International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 7 Issue 4, July-August 2023 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Firm Attributes and Environmental Disclosure of Energy Corporations in Nigeria

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ABSTRACT

The study investigated the relationship between firm attributes and environmental disclosure among energy corporations in Nigeria. The research utilized a causal-comparative research design, focusing on energy corporations listed on the Nigerian Exchange Group (NEG) from 2013 to 2022. The sample included nine quoted firms primarily operating in the oil and gas, utility, and natural resource sectors. Secondary data from annual reports and financial statements of selected energy firms were used, and the Multiple Linear Regression Approach established the causal relationship between firm attributes and environmental disclosure. The findings revealed that larger and older firms faced challenges in providing detailed environmental information due to operational complexity and established reporting practices. However, firm leverage did not significantly impact environmental disclosure. The study offers valuable insights for enhancing environmental reporting and transparency among larger and older firms to meet stakeholder expectations and promote sustainability. Policymakers can utilize these findings to devise regulatory frameworks and incentives encouraging better environmental disclosure and fostering sustainable practices in the energy industry and beyond, ultimately positioning companies as leaders in the pursuit of a sustainable and profitable future.

KEYWORDS: *Firm Attributes, Environmental Disclosure, Energy Corporations, Firm Size, Firm Age, Firm Leverage, Sustainability, Legitimacy Theory, Global Reporting Initiative, Waste Management, Profitability, Liquidity*

How to cite this paper: Jerry Chukwuebuka Orajekwe | Okenwa Cy Ogbodo "Firm Attributes and Environmental Disclosure of Energy Corporations in Nigeria" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-7 | Issue-4, August 2023, pp.423-432, URL: www.ijtsrd.com/papers/ijtsrd59698.pdf

IJTSRD59698

INTRODUCTION

In the relentless pursuit of rapid development, numerous companies have unwittingly contributed to environmental degradation, prompting widespread concerns among various social groups. As a result, corporations, not only in Nigeria but across the globe, have recognized the need to shoulder a growing responsibility for the environment. In response to this escalating demand for accountability, environmental disclosure (ED) has emerged as a pivotal topic, drawing the attention of governments, societies, media outlets, and other stakeholders, all striving to forge a more sustainable future.

Amidst this evolving landscape, stakeholders now insist that businesses take into account environmentally friendly and sustainable development challenges, including critical issues like greenhouse gas emissions, toxic waste, and other pollutants [Braam et al., 2016]. This shift in focus has compelled companies to be answerable to a broader spectrum of interested parties beyond their shareholders.

However, while the call for an integrated stakeholder business approach that harmonizes financial performance and environmental impact grows stronger, firms often grapple with striking a balance between profitability and environmental responsibility [Muhammad et al., 2015]. The pursuit of economic prosperity must now be intertwined with the preservation of the environment, emphasizing the importance of firms addressing all business values and safeguarding global resources for the benefit of future generations.

Recognizing the significance of this paradigm shift, scholars have directed their attention to studying the intricate relationship between environmental issues and business practices. While substantial research has centred on the consequences of environmental management activities, such as financial performance, the findings have yielded inconsistent and ambiguous results [Nor et al., 2016; Haninun et al., 2018]. Consequently, comprehending the antecedents that drive corporations to engage in environmental responsibility activities remains a critical puzzle.

To address these pressing concerns, our study endeavours to shed light on the determinants of environmental performance among energy corporations listed on the Nigerian Exchange Group. By investigating potential firm attributes that influence attitudes towards environmental responsibility, such as firm size, age, and financial leverage, we aim to offer crucial insights into the factors driving variations in environmental responsibility performance within the Nigerian context. Ultimately, our research aspires to strengthen the foundation for a greener and more responsible business landscape, both in Nigeria and beyond.

Objective of the study

The primary aim of this research is to investigate how firm attributes influence the level of environmental disclosure among quoted energy corporations in Nigeria. Specifically, the study will explore the impact of firm size, firm age, and firm leverage on the environmental disclosure index (EDI) of these Nigerian energy corporations.

Research Hypothesis

The study was guided by the following null hypotheses.

1. There is no significant effect of firm size on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.
2. There is no significant effect of firm age on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.
3. There is no significant effect of firm leverage on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

Literature Review

Conceptual Framework

Firm Attributes

Firm attributes, also known as firm characteristics, encompass the distinct qualities and identities that set an organization apart from its competitors. These attributes serve as crucial parameters for understanding and characterizing a company, leading to diverse conceptualizations in research studies.

Scholars commonly associate firm attributes with its resources and organizational goals, recognizing that the structural, market and capital-related aspects of a corporation can be evaluated to ascertain its strengths and objectives (Gachoka, Aduda, Kaijage, & Okiro, 2018). Structural attributes, including age, profitability, leverage, ownership, and size, offer valuable insights into a company's position within its industry. Capital-related variables, such as liquidity and capital intensity, shed light on the financial foundation of a firm. Market-related variables, like industry type and environmental uncertainty, provide further context for understanding a company's strategic positioning and adaptability (Gachoka, Aduda, Kaijage, & Okiro, 2018).

This study centres on examining some structural aspects of firm characteristics, namely firm size, age, and leverage.

Firm Size

The size of a firm may have a notable impact on its environmental disclosure practices, shaping the extent and nature of its reporting. As researched by Zhang et al. (2022), a firm's size, whether measured by total assets, revenue, market capitalization, or employee count, provides insights into the scope and capabilities of its operations, which, in turn, influence the depth of its environmental disclosures.

In particular, larger firms tend to have more extensive operations, supply chains, and production capabilities, as emphasized by Bagale et al. (2021). Consequently, their environmental impact is often more significant, attracting greater attention from stakeholders. As a result, larger companies face higher expectations and pressures to disclose detailed environmental information. To address these demands and maintain transparency, these firms are more likely to engage in comprehensive environmental reporting.

Moreover, Skordoulis et al. (2020) point out that firm size also affects the distribution of resources within an organization. Larger firms generally possess more financial resources, enabling them to invest more significantly in environmental initiatives. With greater access to funds, these companies can allocate resources to research, development, and sustainability projects, leading to a greater propensity for environmental disclosure.

In this study, the influence of firm size on environmental disclosure will be assessed by measuring it through total assets.

Firm Age

Firm age, describing the period since a company's inception, plays a significant role in shaping its maturity, experience, and development over time (Fan & Wang, 2021). New businesses in their early phases focus on setting up operations, expanding clientele, and becoming profitable, while older firms go through various growth stages, such as market expansion and product diversification (Chege et al., 2020).

As a company gains experience, it accumulates organizational knowledge, learning about its industry, market dynamics, and client preferences, leading to improved planning, streamlined operations, and wiser decision-making (Chege et al., 2020). The age of a firm also influences its reputation and brand equity, with older companies often enjoying greater consumer loyalty, trust, and confidence in their products or services (D'Amato & Falivena, 2020). Efficiency tends to increase with a company's age, as it recognizes its strengths and acquires new talents, striving to reduce costs and enhance quality through specialization and process optimization (Adelino et al., 2017).

Notably, research indicates a positive correlation between firm age and environmental disclosure, suggesting that organizations with longer operating histories are more likely to fulfil their financial, social, and environmental commitments (Liu & Anbumozhi, 2009).

This study will assess the impact of firm age on environmental disclosure by quantifying it through the number of years the firm has existed.

Firm Leverage

Firm leverage measures a business's reliance on debt and equity funding for operations and investments (Chukwuebuka & Okonkwo, 2020). The debt-to-equity ratio serves as a standard metric to evaluate a company's leverage, with a lower ratio indicating a more conservative capital structure, and a higher ratio suggesting a greater reliance on debt financing (Purnamasari & Suryatama, 2021). Leverage impacts a company's risk-return profile, as additional debt amplifies both potential profits and losses, depending on the returns generated from investments (Cathcart et al., 2020).

In the context of environmental disclosure, leverage has been explored as a factor affecting a company's willingness to disclose environmental information in its annual reports. However, the research results have been inconsistent. Some studies suggest that leverage does not significantly impact a company's environmental disclosure (Ohidoa, Omokkhudu, & Oserogho, 2016; Dibia & Onwuchekwu, 2015; Prastiwi et al., 2016). In contrast, other studies demonstrate that a company's leverage can influence its capacity to disclose environmental information (Juhmani, 2014; Agbdam, 2015). Notably, based on Abubakar's (2017) research, environmental disclosure is negatively affected by leverage, with a minor impact of only 5%. Hence, understanding the intricate relationship between leverage and environmental disclosure is vital for comprehending a company's environmental reporting practices and its commitment to sustainability.

Environmental Disclosure

Environmental disclosure refers to the process through which businesses disclose information about their environmental activities to users of financial statements (Campbell, 2003). It involves providing details on how a company's operations impact the natural or operational environment and integrating the associated costs into financial reports, such as greenhouse gas emissions, waste management, and other environmental impacts.

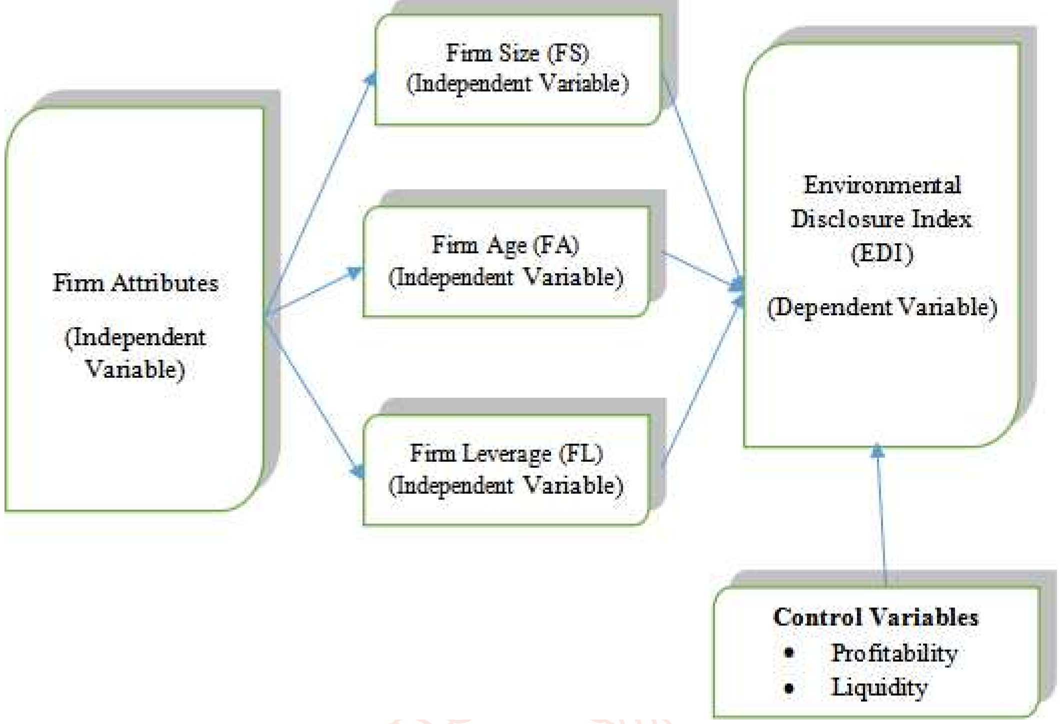
According to Makori and Jagongo (2013), environmental disclosure encompasses reporting all relevant information concerning social costs incurred by firms due to production externalities on the environment, which may directly result from the firm's operations. It also involves disclosing the extent of expenses for regular interventions aimed at bridging the gap between marginal costs and total costs stated in the financial statements of firms.

Environmental disclosure can be found in a corporation's annual reports, whether mandated by law or voluntary, to demonstrate compliance with environmental management and protection (Sobhani, 2009). It is an essential factor for a company to gain the trust of surrounding communities and thrive in the market. It serves as a means to release helpful information about ecological concerns, intended to influence public perception positively (Dibia & Onwuchekwu, 2015).

Various formats are used to disclose environmental information, such as annual reports, integrated reports, sustainability reports, environmental impact assessments, and reports on corporate social responsibility (CSR). These reports cover a wide range of environmental concerns, including greenhouse gas emissions, water consumption, waste management, and biodiversity protection.

Studies by Nor et al. (2016) suggest that companies disclosing their environmental impact can improve their financial performance, particularly in today's environmentally conscious marketplace, where stakeholders expect businesses to environmental disclosure to protect the planet and achieve better results.

Figure 1: Conceptual Framework



Source: Authors Conceptualisation (2023)

Theoretical Framework

Legitimacy theory serves as the foundation for this study.

Legitimacy Theory

Legitimacy theory asserts that organizations, including corporations, must maintain a positive reputation in society to retain their social license to operate. This entails complying with social norms and stakeholders' expectations to maintain legitimacy. The theory argues that companies will engage in environmental disclosures to demonstrate their commitment to sustainable practices and align with the expectations of their stakeholders.

Suchman (1995) first proposed legitimacy theory, categorizing three types of legitimacy: pragmatic, moral, and cognitive. Pragmatic legitimacy is based on the organization's ability to provide valued goods and services, while moral legitimacy hinges on its alignment with society's moral and ethical standards. Cognitive legitimacy, on the other hand, relates to the organization's conformity to cultural and institutional norms and values.

The legitimacy theory is frequently applied in the context of social and environmental issues, as businesses strive to maintain their reputation as legitimate entities in society (Villiers & Staden, 2006). It examines how society influences firms' levels of disclosure (Cho & Patten, 2007) and emphasizes the social contract between corporations and society. The theory suggests that businesses use environmental disclosure strategies to uphold their reputation as environmentally responsible corporate citizens (Milne & Patten, 2002). This aligns to appear legitimate in the eyes of stakeholders and adhere to societal norms (Aghdam, 2015).

Empirical Review

Chung, Bayne, and Birt (2023) investigated the drivers of Environmental, Social and Governance (ESG) disclosure in Hong Kong, distinguishing between voluntary and required disclosure regimes. The authors examined both the Bloomberg ESG scores and a disclosure index score that was personally created using regression testing and the 2019 Hong Kong Exchange ESG Guidance. According to the findings, the amount of ESG disclosure is only adversely correlated with the degree of concentrated ownership during the voluntary disclosure phase, which suggests that when ESG reporting is required, agency issues are reduced. The research also revealed that bigger companies publish considerably more ESG data during both voluntary and required disclosure periods.

Ponsian, Chalu, and Mzenzi (2023) used legitimacy and stakeholder theories to analyse the role of the business environment as a mediating factor in how company characteristics connect to environmental disclosure in the Tanzanian extractive sector. Panel data from the 2018 Tanzania Extractive Industry Transparency Initiative (TEITI) report spanning the years 2004 to 2018 is used in the research. The findings demonstrate that stakeholder pressure mediates the connection between a company's profitability, size, and environmental disclosure. In addition, media exposure is seen as mediating the connection between business size and environmental disclosure.

Akhter, Hossain, Elrehail, Rehman, and Almansour (2022) investigate whether business size, firm age, leverage ratio, profitability, participation of independent members on the board, and gender diversity have any influence on environmental disclosure procedures. The research was conducted with the framework of legitimacy theory in mind. To determine how extensive and high-quality environmental disclosures are, the research used a longitudinal methodology. Moreover, multiple linear regression is used to examine whether certain business characteristics influence environmental disclosures via panel data. From 2015 to 2019, this research looked at 345 annual reports from listed financial and non-financial organisations. The results show that tree planting is the most reported environmental disclosure, followed by investments in renewable energy and green infrastructure initiatives, and that budget allocation for climate change and carbon management policies are the least reported topics. In addition, the leverage ratio and company size are shown to positively influence environmental reporting.

Anh-Tuan, Huyen-Tram, Xuan-Hung, and Thanh-Long (2022) investigated the variables influencing the amount of environmental accounting information disclosed based on hotel managers' perceptions. To gauge how managers feel about the topic of environmental accounting disclosure, the author has relied on past research, particularly that of those with access to source data. Managers at 216 different hotels and related businesses provided the data. The extent to which various variables affect the disclosure of environmental accounting information is evaluated using quantitative research approaches. Managers' perspectives, regulatory restrictions, profits, company size, and societal pressure were all shown to have an impact on the disclosure of environmental accounting information.

Boshnak (2022) investigated the factors that determine corporate social and environmental voluntary disclosure (CSEVD) practises in Saudi Arabia to address the dearth of research in this area for Saudi-listed companies. The study employs CSEVD items from the Global Reporting Initiative-G4 criteria to conduct manual content and regression analysis on online annual report data for Saudi non-financial listed enterprises from 2016–2018. Due to new corporate governance laws and IFRS adoption, the models suggest that Saudi company CSEVD has grown over time, resulting in an average of 68% disclosure. The models also reveal that CSEVD is positively driven by company size, leverage, the manufacturing sector, and government ownership, and negatively driven by family ownership. The amount of CSEVD is unrelated to the profitability of a company, the size of an auditing firm, the age of a company, or the ownership structure of an institution.

Materials and Methods

The research design used in this study was a causal-comparative research design, which was chosen because the researchers aimed to establish the relationship between firm attributes and the environmental disclosure of firms using pre-existing data. The study centred on energy corporations listed on the Nigerian Exchange Group (NEG) during the period from 2013 to 2022. The sample size consisted of nine quoted firms primarily operating in the oil and gas, utility, and natural resource sectors. The details of the firms included in the sample are presented in Table 1. The study used secondary data sourced from the annual reports and financial statements of the selected listed energy firms in Nigeria. Furthermore, the study adopted the Multiple Linear Regression Approach to establish the causal relationship between firm attributes and environmental disclosure.

Table 1 Description of firms included in the sample

No	Firm	Sector
1	Ardova Plc	Oil & Gas
2	Conoil Plc	Oil & Gas
3	Eterna Plc	Oil & Gas
4	Geregu Power Plc	Utilities
5	Industrial and Medical Gases Nigeria	Natural resources
6	Japaul Gold & Ventures	Oil & Gas
7	MRS OIL Nigeria Plc	Oil & Gas
8	Seplat Energy Plc	Oil & Gas
9	TotalEnergies Marketing Nigeria Plc	Oil & Gas

Source: Nigerian Exchange Group (2023)

Model Specification

To evaluate H_1, H_2, and H_3, the study conducted regression analysis using the model below to explore the relationship between firm attributes and environmental disclosure of companies listed on NEG.

$$EDIti = \beta 0 + \beta 1SZEit + \beta 2AGEit + \beta 3LEVit + \beta 4PROit + \beta 5LIQit + \mu t \text{ ---------------------------- } (2)$$

Where:
B0 = Intercept

EDIit = Environmental Disclosure Index of firm i in year t

β1 – β5 = Parameter estimates

SZE_{it} = Size of firm i in year t

AGE_{it} = Age of firm i in year t

LEV_{it} = Leverage of firm i in year t

PRO_{it} = Profitability of firm i in year t

LIQ_{it} = Liquidity of firm i in year t

μ = Error term

Table 2 Operational Measurement of Variables

Variables	Acronym	Function	Formula
Firm Size	SZE	Independent Variable	Natural Logarithm of the value of total assets at the year-end
Firm Age	AGE	Independent Variable	Number of Years the firm has existed
Firm Leverage	LEV	Independent Variable	$^{Total\ Liabilities}/_{Total\ Assets}$
Firm Profitability	PRO	Control Variable	$^{Earnings\ After\ Tax}/_{Total\ Assets}$
Firm Liquidity	LIQ	Control Variable	$^{Current\ Assets}/_{Current\ Liabilities}$

Source: Authors Compilation (2023)

Dependent Variable

The dependent variable in this study, Environmental Disclosure, was measured using the EDI, calculated as an aggregate score of Global Reporting Initiative (GRI) 306 reportage. GRI 306 provides the framework for measuring waste management disclosure. Thus, scores in GRI 306a, GRI 306b, GRI 306c, GRI 306d, and GRI 306e give the measurement for the EDI. The total EDI score is calculated using the layout in Table 3 below.

Table 3 Dependent Variable Description and Measurements

GRI 306: Waste Management	Scale
Waste generation and significant waste-related impacts	"1" if disclosed or "0" if not disclosed
Management of significant waste-related impacts	"1" if disclosed or "0" if not disclosed
Waste generated	"1" if disclosed or "0" if not disclosed
Waste diverted from disposal	"1" if disclosed or "0" if not disclosed
Waste directed to disposal	"1" if disclosed or "0" if not disclosed

Source: Authors Compilation (2023)

Decision Rule

If the computed probability (P-value) is larger than the 5% level of significance, then the null hypothesis will be accepted, otherwise reject.

Results

Data Analysis

Table 5: Pearson Correlation Matrix

. corr EDI SZE Age LEV PRO LIQ

(obs=90)

	EDI	SZE	Age	LEV	PRO	LIQ
EDI	1.0000					
SZE	-0.6594	1.0000				
Age	-0.5186	0.2748	1.0000			
LEV	-0.1672	0.1958	0.1313	1.0000		
PRO	0.1073	-0.0989	-0.0546	-0.2064	1.0000	
LIQ	0.2592	-0.1797	-0.3273	-0.6473	0.1954	1.0000

Source: STATA 14 (2023)

The correlation results illustrate the relationships between the Environmental Disclosure Index (EDI) and the independent variables (Firm Size, Age, and Leverage) as well as the control variables (Profitability and Liquidity).

The negative correlation coefficient of -0.6594 between EDI and SZE indicates that as the size of the firm increases, the level of environmental disclosure decreases. Similarly, the negative correlation of -0.5186 between EDI and Age suggests that older firms tend to have lower environmental disclosure compared to younger ones.

Moreover, the weak negative correlation between EDI and Leverage (-0.1672) indicates that firms with higher leverage may have slightly lower levels of environmental disclosure. Meanwhile, the positive correlation coefficients between EDI and Profitability (0.1073) and Liquidity (0.2592) suggest that more profitable and liquid firms may have slightly higher levels of environmental disclosure, though these relationships are relatively weak.

Test of Hypotheses

The result of the linear regression analysis is presented below in Table 6.

Table 6: Regression result

. reg EDI SZE Age LEV PRO LIQ

Source	SS	df	MS		
				Number of obs	= 90
				F(5, 84)	= 21.46
Model	4.98601083	5	.997202167	Prob > F	= 0.0000
Residual	3.90287805	84	.046462834	R-squared	= 0.5609
				Adj R-squared	= 0.5348
Total	8.88888889	89	.099875156	Root MSE	= .21555

EDI	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
SZE	-.2944849	.0404444	-7.28	0.000	-.374913	-.2140568
Age	-.0058298	.0013289	-4.39	0.000	-.0084725	-.0031871
LEV	.0329924	.0978575	0.34	0.737	-.1616079	.2275927
PRO	.0382853	.101142	0.38	0.706	-.1628466	.2394173
LIQ	.0381375	.0630211	0.61	0.547	-.0871869	.1634619
_cons	2.460772	.3197547	7.70	0.000	1.824905	3.09664

Source: STATA 14 (2023)

Test of Hypothesis I

$H0_1$: There is no significant effect of firm size on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

The regression coefficient for firm size (SZE) is -0.2944849, with a p-value of 0.000. Since the p-value is less than the significance level of 0.05, we reject the null hypothesis and conclude that there is a significant effect of firm size on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

Test of Hypothesis II

$H0_2$: There is a significant effect of firm age on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

The regression coefficient for firm age (Age) is -0.0058298, with a p-value of 0.000. Since the p-value is less than the significance level of 0.05, we reject the null hypothesis and conclude that there is a significant effect of firm age on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

Test of Hypothesis III

$H0_3$: There is no significant effect of firm leverage on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

The regression coefficient for firm leverage (LEV) is 0.0329924, with a p-value of 0.737. Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis and conclude that there is no significant effect of firm leverage on the environmental disclosure index (EDI) of quoted energy corporations in Nigeria.

Discussion

The findings of the study indicate that firm size and age have significant effects on the environmental disclosure index (EDI) among quoted energy corporations in Nigeria.

The negative relationship between firm size and environmental disclosure suggests that larger firms may face challenges in providing detailed environmental information due to the complexity of their operations and potentially larger environmental footprints. Additionally, larger firms might encounter more resistance to disclosing sensitive environmental data as they may be subject to greater scrutiny and public expectations. This result negated the findings by Akhter, Hossain, Elrehail, Rehman, and Almansour (2022); Boshnak (2022).

Regarding firm age, the negative relationship with environmental disclosure may be attributed to the fact that older firms might have established practices and reporting methods that were prevalent in the past but may not align with the increasing demand for comprehensive and transparent environmental disclosures. As younger firms may have grown in an era of heightened awareness of environmental issues and stakeholder demands for transparency, they may be more inclined to disclose environmental information more comprehensively. This result negates the finding by Ghosh, Pareek, and Sahu (2022).

The non-significant relationship between firm leverage and environmental disclosure which is in line with the findings of Ohidoa, Omokkhudu, and Oserogho (2016); Dibia and Onwuchekwu (2015); Prastiwi et al., (2016) suggests that the level of debt financing used by firms may not be a significant determinant of their environmental disclosure practices. Companies' financing decisions may be driven by other factors, such as financial stability, capital structure preferences, and business strategies, which might not directly influence their environmental reporting practices.

Conclusion and recommendation

In the quest for a greener and more sustainable future, this study delved into the intriguing world of environmental disclosure among energy corporations in Nigeria. The findings have unveiled a fascinating interplay between firm attributes and the level of environmental transparency, revealing both challenges and opportunities for businesses in their sustainability journey. The riveting discoveries have shown that size and age do matter, at least when it comes to environmental disclosure. Larger and older firms seem to grapple with revealing their environmental practices, possibly due to their intricate operations and established reporting practices. However, this revelation serves as a clarion call for these industry giants to step up and embrace transparency, gaining the trust and support of their stakeholders on the path towards a greener tomorrow. On the other hand, the enigmatic connection between firm leverage and environmental disclosure remains a mystery yet to be unravelled. While this study did not find a significant effect, it ignites curiosity for future research to delve deeper into the intricate relationships between financing decisions and environmental reporting practices. Beyond the realm of energy corporations, these compelling findings have far-reaching implications for corporate sustainability across diverse industries. Embracing environmental responsibility can elevate a company's image, engender trust, and secure its place as a frontrunner in the race towards a sustainable and profitable future. To promote better environmental disclosure and sustainable practices, policymakers can consider implementing regulatory frameworks that encourage companies to disclose their environmental impacts. Additionally, they can provide incentives for firms that demonstrate proactive efforts in environmental reporting and conservation.

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