship with profitability and value creation.
- iv. Firms should treat environmental initiatives and disclosure as strategic investments rather than compliance obligations. By integrating environmental sustainability into core business operations, firms can achieve cost efficiencies, enhance brand reputation, and attract environmentally conscious investors.

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