INTERNATIONAL REVIEW OF FINANCIAL STUDIES | IROFS
Vol 2, Issue 3; June, 2025 / visit: https://journals.unizik.edu.ng/irofs

FIRM ATTRIBUTES AND ENVIRONMENTAL DISCLOSURE OF LISTED HEALTHCARE FIRMS IN NIGERIA

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ABSTRACT
The study determined the effect of firm attributes on environmental disclosure of healthcare manufacturing firms in Nigeria. Specifically, the study examined the effect of firm size, firm age and ownership structure on environmental disclosure of healthcare manufacturing firms in Nigeria. The study used the Ex Post Facto research design. The population of the study comprised of all the eight (8) healthcare firms in Nigeria as at year ended December 2022. Census sampling method was employed in choosing the entire eight healthcare firms in Nigeria. The study used secondary data sourced from various annual reports of the sampled firms. The research covered a period of eleven (11) financial years (2012-2022). The data were analysed comparatively via both descriptive and inferential analyse. Test of hypotheses was done using Panel Least Square (PLS) regression analysis. The findings showed that firm size has positive effect on environmental disclosure of healthcare firms in Nigeria but this effect was not statistically significantly at 5% level of significance; firm age has positive effect on environmental disclosure of healthcare firms in Nigeria but this effect was not statistically significantly at 5% level of significance; firm leverage has positive effect on environmental disclosure of healthcare firms in Nigeria but this effect was not statistically significantly at 5% level of significance. It was recommended that large firms disclose more environmental information so that they can inform the community and society that they care about the environment.

Key words: *Environmental Disclosure, Firm Attributes, Firm Size, Firm Age, Ownership Structure.*

CITE AS: Aniefuna, T.J. & Ijeoma, N.B. (2025). Firm Attributes and Environmental Disclosure of Listed Healthcare Firms in Nigeria, *International Review of Financial Studies*, 2(3), 72 - 99. Available: https://journals.unizik.edu.ng/irofs

INTRODUCTION

The changing state of the environment and its growing costs to humanity have continued to attract the attention of stakeholders (Rokhmawati & Gunardi, 2017; Rokhmawati, Gunardi, & Rossi, 2017), leading to calls for measures to mitigate the adverse impacts of corporate activities. This has heightened the emphasis on environmental impact assessment and reporting (Ghani, Jamal, Puspitasari, & Gunardi, 2018). Environmental pollution from industrial operations has been linked to cases of respiratory infections and chronic obstructive pulmonary diseases (Nriagu, Udofia, Ekong, & Ebuk, 2016), alongside broader ecological damage and depletion of natural resources (Li, Su, Shi, & Zhang, 2015). Stakeholders are

increasingly focusing on sustainability disclosure as a key indicator of a firm's long-term value and resilience (Nworie & Aniefuna, 2024). They view transparent reporting on environmental, social, and governance matters as a signal of responsible management and reduced non-financial risk. As a result, environmental sustainability disclosure is now often regarded as an essential predictor of a company's ability to maintain and grow its market value.

In Nigeria, environmental information disclosure remains largely voluntary, as outlined by Onyema (2015), although the Nigerian Stock Exchange and other regulators stipulate certain mandatory and voluntary reporting requirements. In contrast, countries such as France mandate the inclusion of environmental and social commitments in annual reports (Adeeko, 2019), while Sweden requires state-owned enterprises to report sustainability commitments in line with Global Reporting Initiative (GRI) guidelines (Sholotan, 2016). Similarly, the United States, Denmark, and the Netherlands impose legal obligations on firms to disclose environmental information (Awe, 2017). Firm attributes refer to the inherent characteristics of a company that shape its operational and policy decisions, including those relating to non-financial disclosures such as environmental reporting (Nworie, Okafor & John-Akamelu, 2022). Scholars argue that identifying the firm-specific characteristics that influence disclosure choices is crucial for stakeholders. While some studies have assessed disclosure levels by counting words, sentences, or pages in reports (Abubakar, 2017; Ohidoa, Omekhodu, & Oserogho, 2016), such methods may be distorted by stylistic variations and presentation formats (Brammer & Pavelin, 2006). This reinforces the need to investigate the role of firm attributes in shaping environmental disclosure, particularly within healthcare manufacturing firms in Nigeria.

Growing global interest in full disclosure, partly driven by financial scandals and the adoption of International Financial Reporting Standards (IFRS), has expanded the scope of reporting to include environmental and social matters. Nevertheless, while some firms disclose costs related to corporate social responsibility (CSR) activities (Makori & Jagongo, 2013; Siueia, Wang, & Deladem, 2019), others avoid reporting unfavourable CSR or environmental outcomes due to concerns about reputational or financial repercussions (Dibia & Onwuchekwa, 2015). Existing literature has examined various aspects of environmental disclosure, including its necessity, relationship with performance, and disclosure challenges (Omoye & Wilson-Oshilim, 2018; Udo, 2019). However, findings remain inconclusive. For example, Odoemelam and Okafor (2018) reported generally low environmental disclosure

among Nigerian non-financial firms, while Moruff, Salisu, Muhammed, Garba, and Nasiru (2021) found no significant relationship between firm age, financial performance, and disclosure. Similarly, Jeroh (2020) and Olurankinse and Mamidu (2021) observed no significant effect of firm size, return on asset, and firm age on disclosure quality, whereas Ofoegbu, Odoemelam, and Okafor (2018) showed that environmentally sensitive industries disclosed more than less sensitive ones. Other studies (Ogboro & Osazuwa, 2022; Prot, Mzenzi, & Chalu, 2021; Ndalu, Ibanichuka, & Ofurum, 2021; Kabiru, 2020) identified firm age, firm size, ownership structure, and capital structure as significant predictors of disclosure. Despite these contributions, the influence of firm attributes on environmental disclosure remains underexplored in specific sectors such as healthcare manufacturing. Few studies, such as Farouk and Shehu (2013) and Akano, Jamiu, Olaniran, and Timothy (2013), have addressed related factors but without adequate focus on this industry. This gap, along with a lack of longitudinal sector-specific studies, provides a strong justification for examining the effect of firm attributes on environmental disclosure among listed healthcare manufacturing firms in Nigeria. Prior literature on firm attributes and environmental disclosure were characterized with mixed reaction. Some studies reported that firm attributes has no significant effect on environmental disclosure, while others were of the opinion that firm attributes has no influence on environmental disclosures ranging from positive to negative significant effect. However, most the studies focused on manufacturing firms. To the best of the researcher's knowledge there is a limited study of this nature in Nigerian Health sector. This study thereby ascertains the effect between firm attributes and environmental disclosure in Nigerian health sector from 2012 to 2022.

Objectives

The main aim of this study is to determine the effect of firm attributes on environmental disclosure of healthcare manufacturing firms in Nigeria. Specifically, the study intends to:

1. determine the effect of firm size on environmental disclosure of healthcare manufacturing firms in Nigeria.
2. investigate the effect of firm age on environmental disclosure of healthcare manufacturing firms in Nigeria.
3. examine the effect of ownership structure on environmental disclosure of healthcare manufacturing firms in Nigeria.

LITERATURE REVIEW

Environmental Disclosure

Adapting from Chaklader and Gulati (2015) and Nworie, Obi, Anaike and Uchechukwu-Obi (2022), environmental disclosure practices are means of communicating to the stakeholders, the impact of the firm's activities on the environment. Disclosure of environmental information forecasts financial and reputational benefits. Sometimes, managers advocate sustainability to provide comprehensive and significant information about companies' environmental performance (Dias-Sardinha, Reijnders, & Antunes, 2007). Firms perform environmental activities in order to cut costs, improve efficiency and the company's image and reduce insurance premiums. These facts eventually motivate firms to report their environmental performances to gain competitive advantage. In addition, unlike poor environmental performers, better environmental performers will connect with the existing stakeholders using verifiable information. Worldwide, the volume of environmental reporting is increasing over time since companies are paying attention to the level of disclosure (Eljayash, James, & Kong, 2012).

Firms' internal characteristics are also well-connected to their' environmental performance (McGuinness, Vieito, & Wang, 2017). Environmental disclosure means that a firm is obligated by law to include environmental information in annual reports, either voluntarily or statutorily. Environmental disclosure also communicates relevant information to stakeholders and society as a whole as a result of the company's actions as they influence the environment. According to Panigrati (2015), environmental disclosure is information that is presented to analyze a company's environmental conduct and the economic consequences of that activity. It includes both financial and non-financial information. Environmental disclosure is defined by Ejoh, Orakand, and Sakey (2014) as a set of information about a company's past, current, and future environmental operations. Environmental disclosure, according to Ong, Tho, Hoh Thai, and The (2016), is a declaration that demonstrates a company's environmental efforts, such as the company's aims, environmental policies, and environmental consequences, which are documented and publicized annually to the general public. Environmental disclosure, according to Dibia and Onwuchekwu (2015), aids corporations in capturing public opinion of their operations. Because of the importance of the environment and the devastating impact of companies' activities on the environment, environmental disclosure serves as a medium of communication between the company and stakeholders (Ndalu, Ibanichuka and Ofurum 2021). Disclosure is required because of the importance of the environment and the

devastating impact of companies' activities on the environment (Abubakar, Moses & Inuwa, 2017).

According to Nworie, Cyril-Nwuche and Oduche (2024), environmental disclosure refers to information regarding environmental actions that occurred in the past, present, or future, and should be revealed to the public on an annual basis. This data might be in the form of financial and non-financial data, and it can be quantitative or qualitative (Ndalu, Ibanichuka and Ofurum 2021). Environmental disclosure refers to all information on the environment that is reported or made available in the annual report of the company. Environmental disclosure has been quantified both quantitatively and subjectively using content analysis and the environmental disclosure index. According to a study of the literature, several studies measured environmental accounting disclosure using both quantitative and qualitative methods. Both methodologies were utilized by researchers such as Abubakar, Moses, and Inuwa (2017), Adams and Busola (2017), Ong et al., (2016), to measure environmental accounting disclosure of companies.

Environmental Disclosure is an official declaration that explains the eco-friendly efforts of an entity which usually includes the purposes of the company on environmental strategic remediation. How the operation of the firm had impacted the environment are regularly reported and released to the public in the firm's annual report (Ong, Tho, Goh, Thai & The, 2016). The Association of Chartered and Certified Accountants, defined environmental disclosures as a combination of descriptions, which consists of the clarifications, purposes, and statistical data, such as the amount of resources expended, and pollution done for a particular accounting period on the environmental effect of the company (Olowookere, Taiwo & Onifade 2021). Presently, there are no formal guidelines that require oil and gas companies in Nigeria to disclosure environmental issues. However, there is a Global Reporting Initiative which could serve as a guide to companies in the oil and gas sector.

Global Sustainability Standards Board (GSSB) issued environmental disclosure Indexes. The indexes are standards in measuring the effects an entity has on the environment. Global Reporting Initiative 307 deals with environmental compliance. Impact in the GRI Standards are usually referred to the effect a firm has on the economy, the surroundings, and/or society, which in turn can indicate its influence which may be encouraging or damaging to sustainable development (GRI, 2018). Thus, this study chose six aspects in GRI Standards Glossary of 2018. These are Energy, Materials, Water, Waste, Biodiversity and Emissions. The six areas

were chosen as they form the core operational expenses in Nigeria oil and gas firms. Environmental disclosures are usually measured by quantitative or qualitative means.

Firm Attributes

Firm attributes are the distinctive characteristics and features of a company—such as its size, age, structure, and financial capacity—that influence its strategic decisions and operational practices, including disclosure behavior (Mohammed, 2018). Researchers had studied very well on firm attributes, in spite of the fact that studies had recommended making environmental disclosure obligatory, corporate attributes features had been found influencing environmental disclosure by some studies with mixed results (Sulaiman, Aruwa and Musa, 2018; Onyinye & Amakor, 2019). Firm specific attributes are factors that are mostly under the direct control of management. The firm specific indicators include firm size, liquidity, growth rate of premium, leverage, underwriting risk and age of the firm. On the other hand, the macroeconomic indicators are those factors that are beyond the control of management. This includes interest rate, GDP, and industry size (Sumaira & Amjad, 2013).

This means that the financial performance of insurance companies could be ascertained using firm specific attributes (internal attributes) and macroeconomics variables (external attributes) as major determinants of profitability of the companies. Malik (2011) clearly classified the internal attributes into two major sub-categories, namely, the financial variables and non-financial variables. From his explanation, he regarded financial variables as determining factors which are directly driven from items in a financial position and income statements. This includes size, leverage, liquidity, premium growth, loss ratio and tangibility of asset. On the other hand, the non-financial variables are those factors which cannot be driven from the items in the financial position and comprehensive income. The non-financial variables are classified as management quality or competency, efficiency and productivity, age, and scope of operation (Yuqili, 2017). A firm is required to maintain a balance between liquidity and profitability while carrying out its day to day operations. Liquidity is a precondition to ensure that firms are able to meet their short-term obligations and continued flow can be guaranteed from a profitable venture. The importance of cash as an indicator of continuing financial health should not be surprising in view of its crucial role within the business.

Firm Size and Environmental Disclosure

Previous empirical studies showed that the firm size affects the level of disclosure of its environmental accounting information. The larger the size of the business, the more likely publishes environmental information. Large firms are always confident of their prospects, so they are often willing to spend expense to publicize more voluntary information in order to make a difference to rival businesses and increase its value (Hasan & Hosain, 2015). Shuchi (2009) provides strong evidence in support of the influence of firm size and environmental performance, and the study by Dienes, Cooper & Shelly, (2016) indicates that firm size is among the most important drivers of the disclosure of sustainability reports. On the other hand, Chandok and Singh (2017) state that environmental disclosure on the firm's website and overall disclosure has association with company size and systematic risk, while Haddad Sbeiti, & Qasim, (2017) observe that firm size has always affected the level of environmental disclosure. Several studies (Ahmadi & Bouri, 2017; Andrikopoulos, Samitas & Bekiaris, 2014; Karaman, Kilic & Uyar, 2018) show that there is a positive relation between firm size and environmental disclosure. They indicate that large firms disclose more environmental information so that they can inform the community and society that they care about the environment.

In contrast to other studies, Marquis and Qian (2014) and Shamil, Shaikh, Ho & Krishnan (2014) found a negative correlation for firm size and corporate social responsibility (CSR) disclosure, while Kolsi (2017) shows that firm size does not have any impact on the level of disclosure adopted. The support for firm size being positively associated with environmental disclosure may be because firms with increased vulnerability, due to their size, disclose more information voluntarily as a means of managing legitimacy, especially firms operating in industries with a high environmental footprint, such as oil and gas, and mining. They may adopt substantive environmental actions, whereby environmental legitimacy can be achieved by increasing environmental disclosures (Kuo & Yi-Ju Chen, 2013). Although there are mixed results, by using legitimacy theory, the large firms disclose more in order to manage the firm's positive image.

Ho_1: Firm size does not significantly affect environmental disclosure of healthcare manufacturing firms in Nigeria.

Firm age and Environmental Disclosure

This is measured by the date of incorporation and it is an important variable that enhance a firm towards expressing its obligations to the environment in which it has attained a lofty height (Oyedokun, Fowokan, Hassan & Akintoye, 2016; Innocent & Okafor, 2018). The older a firm becomes, the more it should be willing to voluntarily express how much effort and commitment it has made in ensuring sustainable development towards the environment in which it operates and not just consider its financial obligations toward the shareholders alone (Welbeck, Owusu, Bekoe, & Kusi, 2017). Findings from prior studies found firms age to be significant to voluntary disclosure of EI (Benjamin, Okpanachi, & Muhammad, 2017; Elshabasy, 2018). In contrary, Akbas (2014) revealed that firm age is not statistically significant to the firm choice of either disclosing or withholding environmental information in their annual report as a firm is naturally born to disclose such information that will only promote their profitability, especially if its disclosure is not imposed by law or other regulations. Okoye and Adeniyi (2018) found company age does not affect voluntary disclosure of EI. It is expected that as a firm grows in age, with a level of exposure and experience that must have been gathered in the process of growth, the consciousness of the board and those charged with responsibilities to steer the affairs of the company should awaken to the firm's contractual relationship and not only focused on their responsibilities to the shareholders but also give consideration to the environment in which it operates.

Mature companies are usually up-to-date with current developments in their industries. They are more appropriate at performing on new policies to sustain their business. Mature companies are more expected to involve in environmental performance to impact sensitively on their business and to legalize their survival. Grown-up firms are more likely to be larger firms and are prepared to provide information to influence their uninterrupted survival (Shuaibu, 2020). Grown-up firms may well have additional knowledge and precaution when it comes to their corporate environment. Learning-by-doing models also advocated that older companies may benefit from their superior corporate experience. On the other hand, young firms could also strive to achieve minimum proficient balance as they would want to make effort to overcome their problem of newness. Nonetheless, once young companies have survived the initial few years, they become stabilized and follow their new organizational practices (Coad, 2014). Thus, age signifies how long the firm has being in business. Older firms seem to have more experienced to disclosure environmental policies but young firms could disclosure environmental policies after overcoming their early periods of existence.

H_{o2}: Firm age does not significantly affect environmental disclosure of healthcare manufacturing firms in Nigeria.

Leverage and Environmental Disclosure

Adenugba, Ige, and Kesinro (2016) explained financial leverage as the use of debt to acquire more assets. A firm with a moderate level of financial leverage is expected to disclose its environmental commitment towards assuring the populace that the firm is financially buoyant. Leverage is employed to increase the return on equity. However, an excessive amount of financial leverage increases the risk of business failure. Olusegun (2012) found financial leverage to be positive and significant on firm's willingness to disclose EI. Egbunike and Tarilaye (2017) also found financial leverage to have a positive influence on firm's willingness to disclosure voluntarily its EI. In contrary, Adeniyi and Adebayo (2018) found financial leverage to be insignificant to firms' voluntary disclosure of EI. Ofoegbu and Odoemelam (2018) established that firms' commitment to voluntary disclosure of EI in the published annual report is not induced by level of its financial leverage. Akbas (2014) found financial leverage to be statistically irrelevant to the disclosure of EI. Ohidoa, Omokhudu and Oserogho (2016) found financial leverage not to significantly influence the disclosure of environmental information. Barnali and Puja (2015) found financial leverage to be insignificant to firms' commitment to the disclosure of environmental information. This implies that the ratio of debt to equity does not influence firms to wake up to its environmental responsibilities. Financial leverage was found not to have significant influence on firms' voluntary ED among listed firms (Adeniyi & Adebayo, 2018). A study by Kiende and Karambu (2016) revealed that financial leverage has no significant effect on voluntary ED by listed firms. Companies with higher leverage are more likely to increase the volume of corporate disclosure to reduce agency costs (Ho &Taylor, 2007). It is argued that as firm debt (leverage) increases, the investors' monitoring demand for information also increases in order to keep themselves informed about operating performance of the company, including environmental performance (Clarkson, Li, Richardson & Vasvari, 2008).

H_{o3}: Firm leverage has no significant effect on environmental disclosure of healthcare manufacturing firms in Nigeria.

Theoretical Review

Stakeholders' Theory was originally introduced at Stanford research institute (SRI) by Freeman, 1984). The elementary proposal of the stakeholders' theory is that corporate success is reliant upon the effective administration of all the interactions that an entity has with all its stakeholders (current and potential shareholders, and other stakeholders). The concept affirms that, administrators must please suppliers, employees, customers, local community, etc. who can influence the firm's results. Stakeholders' theory maintains that it is not appropriate for managers to focus completely on the needs of shareholders alone (Anaike, Nworie & Ochuka, 2024).

Applying the stakeholders' theory, Solomon 2020 posited that management should make effort in building a framework that will be reactive to the distresses of all stakeholders who are being affected by extraordinary levels of environmental issues and degradations. Relying on stakeholders theory, Olowookere et al., (2021), and Nor et al. (2016) had examined the effects of environmental disclosure on financial performance, while employing Stakeholder theory, Olaleye, and Igbekoyi (2020) emphasized that management should use environmental objectives to reveal to all stakeholders the firm's policies on occupational health and safety, compliance obligation, and company environmental culture and policies. Thus, stakeholders are considered appropriate for the study as they explain the theoretical perspective for managers to satisfy stakeholders on environmental disclosure quality which is the fundamental issues of this study. Hence, the firm would have satisfied justice, legislation and environmental care. The implication of these theories on this study is that, it would be beneficial for the entity to engage in certain environmental activities that non-shareholders recognized as important, since without this, these groups might withdraw their backing from the firm

Empirical Review

Empirical evidence on the effects of firm structural and financial attributes on environmental disclosure is extensive but inconsistent. Several studies report positive links between firm size or growth and disclosure, with Omoye and Wilson-'Oshilim (2018), Mohammed (2018), Ali, Mouri and Thasinul (2020), Prot, Mzenzi and Chalu (2021), Kabiru (2020), and Egbunike and Tarilaye (2017) all finding that larger or growing firms tend to disclose more environmental information. Relatedly, firm growth and size effects are mirrored in sector-specific findings: Ekwueme (2022) finds firm growth influences risk disclosure in healthcare, while

Olurankinse and Mamidu (2021) and Osazuwa, Ahmad and Adam (2016) document post-IFRS increases in disclosure quantity, suggesting regulatory and scale effects.

Profitability and financial performance show a mixed pattern: Innocent and Gloria (2018), Elshabasy (2017), and Ali, Mouri and Thasinul (2020) find positive associations between profitability and disclosure or higher-level disclosure categories, whereas Moruff, Salisu, Muhammed and Garba (2021), Jeroh (2020), and Hasan and Hosain (2015) report insignificant links. Leverage similarly produces divergent results: some studies observe a positive relationship between leverage and disclosure (Amaechi & Nwankwe, 2018; Helmi, 2020), others report negative or insignificant effects (Ahmad, 2017; Abubakar, 2017; Ohidoa, Omekhodu & Oserogho, 2016), while Kabiru (2020) finds leverage significant for disclosure quality in cement firms, indicating that the leverage–disclosure relationship may be context and measure dependent.

Governance and ownership characteristics also produce varied empirical outcomes and appear to interact with firm attributes. Board-related variables are frequently significant but in inconsistent directions: studies such as Ortas, Álvarez and Zubeltzu (2017) and Bansal, Lopez–Perez and Rodriguez–Ariza (2018) report that board independence and independent directors enhance social or environmental disclosure, while Ndalu, Ibanichuka and Ofurum (2021) and Ogboro and Osazuwa (2022) find negative effects for some governance configurations or for managerial and foreign ownership. Board size, gender diversity, audit and environmental committees, and board diligence are each implicated across studies:

Okudo and Amahalu (2021), Odoemelam and Okafor (2018), and Salawu et al. (2021) document significant governance effects, whereas Ahmad, Rashid and Gow (2017) and Ezeagba, Racheal and Chiamaka (2017) emphasize industry contingency or mixed industry results. Ownership concentration and institutional holding are shown to matter in Ogboro and Osazuwa (2022) and Majeed, Aziz and Sale (2015), while studies in developing and emerging markets (Ahmad & Osazuwa, 2015; Kabiru, 2020; Khalid, Kouhy & Hassan, 2017) highlight how ownership, culture, and audit type interact with firm attributes to shape disclosure.

Contextual factors, measurement choices and methodology help explain the pervasive contradictions in the literature and point to research gaps. Several studies emphasize industry sensitivity and regulatory shifts as moderators: Ofoegbu, Odoemelam and Okafor (2018) find higher disclosure in environmentally sensitive industries; Mohammed (2018) linked IFRS

adoption and governance improvements to higher disclosure; and Ferguson (2016) and Meek (2015) show wide variability in disclosure scope and risk content. Methodological heterogeneity—word counts versus quality indices (Abubakar, 2017; Fatma et al., 2019), cross-sectional versus longitudinal designs (Ahmad, 2017; Prot et al., 2021), and different regression techniques (panel OLS, GLS, logistic, PCSE)—coincides with divergent findings reported by Shuaibu (2020), Yousra (2018), Elshabasy (2017), and Odoemelam and Okafor (2018). Collectively, the literature (e.g., Ogboro & Osazuwa, 2022; Kabiru, 2020; Ali et al., 2020; Innocent & Gloria, 2018; Moruff et al., 2021; Ndalu et al., 2021; Amaechi & Nwankwe, 2018; Egbunike & Tarilaye, 2017; Helmi, 2020; Okudo & Amahalu, 2021) reveals robust associations in some contexts but no universal patterns, underscoring the need for sector-specific, carefully measured, and longitudinal studies—such as healthcare manufacturing in Nigeria—that control for regulatory regime, industry sensitivity, governance structure, and measurement approach.

MATERIALS AND METHOD

The study was adopted the *Ex Post Facto* research design. This design was adopted because the main aim of the study was to evaluate the cause-effect relationship that exist between the dependent and the independent variable using the data that already existed and the study made no attempt to change it nature and values. The nature of the data used has both cross sectional and content analysis. The data will be sourced from the annual financial reports of Nigerian healthcare manufacturing firms quoted on the Nigeria Exchange Group.

The population of the study comprised of all healthcare firms in Nigeria as at year ended December 2022. The quoted healthcare manufacturing firms on the Nigerian Exchange Group (NGX) are stated below: These includes; Ekocorp plc. Fidson Healthcare plc, Glaxco Smithkline consumer Nig Plc, May & Baker Nigeria plc, Morison Industries plc. Neimeth International Phamaceuticals plc**.** Considering the limited number of healthcare firms and the need to adopt an equal sample size, the census sampling method was employed in choosing the entire eight healthcare firms in Nigeria.

The study used secondary data sourced from various annual reports of the sampled firms at the libraries and website of the NGX (www.NGX.com.ng). The research covered a period of eleven (11) financial years (2012-2022). The eleven-year period will be used for the estimations in order to use information from the same accounting reporting regime (that is, IFRS) – especially since Nigeria adopted IFRS in 2012.

The econometric models of the study was adapted from the studies by Ohidoa, Omekhodu, and

Oserogho (2016) as shown below:

$ED_{it} = \alpha + \beta_1 FAGE_{it} + \beta_2 FSIZEit + \beta_3 LEV_{it} + \varepsilon i$ ……. Eqn 1.

Where;

ED = Environmental Disclosure

FAGE = Firm Age

FSIZE = Firm Size

LEV= Leverage

α = Constant Term

β = Coefficient Term

i = No of firms

t = Time Period

e = Error term

Thus, in order to ascertain the effect of firm attributes on environmental disclosure of the health sector listed on the NGX, the study adopted the following models in a bid to provide answers to the null hypotheses of the study:

The model was functionally expressed as:

Environmental disclosure = *f* (firm size, age, leverage) …… Eqn 2.

The general econometric model for the study was specified thus;

$EVD_{it} = \alpha + \beta_1 FSZ_{it} + \beta_2 AGE_{it} + \beta_3 LEV_{it} + \varepsilon_{it}$…… Eqn 3.

Where;

EVD = Environmental disclosure.

FSZ = Firm size measured as natural log of total asset.

AGE = Firm age measured as current year less year of incorporation.

LEV = Leverage measured as the ratio of total debt to total equity.

α = constant.

β_1 to β_3 = the coefficient of the parameter estimate.

ε = the error term or residual.

i = ith firm for cross-section

t = time period

Table 1: Operationalization of Variables

Variables	Notation	Measurements	Sources (used by)
Dependent variable:			
Environmental disclosure	EVD	Kinder Lydenberg Domini (KLD) rating index Scores the firms earns in disclosure i.e. 3 monetary, 2 quantitative, 1 general and 0 for non- disclosure.	Adeniyi & Adebayo (2018); Ofoegbu & Megbulu (2016) Bowrin (2013), Kolsi (2017), Dobbs and Staden (2016), Hossain et al. (2017)
Independent variables:			
Firm size	FSIZ	Measured as the natural log of total asset.	Salaudeen and Akano (2018)
Firm age	AGE	Measured as current year less year of incorporation.	Pratama (2017); Haladu and Beri (2016)
Leverage	LEV	Measured as the ratio of total debt to total assets.	Ogbeide (2017); Ohidoa et al. (2016)

Source: Author's Compilation, 2023.

The data were analysed comparatively via both descriptive and inferential analyse. The descriptive statistics was first conducted in order to gain understanding of the sample characteristics as regards the selected variables. Inferential statistical analysis was carried out with the aid of E-Views 9.0 statistical software. Panel Least Square (PLS) regression analysis was used to predict the value of a variable based on the value of the other variables. The decision for the hypotheses is to accept the alternative hypotheses if the p-value of the test statistic is less or equal than the alpha and to reject the alternative hypotheses if the p-value of the test statistic is greater than alpha at 5% significance level.

ANALYSES AND RESULTS DISCUSSION

Descriptive Analysis

Table 2 Descriptive Statistics

	EVD	FSIZ	AGE	LEV
Mean	0.909091	4893980.	17.00000	56.41112
Median	1.000000	5953075.	17.00000	53.47266
Maximum	2.000000	6633420.	22.00000	94.85285
Minimum	0.000000	2379214.	12.00000	31.71337
Std. Dev.	0.700649	1669802.	3.316625	22.06784
Skewness	0.105842	-0.323763	-4.90E-17	0.417490
Kurtosis	2.228395	1.370896	1.780000	1.881855
Jarque-Bera	0.293418	1.408581	0.682183	0.892576
Probability	0.863545	0.494459	0.710994	0.639999
Sum	10.00000	53833783	187.0000	620.5223
Sum Sq. Dev.	4.909091	2.79E+13	110.0000	4869.897
Observations	11	11	11	11

Source: E-Views 10.0 Descriptive Output, 2025

The descriptive statistics in Table 2 revealed that the environmental disclosure (EVD) of the sampled healthcare firms is 0.909; the maximum of 2.000 with a minimum of 0.000 with a standard deviation of 0.701. The average firm size (FSIZ) from the sampled observations is 4893980.0; standard deviation of 1669802.0; a maximum observation of 6633420.0 with a minimum value of 2379214.0. The mean value of firm age (AGE) stood at 17.000, a standard deviation of 0.3317; maximum observation of 22.000 with a minimum value of 12.000. The mean of firm leverage (LEV) is at the average of 56.411; standard deviation of 0.22.068; a maximum observation of 94.853 with a minimum value of 31.713. Skewness is the measure of how much the probability distribution of a random variable deviates from the normal distribution. Table 4.1 delineates that the probability distribution for FSIZ (-0.324); AGE (-4,900) and LEV (0.417) are positively skewed distribution.

Test of Hypotheses

In other to examine the impact relationships between the dependent variable debt and the independent variables (FSIZ, AGE, LEV and EVD) and to also test our formulated hypotheses, we used a pooled multiple regression analysis since the data had both time series (2012-2022) and cross sectional properties (Nigerian healthcare firms). The pooled interaction based multiple regression results are presented and discussed in Table 3 below.

Hypotheses One

H_o: Firm size does not significantly affect environmental disclosure of healthcare manufacturing firms in Nigeria.

H_i: Firm size significantly affects environmental disclosure of healthcare manufacturing firms in Nigeria.

Table 3: Panel Least Square Regression Analysis

Dependent Variable: EVD
Method: Least Squares
Date: 12/31/23 Time: 23:28
Sample: 2012 2022
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.240159	0.680553	0.352888	0.7323
FSIZ	1.37E-07	1.32E-07	1.033627	0.3283
R-squared	0.106113	Mean dependent var		0.909091

Adjusted R-squared	0.006792	S.D. dependent var	0.700649
S.E. of regression	0.698266	Akaike info criterion	2.282531
Sum squared resid	4.388173	Schwarz criterion	2.354876
Log likelihood	-10.55392	Hannan-Quinn criter.	2.236928
F-statistic	1.068386	Durbin-Watson stat	1.282094
Prob(F-statistic)	0.328285		

Source: E-Views 10.0 Regression Output, 2025

Table 3 shows that there is an insignificant positive relationship between environmental disclosure (EVD) and firm size (FSIZ) of healthcare firms in Nigeria. This can be observed from the beta coefficient (β_1) of 1.370, t-statistics of 0.1.033 with p-value of 0.328 which is positive but not significant at 5%. The F-statistic of 1.068386 with an associated Prob (F-statistic) of 0.328285 is not statistically significant at 5%, which reveals that the model is well fitted, while the coefficient of determination R^2 of 0.106, explains the individual variation of the dependent variable (EVD) as a result of the changes in the independent variable (FSIZ). It can be said firm size has combined predictive power of 11% in affecting environmental disclosure of healthcare firms in Nigeria, while the remaining 89% is accounted for by other factors which are not captured in the model.

Decision: Since the P-value of the test = 0.328 is greater than 0.05 (5%)., this study upholds that firm size does not significantly affect environmental disclosure of healthcare firms in Nigeria at 5% level of significance. Thus, null hypothesis is accepted and alternative hypothesis rejected. This result agreed with Yousra (2018) who revealed that there is an insignificant relationship between Firm Size and environmental information disclosure, and Abubakar (2017) whose study reported that firm size has positive insignificant influence on environmental disclosure. However, the result disagreed with Prot, Mzenzi and Chalu (2021) results showing that firm age, firm size are significant factors that positively influence environmental disclosure. Olurankinse and Mamidu (2021); Kabiru (2020) found that firm age, firm size and leverage has significant impact on quality of environmental disclosure.

Hypotheses Two

H_o: Firm age does not significantly affect environmental disclosure of healthcare manufacturing firms in Nigeria.

H_i: Firm age significantly affects environmental disclosure of healthcare manufacturing firms in Nigeria.

Table 4: Panel Least Square Regression Analysis

Dependent Variable: EVD
Method: Least Squares
Date: 12/31/23 Time: 23:29
Sample: 2012 2022
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.481818	1.122608	-0.429196	0.6779
AGE	0.081818	0.064922	1.260252	0.2393

R-squared	0.150000	Mean dependent var	0.909091
Adjusted R-squared	0.055556	S.D. dependent var	0.700649
S.E. of regression	0.680908	Akaike info criterion	2.232188
Sum squared resid	4.172727	Schwarz criterion	2.304533
Log likelihood	-10.27703	Hannan-Quinn criter.	2.186585
F-statistic	1.588235	Durbin-Watson stat	1.175084
Prob(F-statistic)	0.239272		

Source: E-Views 10.0 Regression Output, 2025

Table 4 shows that there is an insignificant positive relationship between environmental disclosure (EVD) and firm age (AGE) of healthcare firms in Nigeria. This can be observed from the beta coefficient (β_1) of 0.082, t-statistics of 0.1.260 with p-value of 0.239 which is positive but not significant at 5%. The F-statistic of 1.588235 with an associated Prob (F-statistic) of 0.239272 is not statistically significant at 5%, which reveals that the model is well fitted, while the coefficient of determination R^2 of 0.150, explains the individual variation of the dependent variable (EVD) as a result of the changes in the independent variable (AGE). It can be said firm age has combined predictive power of 15% in affecting environmental disclosure of healthcare firms in Nigeria, while the remaining 85% is accounted for by other factors which are not captured in the model.

Decision: Since the P-value of the test = 0.328 is greater than 0.05 (5%)., this study upholds that firm age does not significantly affect environmental disclosure of healthcare firms in Nigeria at 5% level of significance. Thus, null hypothesis is accepted and alternative hypothesis rejected.

Hypotheses Two

H_o: Firm leverage has no significant effect on environmental disclosure of healthcare manufacturing firms in Nigeria.

H_i: Firm leverage significant affects on environmental disclosure of healthcare manufacturing firms in Nigeria.

Table 5: Panel Least Square Regression Analysis

Dependent Variable: EVD
Method: Least Squares
Date: 12/31/23 Time: 23:29
Sample: 2012 2022
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.768671	0.635229	1.210069	0.2571
LEV	0.002489	0.010551	0.235930	0.8188

R-squared	0.306147	Mean dependent var	0.909091
Adjusted R-squared	0.104281	S.D. dependent var	0.700649
S.E. of regression	0.736276	Akaike info criterion	2.388541
Sum squared resid	4.878916	Schwarz criterion	2.460886
Log likelihood	11.13698	Hannan-Quinn criter.	2.342938
F-statistic	0.055663	Durbin-Watson stat	0.979462
Prob(F-statistic)	0.818768		

Source: E-Views 10.0 Regression Output, 2025

Table 4.5 shows that there is an insignificant positive relationship between environmental disclosure (EVD) and firm leverage (LEV) of healthcare firms in Nigeria. This can be observed from the beta coefficient (β_1) of 0.002, t-statistics of 0.236 with p-value of 0.819 which is positive but not significant at 5%. The F-statistic of 0.055663 with an associated Prob (F-statistic) of 0.818768 is not statistically significant at 5%, which reveals that the model is well fitted, while the coefficient of determination R^2 of 0.070, explains the individual variation of the dependent variable (EVD) as a result of the changes in the independent variable (AGE). It can be said firm leverage has combined predictive power of 30% in affecting environmental disclosure of healthcare firms in Nigeria, while the remaining 70% is accounted for by other factors which are not captured in the model.

Decision: Since the P-value of the test = 0.819 is greater than 0.05 (5%). this study upholds that firm leverage does not significantly affect environmental disclosure of healthcare firms in Nigeria at 5% level of significance. Thus, null hypothesis is accepted and alternative

hypothesis rejected. The result is in agreement with Olurankinse and Mamidu (2021) results showing that during pre IFRS period, firm age have no significant relationship with environmental disclosure quality. While disagreed with Kabiru (2020) who documented that firm age, firm size and leverage has significant impact on quality of environmental disclosure. The result was confirmed by Abubakar (2017) who found that leverage has insignificant influence on environmental disclosure, and disagreed with Olurankinse and Mamidu (2021) results show that during pre IFRS period, leverage ratio has significant positive relationship with environmental disclosure quality; Kabiru (2020) revealed that firm age, firm size and leverage has significant impact on quality of environmental disclosure.

CONCLUSION AND RECOMMENDATIONS

The study determined the effect of firm attributes on environmental disclosure of healthcare manufacturing firms in Nigeria using firm size, firm age and firm leverage as the proxy for firm attribute. Data for the study were extracted from annual reports and accounts of the sampled firms. Regression analysis was employed to test the three hypotheses. The study found that firm size, firm age and firm leverage has positive effect on environmental disclosure of healthcare firms in Nigeria but this effect was not statistically significantly at 5% level of significance. This shows that older firms, large firms, and high leveraged firms disclose more environmental information. The study therefore concluded that firm attributes have positive effect on environmental disclosure of healthcare firms in Nigeria.

Based on the findings, the following recommendations were made;

1. The large firms disclose more environmental information so that they can inform the community and society that they care about the environment.
2. As a firm becomes older, it should be willing to voluntarily express how much effort and commitment it has made in ensuring sustainable development towards the environment in which it operates.
3. A firm with a moderate level of financial leverage should disclose its environmental commitment towards assuring the populace that the firm is financially buoyant.

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