Innovations

Effect of Firm Characteristics on Environmental Disclosure of Listed Non-Financial Companies in Nigeria

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Abstract: *As a result of stakeholders increased demand for information about firms' efforts in preserving the environment for the current generation and generations to come, companies have keyed into disclosing environmental information even though this form of disclosure is not mandatory. This paper examined the effect of firm characteristics on environmental disclosure of listed non-financial companies in Nigeria. Ex-post facto design was adopted and secondary data sourced from forty-five (45) out of a population of one hundred and eight (108) listed non-financial firms in Nigeria from 2013-2022. Firm characteristics (independent variable) was proxied using firm age, firm size, profitability, leverage and Institutional ownership while environmental disclosure (dependent variable) was measured using environmental disclosure index (EDI). Series of diagnostic tests such as skewness and kurtosis, Shapiro-Wilk test, histogram of residuals, pnorm and qnorm were used to test normality of the data while correlation matrix and VIF statistics were performed to test collinearity and multicollinearity issues amongst the independent variables. Link test was used to test for model misspecification while Hausman test was conducted to choose between fixed and random effects model to use. Following these procedures, the fixed effect model was adopted for the analysis. Result shows that firm size, firm age and profitability have a positive and significant effect on*

environmental disclosure of the studied companies. On the other hand, leverage has a negative and insignificant effect on environmental disclosure of sampled companies while institutional ownership has a positive but insignificant effect on the environmental disclosure of the studied companies. The study concludes that firm characteristics drives environmental disclosure of listed non-financial companies in Nigeria. The study recommended that stakeholders should demand environmental accountability from companies and enforce this accountability by punishing the companies that are not environmentally sensitive. This punishment can be in form of non-patronage as well as withdrawal of investment from and services from companies that are not environmentally accountable. When this is done, Management of listed non-financial companies in Nigeria will take environmentaldisclosure seriously so as to earn legitimacy status from stakeholders.

Keywords: *Size. Age, Leverage, Profitability, Ownership Structure, Environmental Disclosure*

1.   Introduction

Companies'world over engages in various activities ranging from exploration and production, refining and petrochemicals, marketing and distribution, building and construction, packaging materials, manufacturing, agriculture,and a host of others to drive economic growth, provide employment opportunities and contributes to the overall development of worldeconomies.However, corporate sector activities have resulted in massive environmental pollution, global warming, deforestation and desertification that requires businesses to perform environmental impact assessments and publicly disclose the results in order to create a sustainable environment that is suitable for the efficient running of human and corporate organisations (Votsi, Kallimanis, &Pantis, 2017).

To be sustainable, companies have a responsibility to treat and preserve the environment in a responsible manner. This should be followed by a disclosure either in their financial statement or as a stand-alone report to enlighten stakeholders about their environmental practices. Although, environmental regulations, pressure group activities and consumer awareness are all weak in developing countries like Nigeria (Ezeagba, Racheal, &Chiamaka, 2017), some Nigerian companies are making commendable efforts in terms of environmentally sound practices and disclosure to mitigate the harm they cause to the environment due to their activities. This is why Suleiman, Abdullah, and Fatima (2014) emphasized that the environment is an asset to the firm hence the need for companies to manage it well.

As an asset, companies are expected to prudently manage and disclose their effort in improving/preserving the environment to stakeholders (Kabiru 2020). Many companies in Nigeria disclose environmental information alongside

statutory disclosures to remain legitimate and reap the benefit of a legitimate firm (which include easy access to capital, issue of shares, security of the company's properties by the host community and high patronage of the company's products and/or services) even though this form of disclosure is voluntary and has some costs attached to it.By this, it means it is a charge against profit in an accounting period. Our concern is therefore drawn to what triggers this form of disclosure by firms even though it is voluntary. It is in view of the above that this paper sets to examine whether or not firm characteristics affect environmental disclosure of listed non-financial firms in Nigeria from 2013 to 2022.

To achieve this objective, the following hypotheses were formulated in null form:

$H0_1$:Firm size has no significant effect on the environmental disclosure of listed non-financial   firms in Nigeria.

$H0_2$:Firm age does not significantly affect environmental disclosure of listed non-financial   firms in Nigeria.

$H0_3$:Firm profitability has no significant effect on the environmental disclosure of listed non-   financial firms   in Nigeria.

$H0_4$:Leverage does not significantly affect environmental disclosure of listed non-financial   firms in Nigeria.

$H0_5$:Institutional ownership has no significant effect on environmental disclosure of listed   non-financial firms in Nigeria.
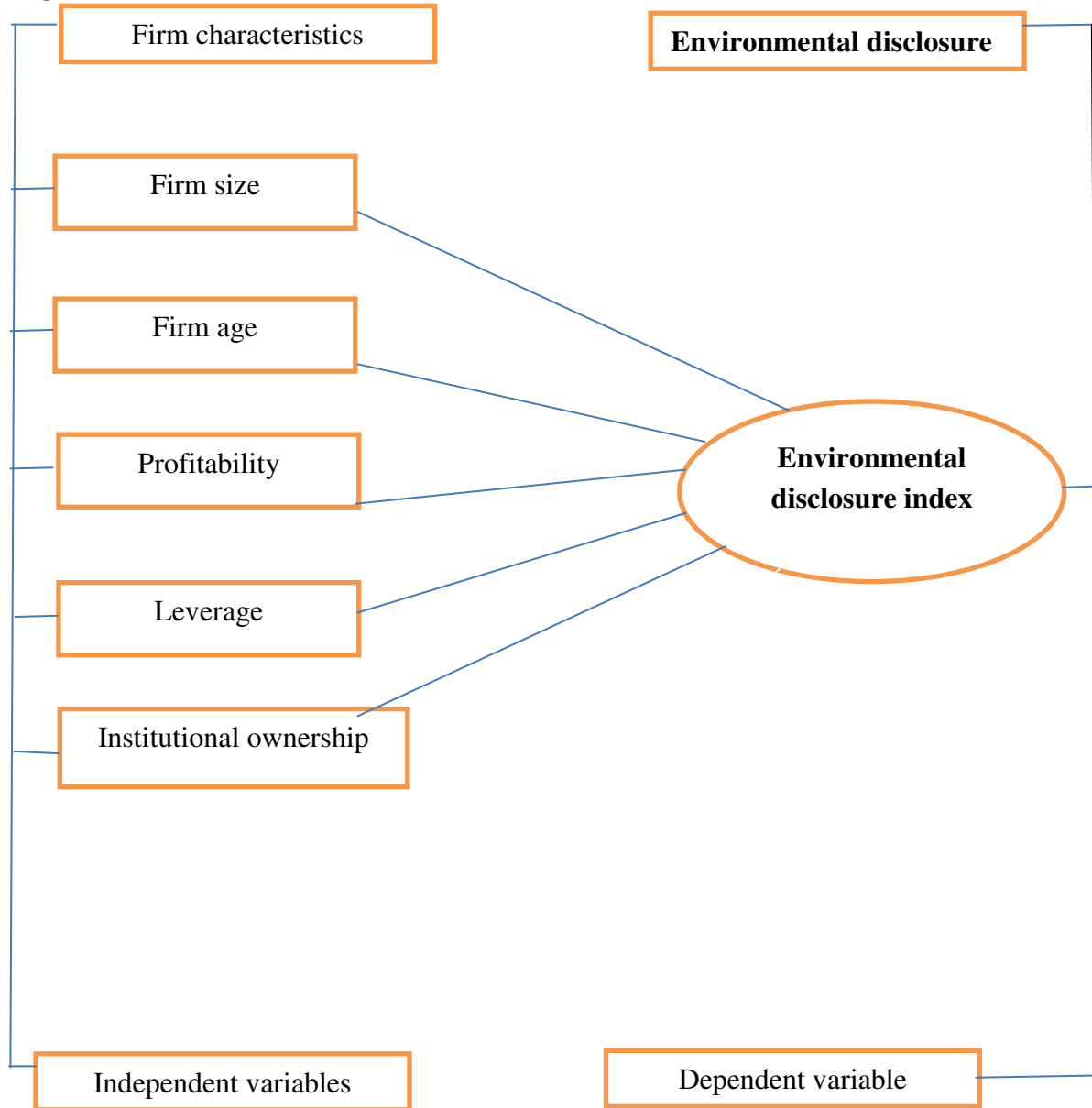
2. Review of Related Literature

This section of the paper housed conceptual framework, theoretical review and empirical studies

2.1 Conceptual Framework

This section houses discussion on the concepts of firm characteristics and environmental disclosure as seen thus:

Figure 1.1: Conceptual framework

Source: Researchers compilation, 2024

Figure 1.1 presents the conceptual framework of the study. The figure shows the nexus between the dependent variable (measured by environmental disclosure index and the independent variable (firm characteristics) measured by firm size, firm age, profitability, leverage and institutional ownership. From the framework, it can be deduced that the independent variables are expected to have a link (an effect) on the dependent variable. That is, a large firm should be more inclined to disclose environmental information thana small firm.Also, an older firm should be more willing to disclose environmental information than a younger one. A profitable firm should be more concerned about her reputation thereby disclosing more environment information than a firm that is operating at a loss. On the other hand, firms that are highly geared should be more concerned about their reputation (as such, leverage may positively or negatively affect

environmental disclosure) and the caliber of people that owns a firm should also determine the nature of information the firm will disclose to stakeholders.

2.1.1 Firm Characteristics

Firm characteristics is used most times interchangeably with firm attributes. Three criteria can be used to assess a company's resources and goals: the company's structure, its position in its market, and its access to money (Kisengo&Kombo, 2012). Firm size, age, profitability, and ownership are all examples of structural characteristics (Kisengo&Kombo, 2012). In addition, industry type, environmental uncertainty, and market environment are examples of factors associated with the market, whereas liquidity and capital intensity are examples of variables associated with capital.

To Zayol, Akpa, Tsegba and Gberindyer (2021), firm characteristics are the attributes that qualifies a firm to be referred to as an independent entity that creates utility. Firm attributes are divided into two basic groups: corporate performance attributes and corporate structural attributes. The corporate performance attributes include corporate growth and profitability, while the corporate structural attributes include corporate size, corporate leverage, corporate age and management efficiency. Firm characteristics include firm size, leverage, liquidity, sales growth, asset expansion, and turnover. Other variables that separate one firm from another include ownership structure, board qualifications, company age, dividend distribution, profitability, capital market access, and development potential. Firm characteristics also include industry type, geographic location, business style, corporate governance strategy, and any other element that distinguishes an organization.

2.1.1.1   Firm Size

Firm size connotes a company's appropriate rate and scope of expansion. Companies may have to increase their manufacturing capacity, market share or even geographical presence in order to survive in the face of fierce competition and rapid change. The size of a firm may have a notable impact on its environmental disclosure practices shaping the extent and nature of its reporting. A firm's size whether measured by total assets, revenue, market capitalization or even employee count provides insight into the scope and capabilities of its operations which in turn influence the depth of its environmental disclosure.

Research shows that firm size has a significant positive correlation with both the quantity and quality of environmental disclosure (Lee, 2017; Brammer, 2008). Larger firms tend to provide more comprehensive and detailed environmental information, potentially due to their greater resources and capacity for environmental management. This trend is observed across different industries and countries, suggesting a universal relationship between firm size and environmental disclosure.

2.1.1.2 Firm Age

Firm age describes the period of a company's existence. Age plays a significant role in shaping a company's maturity, experience and development over time. Young firms devote more time and resources in setting up operations, expanding clientele and becoming profitable while older firms go through various growth stages such as market expansion and product diversification. As a firm grows older, it accumulates organizational knowledge, learn about its industry, market dynamics and client preferences. The relationship between a firm's age and its environmental disclosure is complex and varies across different studies. Abdo (2012) found that the age of a company is insignificant and negatively related to the level of environmental disclosure, while Cormier and Magnan(2005) identified firm age as a determinant of environmental disclosure in large German firms.

2.1.1.3 Profitability

Profitability is the ability of a firm to manage her assets. Going by agency theory, profitability can be conceived to be a measure of shareholders satisfaction most especially when return on equity is used as a measure of profitability (Ebrahim, Soliman&Rezk 2015). In the same light, Kwanum, Iorpev and Azende (2021) conceptualized profitability as the ability of a firm to make profit.

Previous research shows positive, negative and no relationship between profitability and environmental disclosure of firms. The positive relationship can be due to two reasons; firms with high profit may tend to increase environmental disclosure to improve their public image as well as attract new investors (De Villiers and Van, 2011). On the other hand, firms with high profits may have better ability to pay for extra costs of environmentaldisclosure (Branner and Pavelin, 2008).

2.1.1.4 Leverage

Leverage connotes the use of debt or borrowed capital to increase the potential return on an investment or to achieve a financial goal. It involves using a small amount of one's own capital to control a larger asset or investment with the hope of generating returns that exceed the cost of borrowing. Leverage can amplify both gains and losses, making it a double-edged sword. While it can increase profit, it can also increase default risk and bankruptcy. Excessive leverage can result to financial distress hence the need to judiciously use leverage. A high leveraged company relies greatly on the trust and financial support of creditors. For a company to continue gaining creditors trust, the management of the company must disclose high profits. For profits of a company to be high, the company must minimize cost. One way of cost reduction is by reducing the volume of information disclosed to stakeholders.

Gao (2011) suggested that lower toxics emissions are linked to higher leverage and voluntary disclosure. Andrikopoulos (2013) identified a significant association between financial leverage and the breadth of environmental disclosure.

2.1.1.5 Institutional Ownership

Institutional ownership is a term that refers to the percentage of a company's stock held by large entities such as mutual or pension funds, insurance companies, investment firms, private foundations as well as endowments. These entities have the potentials to significantly affect how a company is manned.

2.1.2 Environmental Disclosure

Uwalomwa (2014) defines environmental disclosure as the process of communicating the social and environmental effects of organisations' economic actions to particular interest groups within society. The purpose of Environmental Disclosure is to increase openness between businesses and their stakeholders and to ensure that organisations are held accountable for the environmental impacts of their operations and supply relevant data to those who need it to make informed decisions.

According to Dibia and Onwuchekwa (2015), the purpose of environmental accounting is to identify, allocate, and evaluate material streams and their corresponding cash flows in order to gain insight into environmental consequences and associated financial implications. The premise that corporations have social duties beyond the maximisation of shareholder value is central to environmental accounting, as underlined by De Villiers (1999). This concept outlines the responsibility of the firm's decision makers to make choices and act in approaches that recognise the relationship between the firm and the society, which is essential for maintaining the firm's commitment to ethical behaviour and making contributions to environmental sustainability while making a profit.

When a company reports on the environmental effects of her operations, whether as an appendix to its annual report or as a distinct document, this is known as environmental information disclosures (Belal, 1999). The report details the company's revenue-generating activities, including how much money is spent on environmental issues, the environmental benefits of its products, and other vital information (Ajibolade&Uwalomwa, 2013). Ajibolade and Uwalomwa (2013) elaborate on how environmental information releases make a company's environmental information accessible to the public and government. These disclosures serve the greater benefit of society by encouraging firms to prioritise environmental sustainability, which improves the company's standing with its constituents.

According to Hossain, Islam, and Andrew (2006), companies can do more to ensure environmental compliance by disclosing data about the impacts of their operations, the measures they have taken to mitigate those impacts, and the results of those efforts.

2.2 Theoretical Review

This paper reviews legitimacy and stakeholders' theories as they relate to environmental disclosure.

2.2.1 Legitimacy Theory

Organisational legitimacy, initially popularised by Dowling and Pfeffer in 1975, is the theoretical foundation for legitimacy theory. Based on this theory, businesses have implicit or explicit agreements with society (Shocker &Sethi, 1974). The moral obligation of a business is conveyed by the demands of societywhich are not constant but change with time (Islam & Craig, 2008). The nexus between legitimacy theory and this study lies in the relationship between businesses and their customers. If a company's norm system incorporates social systems with compatible qualities, then the firm is legitimate(Dowling &Pfeffer 1975). To enhance their standing among their constituents, firms should prioritise environmental preservation initiatives and disclosure of same as proposed by legitimacy theory. Companies' interactions with the public are the primary subject of legitimacy theory.

According to Deegan and Jeffry (2006), a company is seen as been legitimate if it satisfies the needs of the entire community. That is, if society believes that a company is endangering their lives through their operations, the company faces serious risks to its continued existence. On the other hand, if the company carryout activities to restore the damage their activities have caused and report same, the society in return will confer legitimacy status on the firm. This can lead to more patronage of the firm's product and services, increase in their supply of labour and financial capital to the business.

2.2.2 Stakeholder Theory

Organisations have different types of interested parties (stakeholders) who are either directly or indirectly impacted by their actions (Sweeney and Coughlan in 2008). Anyone who has a vested interest in the success of an institution is considered a stakeholder (Bassey, Sunday, &Okon, 2013). According to this notion, managers have a wide range of stakeholders to satisfy for a firm to thrive.

For a company to succeed, it must do more than simply maximising profits for shareholders; it must also take steps to ensure that its operations are sustainable from the perspectives of its varying stakeholders (employees, suppliers,

customers, communities, government, trade associations, regulatory authorities, and the media).

This paper is anchored on the stakeholder and legitimacy theories because, the stakeholders' theory inspires managers to implement the kinds of long-term strategies that non-financial stakeholders value highly. The stakeholder theory does this by segmenting society into several interest groups (or "stakeholders") and ensure a balance between competing factions.when these measures yield positive results, (that is, if the interests of the varying stakeholders including those of the society concerning the environment are taken into consideration) a firm is adjudged legitimacy status. Although there are instances in which one stakeholder group benefits at the expense of another, stakeholder theory does not give priority to any particular stakeholder group. When management fails to maintain a healthy balance between various stakeholder groups, the firm's very existence could be at risk.

2.3   Empirical Studies

This section reviews extant literature on the effect of firm characteristics on environmental disclosure of listed firms.

Salawa (2023) assessed the effect of different company characteristics on environmental disclosure dedication in Nigeria. The study used the Kinder Lyndenberg Domini (KLD) indices to evaluate companys' dedication to environmental disclosure (ED). The work was anchored on legitimacy and stakeholders' theories. Data was collected for nine years (2012-2020). Was estimated using ordinary least squares and the results were considered accurate. The study demonstrates that ED is significantly and positively associated to firm size and foreign company affiliation. Also, firm commitment efforts and ED were not significantly impacted by board size, financial performance and leverage. Even though the study used majorly the variables of the present study, the present study used all listed companies in Nigeria.

Nurnika and Setianingtyas (2023) analysed the effect of ownership structure on social and environmental disclosure of Indonesian companies. Data were sourced from 52 companies in the mining and real estate as well as building construction sectors and analyse using multiple linear regression. Results reveals that institutional ownership and managerial ownership have a significant effect on social and environmental disclosure while large shareholder structure has an insignificant effect on social and environmental disclosure.

Jubaedah and Setiawan (2023) assessed the effect of the sub-variables of ownership structure: managerial ownership, foreign ownership, dispersed ownership and block ownership on social and environmental disclosure. Multiple linear regression was used as the analytical technique. Findings indicate that manufacturing firms in Indonesia have on average very little information about

their impact on the environment. Also, that social and environmental disclosures are affected by management ownership, foreign ownership and block ownership but has no substantial effect on dispersed ownership. The study though similar with the present study, differs in terms of location.

Ekpulu and Iyoha (2023) examined the nexus between company characteristics and environmental disclosure. Ex post facto design was adopted. A random sample of 23 environmentally sensitive companies and environmentally non sensitive companies was used. The Double-Hurdle method was employed and the result show that, financial leverage is a strong determinant of disclosure but does not determine the intensity of disclosure while firm size and profitability are significant determinants of both the decision to disclose and the extent of disclosure.

Chariri, Januarti and Yuetta (2023) examined the impact of business size, industry, profitability and ISO certification on the disclosure of carbon emissions. The population was 31 enterprises that are included in the Nordic Carbon Disclosure Project (CDP). Multiple regression was used to analyse the data collected and the result shows that firm size and profitability have a favourable impact on carbon emission disclosure. Meanwhile, the industry and ISO certification had little bearing on the disclosure of carbon emission of the studied firms. Apart from the need to replicate this study in Nigeria, there is the need to conduct a study using more themes of environmental disclosure to validate the findings.

Moshud, Sani and Olanrewaju(2021) assessed the impact of firm size on environmental disclosure of quoted firms in Nigeria from 2012 – 2016. The study made use of cross-sectional design focusing on a sample of 82 firms from a population of 176 listed firms in Nigeria. Binary regression technique was used for analysis and the result reveals that, size of quoted Nigerian firms has a negative relationship with environmental disclosure even though the effect is insignificant. The study used a large sample which is commendable but a time gap is created since the data used was from 2012 to 2016 hence the need for this study.

Zayol, Akpa, Tsegba and Gberindyer (2021) examined the relationship between firm characteristics and corporate environmental disclosure by Nigerian less-sensitive listed companies from 2009 – 2018. Ex post facto design was used. Secondary data was sourced from the sampled firms and analysed using panel regression. Result show that, ED by less-sensitive listed companies in Nigeria is low but increased steadily over the study period. In addition, age of a firm and leverage are positively and significantly related to the level of corporate environmental disclosure by less-sensitive listed companies in Nigeria while firm

size and size of audit firm are positive but insignificantly related to environmental disclosure.

Moruff, Salisu, Mohammed and garba (2021) investigated the effect of specific attributes of oil and gas firms on ED. Secondary data collected from 2012 – 2018 were utilized. The hypotheses were tested using GLS. Result shows a positive and significant relationship between board composition, financial leverage, existence of foreign directors on the board and ED while firm age and financial performance have an insignificant relationship with ED.

3. Methodology

The ex-post facto method was adopted for this investigation. The method was deemed appropriate since the researchers had no control over the study variables.The population of the study comprised of 108 listed non-financial companies in Nigeria.Secondary data was sourced from 45 listed non-financial companies in Nigeria that made the sample. The regression model used by Gbadebo (2022) is adapted to incorporate the study's variables as seen below:

EDI= f(FSIZE, FAGE, PROF, LEV,INOWS)

The econometric specification is as follows:

$EDI_{it} = \beta_0 + \beta_1 FSIZE_{it} + \beta_2 FAGE_{it} + \beta_3 PROF_{it} + \beta_4 LEV_{it} + \beta_5 INOWS_{it} + e_{it}$

Where:

β_0 = Intercept of X variable of company

β_1-β_5 = Coefficients of explanatory variables indicating their relationships to the observable variable.

EDI   = Environmental disclosure index

FSIZE = Firm size

FAGE = Firm age

PROF = Profitability

LEV = Leverage

INOWS =Institutional Ownership

e   = Error term

it = Firm i at time t

Table 3.1: Operational Measurement of Variables

Variables	Acronym	Formula	Previous Studies
Environmental Disclosure Index	EDI	If a firm report on any of the environmental disclosureitems (water, energy, waste management, biodiversity, emission and environmental management system), it is termed 'occurrence' and a value of 1 is assigned otherwise, 0. If reporting is made by mere mentioning, it is tagged 'quality' and 2 is assigned but if the amount of the item is given, 3 is assigned. The sum of the 'quality' is divided by the 'occurrence' to give the index.	Kwanum, Azende&Iorpev (2020)
Firm Size	FSIZE	Natural logarithm of total assets at the end of fiscal year	Atang&Eyisi (2020), Aliyu (2019)
Firm Age	FAGE	Year of financial report minus year of founding the firm	Gbadebo (2022)
Profitability	PROF	Return on assets	Ivungu, Iorpev&Ogira (2020)
Leverage	LEV	Total debts/Total assets	Orajekwe&Ogbobo (2023)
Institutional Ownership	INSOWS	Percentage of a company's stock held by large entities	Juo-Lien, Hsing-Hwa& Wan-Ting (2012)

4. Results and Discussion of Findings

4.1 Descriptive Statistics

The descriptive statistics of the dataset from the sampled listed firms are presented in table 4.1.

Table 4.1: Descriptive Statistics of the Variables

Variable	Obs	Mean	StdDev	Min	Max
EDI	450	0.4038	0.2747	0.01	0.9
AGE	450	43.8333	20.2673	3	108
SIZE	450	7.3784	1.0095	5.31	10.18
ROA	450	3.7170	17.4063	-85.02	176.26
LEV	450	0.5756	0.1987	0.0397	1.53
INSOWS	450	0.7336	0.0928	0.5	0.98

Source: Compiled by the researcher, 2024.

Table 4.1 presents the descriptive statistics of the study variables showing the number of observations, mean values, standard deviation, minimum and maximum values of the data set. The paper made use of data obtained from 45 listed companies for 10 years giving 450number of observations.

Environmental disclosure index (EDI) revealed a mean, standard deviation, minimum and maximum values of 0.4038, 0.2747, 0.01 and 0.9 respectively. This means that, during the period of investigation, the firms reported on average 0.4038 environmental issues with variations to the tune of 0.2747. This implies that, environmental issues were moderately reported by the firms during the period. The results also show a minimum reporting of 0.01 and a maximum of 0.9 environmental issues during the period.

For the independent variables, age (AGE) has a mean of 43.8 years. This implies that, on average, each of the studied firm is 44 years old. AGE has a deviation from the mean of 20.26 years. Also, the youngest company is 3 years while the oldest is 108 years old.

Size has a mean score of 7.3784. This implies that the companies under investigation are not infant companies hence should disclose more environmental issues. Size has a standard deviation of 1.009. the minimum and maximum values of size are 5.31 and 10.18 respectively.

The mean value of return on assets (ROA) is 3.7170 while the standard deviation is 17.4063. The standard deviation of ROA is higher than the mean value. This suggests that majority of the companies under consideration incurred losses during the study period. The minimum and maximum values are -85.02 and 176.26 respectively.

Leverage (LEV) has a mean value of 0.5756 and a standard deviation of 0.1987. The minimum and maximum values of LEV remain 0.0397 and 1.5342

respectively. This implies that the companies are moderately levered thereby paving the way for enhancing environmental disclosure.

Institutional ownership (INSOWS) has a mean value of 0.7336. The standard deviation of obtaining this mean value is 0.9282. The minimum and maximum values are 0.5 and 0.98 respectively. It implies that the sampled companies are majorly owned by institutions which is a good omen for improved environmental disclosure.

4.1.2.1 Data normality tests

To ascertain the normality of data, the histogram of residuals, pnormal distribution and qnormal distribution were carried out and the results are as presented.

Figure 4.1: Histogram of residuals
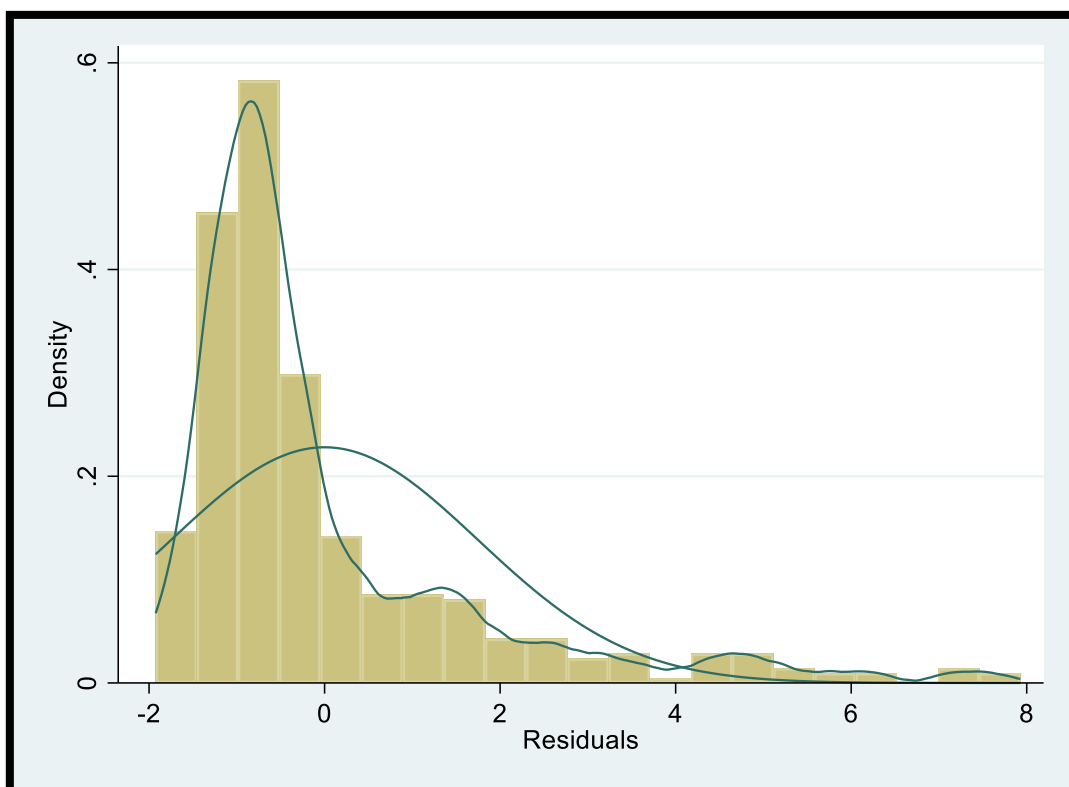
Source: STATA Output 2024

From figure 1.1, it can be seen thatthe highest point of the histogram falls within the region of the uniform distribution of the data set implying the uniformity of the residuals.
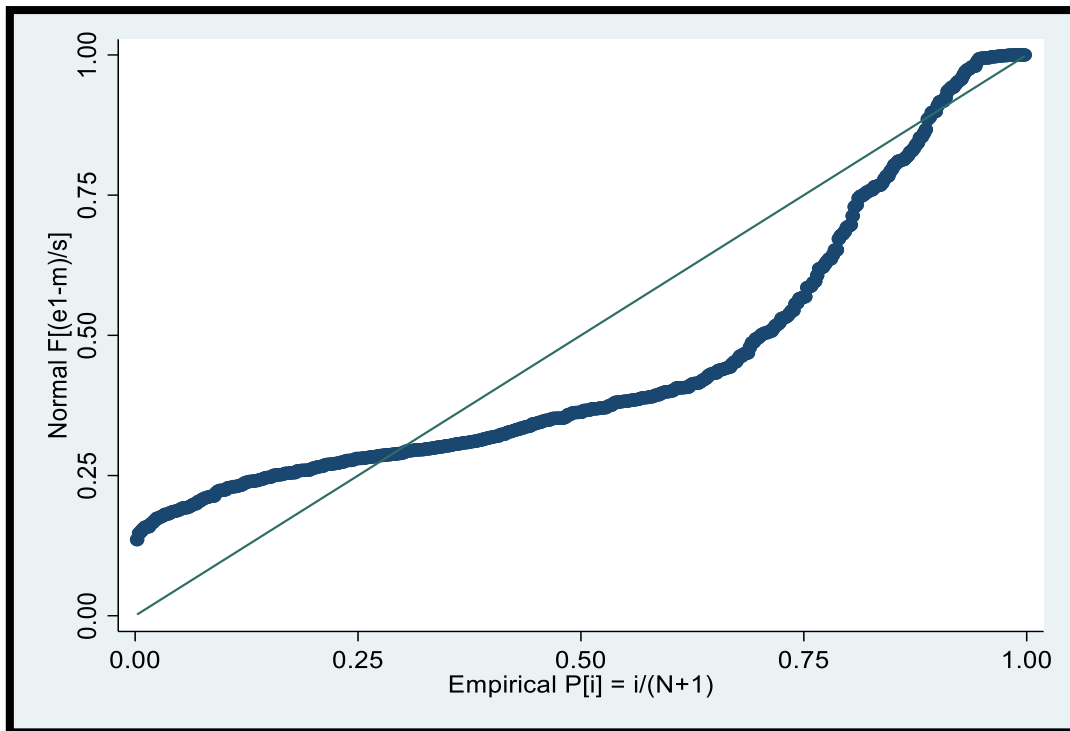
Figure 4.2: Probability normal distribution

From figure 4.2, the distribution of the probabilities aligns with the straight line where the meeting point is almost at the middle of the line of best fit (0.50). This shows that the residuals and of course the data set used are normally distributed.
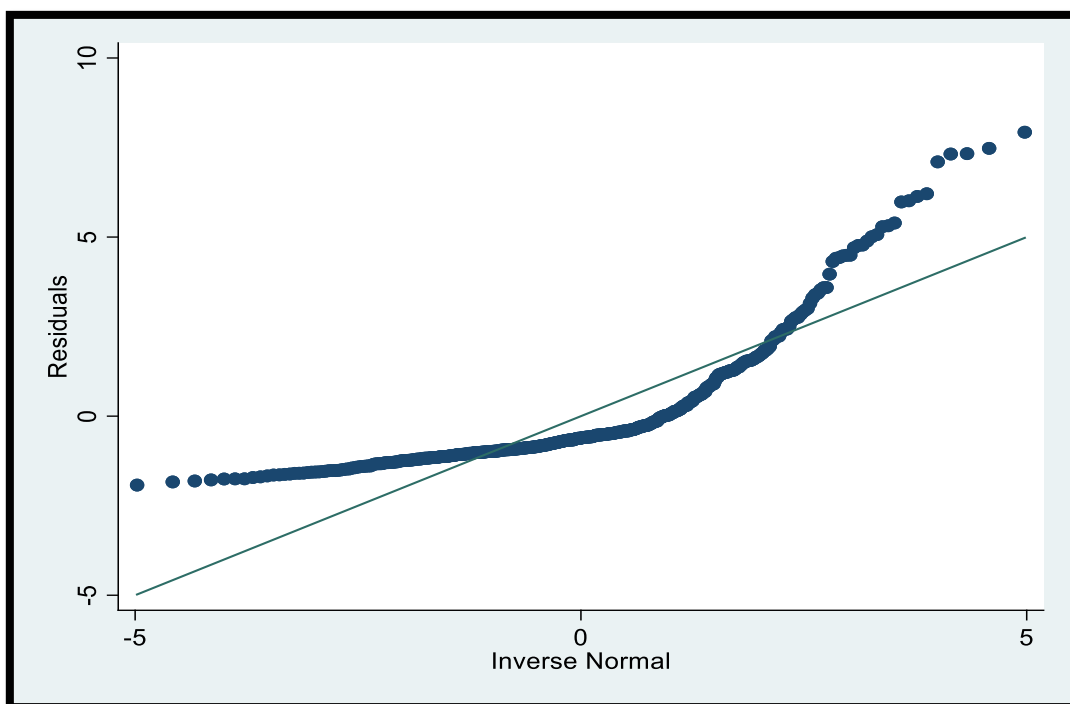

Figure 4.3: Quartile normal distribution

Figure 4.3 shows that the residuals of the data set fall within the exact quartile distribution necessary to help in ascertaining the normality of the data residual and hence, the normality of the data. This is because, the intercept of the quartile and line of best fit occurs at 0.

4.2.2.2 Collinearity and Multicollinearity tests

These tests were conducted to ascertain whether the data set used (especially the independent variables) are correlated such that the study's result can be affected. The result is presented below:

Table 4.3: Correlation Matrix

Variable	AGE	SIZE	ROA	LEV	INSOWS
AGE	1.0000				
SIZE	0.1033	1.0000			
ROA	-0.0517	0.0715	1.0000		
LEV	0.0756	0.0491	-0.1261	1.0000	
INSOWS	0.2958	0.0879	0.1033	-0.1068	1.0000

Source: STATA output, 2024.

Result of Table 4.3 showslowcorrelation coefficients for all the independent variables. This connotes absence of collinearity issues among the variables.

Table 4.4   VIF Test for Multicollinearity

Variable	VIF	TV
INSOWS	1.13	0.881999
AGE	1.12	0.890056
LEV	1.04	0.961398
ROA	1.04	0.964869
SIZE	1.02	0.977485
Mean VIF	1.07	

Source: STATA output, 2024.

VIF values above 5 are said be a cause of concern (Gujirati and Sangheetha, 2007). Since none of the values of VIF is up to 5, they are considered not harmful to the result.

4.2.2.3 Heteroskedasticity test

To further examine the homogeneity of the error terms in the regression model, Breusch and Pagan test for heterokedasticity was performed on the transformed

data before applying the actual regression analysis technique. The result is as presented:

Table 4.5: Test for Heteroskedasticity

Chi2(1)	9.48
Prob>chi2	0.0021

Source: STATA output, 2024.

Result of Table 4.5 signals heteroskedasticity issue. To mitigate this, the regression model was run with a variation of the robust standard error version to neutralize the consequences of the error terms on the outcome of the result.

4.2.2.4 Model Specification

Table 4.6: Link Test

Hart square	0.299

Source: STATA output, 2024.

Result of table 4.6, shows that the hart square value of 0.299 is greater than 0.05 implying that the model is not misspecified.

4.2.2.5 Hausman Test

Table 4.7: Result of the Hausman test

Chi2(5)	24.83
Prob>chi2	0.0002

Source: STATA output, 2024.

From table 4.7, the prob>chi2 of 0.0002 is less than 0.05. Therefore, the fixed effect regression model was used.

4.2.3 Regression Result

Table 4.8: Fixed effects result

EDI	Coefficient	Robust Std Error	z	Prob>/z/
AGE	0.0501	0.022037	2.28	0.028
LEV	-0.0615	0.0337957	-1.82	0.076
ROA	0.1120	0.0269702	4.15	0.000
SIZE	0.1673	0.0204582	8.18	0.000
INSOWS	0.1190	0.063174	1.88	0.066
Constant	2.8018	0.327139	8.56	0.000
Obs	450			
R-square	0.1537			
Prob>chi2	0.0000			

Source: STATA output, 2024.

Table 4.9 presents the result of the fixed effect regression of the study. It shows that there are 450 firm-year observations which is not too small to use a regression technique since there are more than 30 observations. The R^2 of 0.1537

implies that 15.37% of variations in environmental disclosure of the sampled listed companies are attributable to firm characteristics while 84.63% of such variations are caused by factors not captured in this study. The prob>chi2 value of 0.0000 indicates that the fixed effect regression model used to analyse this study is fit at a significance level of 5%, thus can provide reliable result.

From the coefficients of the fixed regression equation, the table shows that a year increase in age will result to a 5.01% increase in the disclosure of environmental information of the sampled listed companies in Nigeria. This implies that age is capable of increasing disclosure of environmental information.

The table also shows that a unit increase in leverage will lead to a 6.15% reduction in the disclosure of environmental information of the sampled listed companies in Nigeria. This implies that leverage has the tendency of reducing environmental information disclosure as more and more debts will discourage the companies from carrying out environmental-related investments.

On return on assets, a naira increase in profit will lead to a 11.2% increase in disclosure of environmental issues of listed. This suggests that profitability has the potentials of boosting environmental disclosure. This may be possible due to the fact that, since disclosure has cost attached to it, firms that are doing well are more likely to disclose more information.

A unit increase in the size of the sampled listed companies will lead to16.73 increase in the disclosure of environmental issues. This suggests that as the companies become bigger, they engage more in activities that can improve their relationship with host communities and can meet the interests of their diverse stakeholders better than when they are smaller in size.

On institutional ownership, the result reveals that a unit increase in the number of shares held by institutions will lead to 11.9% increase in environmental disclosure of the sampled listed companies in Nigeria. This suggests that institutions are informed about the need to preserve the environment and disclose same hence companies they held more shares are likely to disclose more on environmental issues.

However, if these attributes are held constant (not used), other variables outside this study are capable of influencing environmental information disclosure by a whooping 280.18% thereby confirming the low predictive power of this model (15.37%).

4.3 Test of Hypotheses

The hypotheses stated in their null forms in chapter one are tested in this section.

Independent Variable	P-Values	Significant or insignificant @ 5%	Remarks
SIZE	0.000	Significant	Reject Null Hypothesis
AGE	0.028	Significant	Reject Null Hypothesis
ROA	0.000	Significant	Reject Null Hypothesis
LEV	0.076	Insignificant	Accept Null Hypothesis
INSOWS	0.066	Insignificant	Accept Null Hypothesis

4.4 Discussion of Findings

This section discusses the findings of the study in line with the tested hypotheses as follows:

4.4.1 Firm Size and Environmental Disclosure

The test of hypothesis one which centered on the effect of firm size on environmental disclosure of listed firms in Nigeria revealed that firm size has a significant positive effect on environmental disclosure of listed companies in Nigeria. The positive effect of firm size on environmental disclosure in this study corresponds with the study conducted by Salawa (2023), Chariri, Januarti and Yuetta (2023) However, the result of this study disagrees with that of Olanrewaju (2021) who found a negative effect of size on environmental disclosure of firms. The result also revealed a significant effect of firm size on environmental disclosure. This result agrees with that of Salawa (2023), Ekpulu and Iyoha (2023) who also revealed that firm size has a significant effect on environmental disclosure of firms. This means that, the bigger a firm grows in size, the likelihood that it will disclose more environmental issues and the more it intends to show the highest level of accountability, be more responsible, transparent and environmentally sensitive to enjoy legitimacy from the stakeholders. The result disagrees with the findings of Zayol, Akpa, Tsegba and Gberinyer (2021) who found that size of a firm has no significant effect on environmental disclosure.

4.4.2 Firm Age and Environmental Disclosure

The test of hypothesis two which centered on the effect of firm age on environmental disclosure of listed companies in Nigeria reveals that firm age has a significant positive effect on environmental disclosure of listed companies in Nigeria. The positive effect obtained in this study corresponds with Zayole'tal (2021). The positive effect of firm age on environmental disclosure could be explained to suggest that when companies get older, they are more experienced and values their relationship (legitimacy theory) with the stakeholders the more

hence the need to disclose more environmental issues. The significant nature of the effect suggests that firm age is very important and a necessary factor that influences environmental disclosure of listed firms in Nigeria. Zayole'tal (2021) reported significant effect of firm age on environmental disclosurewhileMoruff, Salisu, Mohammed and Garba (2021)found that age has an insignificant effect on environmental disclosure of firms.

4.4.3 Firm Profitability and Environmental Disclosure

The third test of hypothesis which was on the effect of firm profitability on environmental disclosure of listed companies in Nigeria reveals that the effect is positively significant. The positive effect of firm profitability on environmental disclosure clearly suggests that since disclosure is an expense to the company, profitable companies has the potentials to disclose more environmental issues since the financial capability is there to cater for more disclosures. The positive effect of firm profitability on environmental disclosure is supported in literature by the Adekanmi (2022) while Kabirue'tal shows a negative result contrary to our findings. The significant effect of firm profitability on environmental disclosure agrees with the studies of Ekpulu and Iyoha (2023). This position disagrees with the findings of Salawa (2023) and Moruffe'tal (2021) who found that firm profitability has an insignificant effect on environmental disclosure of firms.

4.4.4 Leverage and Environmental Disclosure

The fourth hypothesis was on the effect of leverage on environmental disclosure of listed companies in Nigeria. This result of the test revealed a negative and an insignificant effect. The negative effect of this result is in contrast with studies of Zayole'tal (2022) and Moruffe''tal(2021). The negative effect of leverage on environmental disclosure may explain why managers of highly levered companies may not be willing to go into extra expenditure while paying the principal and interest on loans they borrow despite the tax deductibility (tax shield) effect of debt. This therefore suggests that the higher the debt profile a company has the less it undertakes social investments. The study also reveals that leverage has an insignificant effect on environmental disclosure. This position is in line with Salawa (2023). On the contrary, Zayole'tal (2021)andMoruffe''tal (2021) found a significant effect of leverage on environmental disclosure. This result suggests that since leverage is negatively related to environmental disclosure, it is not very relevant in influencing the company's decision to embark on extra spending. This is expected to refocus company managers and discipline them to engage in expenditures that can be value additive to the companies they manage.

4.4.5 Institutional Ownership Structure and Environmental Disclosure

The last hypothesis was on the effect of institutional ownership on environmental disclosure of listed non-financial firms in Nigeria. The result of the test reveals

that the effect is positively insignificant. A prior study that reported insignificant result is Yossi and Tri (2018) while Jubaedah and Setiawan (2023) reported a significant effect of ownership structure on environmental disclosure. The insignificant effect of institutional ownership on environmental disclosure could mean that as outside stakeholders, they may not have direct influence on the operations of the investing companies as their suggestions may be seen as advisory which may be taken or not depending on their individual stakes in the company.

5. Conclusion and Recommendation

Based on the result of the analysis, the study concludes that:

Companies size, age and profitability are the fundamental characteristics of a company that determine the nature and extent of environmental information a company discloses.

5.3 Recommendations

Based on the findings of this study, the following recommendations are advanced:

i. Government should compel companies aspiring to be listed on the Nigerian Exchange group to provide environmental risks disclosures as one of the preconditions for listing and should be enforced to continually provide such environmental disclosures in their annual reports and accounts. This will highlight the need for companies to prepare themselves to adopt uniform disclosure standards whenever they are put in place for them to follow. This can likely increase the incidence for companies to provide the needed information that will be more useful to stakeholders.

ii. Firm size defines the framework of incentives that predispose firms to disclose environmental information voluntarily, it is challenging to allow firms to do a cost-benefit analysis to determine how and where to disclose environmental information. In view of this, the Financial Reporting Council of Nigeria should in conjunction with the IASB hasten efforts to enact standards that will make environmental disclosure mandatory for all listed Nigerian firms. The absence of a regulation has left the disclosure of environmental information at the mercy of management.

iii. Management of listed companies in Nigeria should take environmental management and its disclosure as a thing of concern. This is because, proper environmental management will not only preserve the lives of those that will patronize the company's products but will also ensure the safety of employees and preserve the environment for generations to come. Also, disclosing of the company's efforts in preserving the environment will help in conferring legitimacy status on the company as such companies may be seen as good corporate citizens that could be rewarded by investors and other market participants.

iv. Considering the importance of environmental disclosure, stakeholders especially investors through their agents, brokers and investment institutions should ensure that companies that fail to provide adequate information about their environmental responsiveness and accountability are punished for negligence. This could be done by a gradual withdrawal of stocks invested in such companies and reinvesting them in environmentally sensitive ones to serve as an encouragement to be environmentally accountable, responsible and transparent. This will pave the way for encouraging and achieving an environmentally friendly society we all clamour for.

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