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Corporate Attributes and Environmental Accounting Disclosure of Listed Pharmaceutical Companies in Nigeria

Oluwapomile Joseph Obamoyegun
Post Graduate Student, Department of Accounting, Afe Babalola University, Ado Ekiti, Nigeria
Israel Seriki Akinadewo
Lecturer, Department of Accounting, Afe Babalola University, Ado Ekiti, Nigeria
Olusola Esther Igbekoyi
Lecturer, Department of Accounting, Adekunle Ajasin University, Akungba, Ondo State, Nigeria
Omobolanle Abike Ajibola
Post Graduate Student, Department of Accounting, Afe Babalola University, Ado Ekiti, Nigeria

Abstract:
Resource consumption and the continuous emission of greenhouse gases in Nigeria have been experiencing an upward trend. Consequently, stakeholders are advocating for more transparency in corporate practices, especially those that negatively affect the environment. The research aimed to evaluate the impact of corporate attributes and environmental accounting disclosure within the context of publicly listed pharmaceutical companies in Nigeria. The research methodology used in this study was ex post facto. Using a census sampling methodology, the population consists of seven pharmaceutical enterprises officially listed on the Nigeria Exchange Group (NGX) as of December 31, 2022. The data used in this study was extracted from the verified annual financial reports of the businesses from 2010 to 2022. The collected data were analyzed with the panel data regression model employing ordinary least squares. The findings indicate that the characteristics of corporations have a notable and favourable influence on the extent to which organizations disclose information related to environmental accounting. According to the study, there is a weak and harmful correlation between leverage and environmental accounting disclosures. According to the study, Leverage and environmental accounting disclosures have an inactive and adverse relationship. Conversely, industry size and profitability show a strong, favourable relationship with these disclosures. The study's results indicate that the extent of information disclosure on environmental accounting by pharmaceutical businesses is significantly influenced by their company size and level of profitability. It is recommended that enterprises expand in terms of scale and profitability to ensure the submission of financial reports that adhere to worldwide standards of excellence.

Keywords: *Environmental accounting disclosure, corporate size, profitability, leverage, corporate attributes*

1. Introduction

Globally, environmental problems like Fossil fuel combustion's greenhouse gas emissions, pollution emissions, sewage pollution from industries, hazardous waste management, the use of embodied resources, chemical contamination, and waste management in the industrial and agricultural sectors, among others, have been addressed as a result of economic improvement efforts (Nwobu et al., 2021). According to Hassan (2021), environmental violations have raised concerns among the appropriate parties because they have enhanced social awareness, which has raised the stakes for enterprises in terms of their obligation to protect the environment in the course of doing business. The concern between economic advancement and environmental issues has also become a matter of wider discourse in several fora (Agustinus et al., 2023). This has equally encouraged active voices from diverse quarters, including environmental activists, on the consequences of the adverse effect on business growth (Kusuma et al., 2023). Therefore, emissions from business activities are significant contributors to global warming and climate change and are the main cause of this problem. The problem of the pharmaceutical industry is complicated by the rise of antibiotic resistance. Nikolaou et al. (2017) noted that there is circumstantial proof that exposure to antibiotics has led to the development of antibiotic-resistant microorganisms in the environment. Through the industrial release of toxic substances, fluids, noises, and carbon emissions, organizations are pretentiously accountable for environmental deterioration (Gani & Sharma, 2019; Chowdhury et al., 2020).

The adverse effects of environmental conditions in Nigeria and other developing countries on overall life expectancy are well acknowledged. Significant quantities of waste generated by the pharmaceutical industry are consistently discharged into the environment, with less consideration given to the specific consequences of such disposal on ecosystems, biota, and human populations. According to Yakhon and Dorweiler (2019), several aspects of the ecosystem are impacted by economic activity. These include contamination of the air, water, and drinking water, as well as changes in land use, habitat degradation for vulnerable and endangered species, and pollution of oceans, atmosphere, and land. The problem of insufficient or lacking environmental information in Nigerian companies' annual reports that are susceptible to contamination has raised concerns among relevant parties. Based on a study conducted in 2013 by the International Finance Corporation (IFC), there is a growing trend among businesses to seek transparency and accountability in their social and environmental practices, as shown by their heightened interest in monitoring and disclosing such performance to stakeholders and the wider public. Industrial companies encounter various challenges, including the management of environmental concerns and the inclusion of such issues in their annual reports. These challenges have assumed a comprehensive nature, leading to an increased demand for information from stakeholders. This information is crucial in assessing the level of social, environmental, and economic responsibility exhibited by firms towards society.

The extant literature contains studies that have endeavoured to tackle the disputes about environmental accounting reporting concerns. However, it is worth noting that these studies have encountered significant disagreement and conflicts of interest among many parties. Nevertheless, the research yielded inconsistent results. Prot et al. (2021) researched the connection between corporate features and environmental disclosure in the extractive industry. Their findings indicate that the organization's age, size, capitalization, and ownership structures of the company are all important factors that favourably affect environmental disclosure. Although seemingly significant, the influence of business type and firm profitability determinants on environmental disclosure is ultimately negligible. Shaibun (2020) and Odoemelam and Okafor (2019) have conducted research that indicates the absence of substantial evidence supporting a significant correlation between company qualities and the disclosure of environmental accounting. Limited evidence was discovered regarding the undertone between firm characteristics and environmental information in the context of Nigerian-listed pharmaceutical companies. Corporate age, financial leverage, and profitability were utilized as proxies to examine the factors influencing voluntary environmental accounting disclosures. However, the available evidence was insufficient to establish a conclusive relationship.

Numerous studies have been carried out to look at the results of company characteristics and environmental accounting disclosure processes. However, there is a dearth of research specifically focusing on the Nigerian pharmaceutical sector. In Nigeria, a study conducted by Bassey et al. (2018) studied the correlation between corporate features and environmental accounting revelation by focusing solely on profit as a company attribute. Similarly, the study carried out by Asaolu et al. (2019) evaluated the sustainability reporting practices within the Nigerian Oil and Gas sector. Likewise, Oyewo and Badejo (2020) employed a 30-item checklist to investigate the sustainable development reporting practices of banks in Nigeria. Nwobu (2019) utilized content analysis, while Onyali et al. (2019) collected primary data to explore sustainability reporting in Nigerian entities. However, it is evident that the existing body of rese

This research aims to address the existing gaps in the literature about pharmaceutical companies in developing countries and their practices of hazardous waste disposal, which have significant implications for the environment. In their study, Uwuegbe (2019) examines the relationship between organization characteristics, namely profitability, capital structure, and business size, and the amount of environmental accounting disclosure practices. The author used data spanning five years to conduct their analysis. This research aims to assess the correlation between corporate attributes, specifically corporate age, profitability, and leverage, as the independent variables and the dependent variable, which will be measured using dichotomous variables extracted from the disclosed financial information of pharmaceutical organizations listed in Nigeria. The research will cover the retro from 2013 through 2022, thus providing a rationale for the existence of the sectorial divide. The study would provide policymakers with more understanding, enabling them to develop effective guidelines and legislation to regulate environmental impacts and safeguard organizations from non-compliance. Additionally, the research would enhance investors' understanding of the significance of adhering to environmental regulations in safeguarding their interests in the organization.

The study aims to enhance the understanding of stakeholders and scholars on the impact of business features on environmental accounting disclosure. Furthermore, it aids existing investors in determining the level of social responsibility linked with the operational contexts in which the organization functions. Moreover, this research endeavour will aid regulators and policymakers in formulating effective regulations to mitigate the impact and consequences of environmental reporting. Additionally, it will contribute to the existing body of knowledge by presenting supplementary empirical data about the efficacy of environmental accounting disclosure. The main goal of this study is to evaluate the extent of knowledge and understanding among Nigeria's pharmaceutical companies about environmental accounting practices within the Nigeria Exchange Group (NGX). To do this, the study will focus on the following particular goals:

- In the context of listed pharmaceutical enterprises in Nigeria, the goal of this study is to evaluate the influence of corporate size on the amount of environmental accounting disclosure.
- This study aims to examine how pharmaceutical industries listed on the stock exchange's environmental accounting disclosure levels are affected by profitability.
- The purpose of this study is to ascertain how leverage affects environmental accounting disclosure in Nigerian pharmaceutical companies that are publicly listed.

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- This research's goal is to ascertain in what way leverage affects environmental accounting disclosure in Nigerian pharmaceutical establishments that are publicly listed.

2. Theoretical Framework

2.1. Conceptual Review

This section will give explanations of the concepts of this study and thereby present the connection between corporate attributes and environmental accounting disclosure.

2.2. Environmental Accounting Disclosure

The practice of including environmental costs in an organization's financial reporting framework is often known as environmental accounting disclosure (EAD). In 2006, KPMG and the United Nations Environmental Programme (UNEP) jointly established a definition for Environmental Accounting (EA). EA is characterized as a comprehensive system that provides organizations with a standardized framework to identify and assess environmental costs incurred in the past, present, and future. The primary objectives of EA are to facilitate informed management decision-making, enable effective control measures, and promote transparent public disclosure of environmental information. Numerous scholarly works have addressed the topic of environmental accounting (EA) using several approaches, for instance, social accounting, environmental accounting, and corporate social responsibility (Cooper et al., 2018). Nevertheless, since they all focus on addressing the financial implications of environmental factors, the core significance remains unchanged. Environmental accounting may be used by an organization to assess the impacts of its activities on the host community. This encompasses both the expenditures and revenues recognized over a certain financial reporting period rather than only focusing on the outlays.

Environmental accounting information encompasses various costs and expenses incurred during a production process, such as the utilization of chemicals, labour costs (including salaries and wages), expenses associated with materials, disposal, fines and penalties, regulatory fees, maintenance, cost savings attributable to the use of eco-friendly techniques, and costs associated with compliance with laws and regulations. Alok et al. (2018) (as cited in Olayinka and Oluwamayuwa 2019) define “environmental disclosure” as a comprehensive term including various approaches used by enterprises to communicate information on their environmental initiatives to diverse stakeholders via financial statements. Based on the above-described criteria, the term "environmental disclosure" pertains to instances when a firm is either voluntarily motivated by legal requirements or legally obliged to reveal information on their environmental management and expenditures for environmental development in their annual reports. Dibia and Onwuchekwu (2019) assert that corporations may endeavour to shape public perception of their activities via the dissemination of environmental data. According to the Ministry of Environment Japan (2002), a company can exert influence on many stakeholders, such as customers, investors, and local communities, by publicly disclosing the quantifiable statistical results of its environmental conservation initiatives.

Two assessment approaches have come to the fore in the expanding body of literature aimed at evaluating the content, and occasionally the quality, of company environmental reporting: reporting indices and surveys, each of which explains certain facets of the practice and occasionally produces conflicting results: Reporting surveys monitor reporting by evaluating stakeholder opinions on businesses' environmental reporting methods through interviews or questionnaires. Based on discussions with financial analysts, the Reporting Index was created to contain several components and a score scale of 1-4. Numerous studies have used the same approach, albeit it has been expanded upon and changed, to gauge the proficiency of corporate financial disclosure in other nations. This technique will be used in this study to assess the amount of EAD by measuring the level of the disclosure using already existing disclosure indices from professional organizations.

2.3. Corporate Attributes

Corporate attributes are factors that are mostly under the direct mechanism of management (Chu-Chun et al., 2019). The Corporate attributes are the precise indicators that include corporate size, leverage, profitability, liquidity, growth rate of premium, underwriting risk, and listing age of the company. The corporate entity is distinguished from one another based on certain features they possess. Such features are known as corporate attributes, which occur at the corporate level and can influence corporate decision-making. Corporate size, leverage, and profitability as corporate attributes adopted for this study cut across the two forms of classification in order to give a detailed view of the connection between corporate traits and environmental accounting information. Corporate size and leverage are classified under corporate reporting attributes, while profitability falls under corporate performance attributes. The above attributes are discussed in the subsequent sections.

2.4. Corporate Size

Corporate size is determined by a company's market capitalization, total capital invested, total assets held, and total revenue generated. Companies with more overall assets may undoubtedly make more money. Additionally, big businesses have more bargaining leverage with clients and suppliers and have simpler access to markets abroad. Corporate size has been noted as one of an entity's key characteristics; it greatly affects the organization's operational and administrative structure. It is believed that a company's size affects the amount of resources at its disposal, enables it to take advantage of investment possibilities, and enables it to employ the best personnel to manage its business.

Strong support for the hypothesis that a firm's size and environmental performance are positively correlated is provided by Shuchi (2019). Similarly, the research conducted by Dienes et al. (2021) demonstrates that the size of a corporation is among the most influential variables affecting the extent to which sustainability reports are disclosed. According to Haddad et al. (2021), the size of a corporation has consistently influenced the extent of its environmental disclosure. Conversely, Chandok and Singh (2021) argue that there exists a connection between firm size, systemic risk, and the presence of environmental disclosure on a company's website, as well as the overall extent of disclosure.

2.5. Leverage

The ratio of debt to equity is referred to as leverage. It displays management choices for the best combination of funding possibilities. Due to their fixed-interest financing, organizations with more leverage are typically perceived as riskier. High-leverage businesses are, therefore, likely to face survival threats if they cannot demonstrate that they are environmentally conscious. The ratio of total liabilities to total assets respects leverage. The ratio of debt to equity is referred to as leverage. It presents management options for the most advantageous finance options. Organizations with higher levels of leverage are often thought of as riskier due to their fixed-interest funding. Therefore, high-leverage companies may face survival challenges if they are unable to show that they are environmentally conscientious. Leverage is measured by the ratio of total liabilities to total assets. It illustrates how heavily a business relies on borrowing money. If they are unable to repay their debt payments, highly leveraged businesses run the danger of going bankrupt. They may also have trouble finding new sponsors shortly. Because it may boost shareholders' returns on their assets and effectively use the tax benefits of borrowing, leverage is not necessarily a negative thing.

Several research, like Andrikopoulos et al. (2021) and Christopher and Filipovic (2018), have revealed an association between financial leverage and environmental disclosure. In general, findings suggest that organizations with a high level of leverage tend to communicate extensively about environmental concerns as a means of demonstrating their commitment to corporate citizenship and mitigating potential environmental liabilities. This behaviour aligns with the principles of legitimacy theory.

2.6. Profitability

Profitability is the term used to describe the residual revenue that remains after subtracting the expenses associated with producing products or rendering services. Profitability is a company feature that has been identified as having a substantial influence on the environmental accounting reporting of organizations. Several studies (Ahmadi & Bouri, 2021; Li et al., 2019; Marquis & Qian, 2019; Sharif & Rashid, 2019; Vitezic et al., 2021; etc.) have shown that the disclosure of social and environmental information and corporate profitability are positively correlated. This finding contradicts the perspectives of Kolsi (2019) and Aljifri et al. (2021), who contend that corporate profitability plays a crucial role in shaping corporate disclosure policies. In contrast to the findings of Bowrin (2019) and Dienes et al. (2018), no significant correlation is shown between corporate profitability and transparency. The study that was done by Andrikopoulos et al. (2020) and Michelon (2021) did not establish a correlation between a corporation's profitability and the level of its environmental disclosure. Similarly, Nor et al. (2019) did not find any empirical evidence supporting a link between environmental disclosure and firm profitability.

2.7. Corporate Attributes and Environmental Accounting Disclosure

The size of the organization has a crucial impact on decision-making when an industry's operational context is taken into account. A company's ability to include environmental disclosures in its annual reports may depend on the size of the organization. The results of earlier researchers' investigations are given in this publication as findings. According to research on corporate social responsibility and environmental disclosure conducted by Setyorini and Ishak, the quantity of disclosure is positively connected with firm size (2020). According to Cormier et al. (2019), corporation size plays a major role in determining environmental disclosure. According to Nawaiseh (2018), a corporation's size and the extent of its environmental disclosure are significantly correlated. Jariya's 2018 research focused on the variables that influence how much environmental information is provided in the annual reports of industrial firms that are listed on the Sri Lankan stock exchange. The findings demonstrated a positive correlation between business size and the extent of corporate environmental disclosure. Burgwal and Vieira (2020) discovered a positive association between the size of Dutch-listed enterprises and the depth of their environmental disclosure when they looked into the variables impacting environmental disclosure. Although there was a shaky association between a corporation's size and the depth of its environmental disclosure, Dibia and Onwuchekwu (2021) observed that their investigation failed to uncover this correlation. According to Gatimbu and Wabwine, the size of a company and the scope of its environmental disclosure were shown to be negatively correlated in 2019.

Numerous writers have conducted studies to discover the factors that affect environmental disclosure among firms, and one factor that is frequently ignored is leverage. The results were inconsistent with those predicted by earlier investigations. Leverage does not affect a company's capacity to disclose environmental information, according to Ohidoa et al. (2019), Dibia and Onwuchekwu (2020), Prastiwi et al. (2020), and Suleiman et al. (2021). According to Juhmani (2021) and Agbdan (2020), a company's leverage can have a favourable impact on its ability to make the environmental information in its annual reports accessible.

Profits are available for the business to practice corporate social responsibility and preserve the environment. The dividend that is given to the shareholders is also funded by earnings. The aforementioned are not made possible without profit. As a result, a company's capacity to share environmental information is greatly influenced by its profitability. The following findings from research on the factors influencing environmental disclosure, which used profitability as one of the proxy measures, are available. Profits are available for the business to practice corporate social responsibility and preserve the environment. The dividend that is given to the shareholders is also funded by earnings. The aforementioned are not made possible without profit. As a result, a company's capacity to share environmental information is greatly influenced by its profitability. The following findings from research on the factors influencing environmental disclosure, which used profitability as one of the proxy measures, are available. Jariya (2020) asserted that environmental disclosure is impacted by profitability. In their investigation of the factors influencing the quality of environmental reporting in Malaysia, Suleiman et al. (2019) employed regression to evaluate the data. The findings showed that profitability was not significantly correlated with the quality of environmental reporting. Agbdan (2020) discovered that environmental disclosure had a negative association.

3. Theoretical Review

The legitimacy theory promoted by Edward Freeman (1984), which serves as the foundation for the study's goal, is the theory that is explored in this investigation.

3.1. Legitimacy Theory

The validity hypothesis was formulated in 1975 by Dowling and Pfeffer. The basic tenet of legitimacy theory is the fulfilment of the social compact inside an organization; this makes it possible to understand its goals. Legitimacy is the belief or presumption that a course of conduct is acceptable and aligns with socially accepted norms, values, beliefs, and meanings (Cho et al., 2018). The idea supports the practice of businesses sharing environmental accountability data to build a reputation as socially responsible and to justify their choices to various stakeholder groups. The idea that there is a social compact between society and business serves as the cornerstone of legitimacy theory. A company's value system is said to be legitimate when it is in line with the wider social system of which it is a part. The legitimacy of the firm will be in jeopardy when there is a genuine or possible conflict between the two value systems. The business believes its existence and actions are justified by outlining its social and environmental initiatives. Corporate companies must convey environmental operations by revealing social settings to maintain their credibility (Berthelot & Robert, 2019; Antara et al., 2021). The idea of the social compact served as the inspiration for legitimacy theory. It outlines how organizations respond to expectations that are typically set and are dependent on how the organization is seen by all stakeholders (Mahmud, 2019)

Environmental accounting information is also a way for industries to be transparent about their environmental actions. It demonstrates their care for stakeholders, their duty to the environment, and their commitment to its preservation, all of which will help them gain credibility (Ifada et al., 2021). Contradictory research is also offered, while several supporters of the legitimacy theory in accounting study have been mentioned in the prior sections. According to O'Dwyer, B. (2020), concerns about legitimacy infrequently drive significant Irish corporations to provide social and environmental information. Campbell (2020) noted that human factors appeared to be better equipped to explain the firm's disclosure policies. The legitimacy argument, which Guthrie, J. and Parker, L.D. (2019) used to justify why they disseminate knowledge concerning society and the environment, was also unsupported by any evidence. As a result, the data suggest that it is difficult to draw a link between the idea of legitimacy and the dissemination of environmental information. Numerous studies show that the legitimacy theory can be applied in accounting research, but more evidence points in the other direction. Therefore, it is important to admit that there is scant empirical support for the legitimacy theory's conviction and confidence in accounting research. This is the guiding idea since the critic has little impact on the research.

3.2. Empirical Review

The research conducted by Nguyen and Tran (2019) sought to evaluate the link between performance in terms of money and the transparency of accounting information for the environment. Data were gathered between 2013 and 2017 from companies that were listed on the Vietnam Stock Exchange. Both companies that reported their environmental accounting information and those that chose not to do so were included in this dataset. Two regression models were employed in the examination of the relationship between environmental accounting data and return on assets. The findings of the study show a significant relationship between financial success and the level of environmental accounting information disclosure, organizations that revealed environmental accounting data and those that did not have significantly different financial performances.

Zamil and Hassan (2019) conducted a study spanning from 2013 to 2017 to look at how Fortune 500 companies' financial results are affected by environmental reporting. Three independent variables—a decline in water usage, a drop in waste production, and a reduction in greenhouse gas emissions—were used to measure the project's financial performance. The intended audience for this study consisted of the top 100 Fortune 500 corporations that are respected for their corporate social responsibility (CSR) practices. However, due to practical limitations, a sample size of 50 organizations was selected for observation from a larger pool of 250 organizations. Regression, correlation, and descriptive statistics were used to examine the data. The decrease in waste, as one of the designated factors, had a detrimental and considerable effect on the financial performance. Conversely, another factor that positively and noticeably affected the financial performance was the reduction in water use and greenhouse gas emissions.

In their study, Ofoegbu et al. (2018) analyzed data obtained from the annual reports of 213 environmentally aware enterprises in South Africa and 90 such firms in Nigeria for the year 2015. They wanted to find out how board characteristics affected how much information was disclosed about the environment. The legitimacy and stakeholder theories served as the research's foundation. The results show that the corporate size and liberation of the board have a big effect on how much information is disclosed about the environment. However, the research is subject to several limitations since it relied on cross-sectional data and did not adequately consider the temporal dimension.

In their study, Abubakar and Moses (2020) researched to evaluate the relationship between corporate governance traits and environmental disclosure. Data from 20 listed industrial businesses in Nigeria were collected between 2012 and 2018.

Regression study results show that board independence has a considerable beneficial impact on the sample firm's environmental disclosure. However, it was observed that diversity in terms of country and experience had no statistically meaningful effect on the way the corporation disclosed its environmental practices.

In their 2018 study, Hussain and Ammara looked at the performance of non-financial businesses listed on the Pakistani stock exchange and the connection between environmental accounting and it. The present research was undertaken by using annual data from companies from 2006 to 2016 and utilizing the regression analysis approach. The findings of the empirical investigation revealed a significant positive association between environmental accounting and the scope of economic operations. According to the statistical data, the earnings per share and return on capital utilized were not very significant.

The study conducted by Hannifa and Cooke (2019) investigated the influence of corporate governance and profitability on the degree of environmental disclosure at publicly traded companies in Malaysia. A sample of 226 publicly traded companies from 1999 to 2000 was used in the analysis of the data, for which conventional least square regression was used. The investigation's findings showed a strong and favourable correlation between a firm's profitability and the degree of its environmental revelation.

In the research conducted by Fan (2006), the author examined the many elements that exerted influence on the practice of environmental disclosure inside Chinese enterprises over the period spanning from 2000 to 2004. A representative sample of 226 Malaysian-registered businesses provided the data. To examine the results, multiple linear regression analysis is employed. The data display that voluntary environmental disclosure is significantly influenced by profitability. In contrast, Smith (2007) conducted a study using a sample size of 148 enterprises and data spanning six years (2001-2005) to investigate the use of accounting principles in addressing environmental concerns. The data analysis using ordinary least square regression reveals a substantial negative correlation comparing asset returns and environmental transparency of enterprises in Malaysia.

The study conducted by Innocent and Gloria (2018) investigated how company-specific factors affected the corporate environmental performance of Nigeria's listed industrial goods companies. The study focused on the effects of organization age, profitability, and size on the costs of waste management for producers of industrial goods. Ex-post-facto research methodology was used for the investigation. In 2017, the study's population and sample size consisted of eleven publicly listed industrial goods businesses on the Nigerian Stock Exchange. During the period of investigation, from 2008 to 2017, the annual reports and financial statements of the chosen organizations served as the source of secondary data for this study. To conduct data analysis, the researchers used multivariate regression analysis and computed the Pearson correlation coefficient. The outcomes of the study demonstrated that several corporate variables, including firm age, firm size, and firm profitability, were all shown to have an effect.

The study by Abubakar (2019) looked at the effects of corporate factors on the environmental disclosure practices of publicly traded beer firms in Nigeria. The study's sample includes five brewers that are listed on the Nigerian stock market. The chosen firms' annual reports from 2012 to 2016 provided the information for this study. The method used to analyze the data was multiple regression. Proxies for profitability (PROF), firm size (FRMS), leverage (LEV), and board size (BDS) were used to assess the characteristics of the organization. Environmental disclosure continues to be evaluated through the assessment of the contents. According to the research's findings, the size of a corporation has a favourable, if little, impact on how much information is disclosed about the environment. On the other hand, the degree of leverage shows a negative and statistically negligible effect. The board's size has a considerable negative impact as well.

In their study, Egbunike and Tarilaye (2019) studied the relationship between some corporate features (like company size, earnings, leverage, and management) and the volume of voluntarily disclosed environmental information. A sample of manufacturing businesses listed in Nigeria provided the data for this study. Information on business size, earnings, leverage, and governance was obtained from a sample of manufacturing businesses' annual reports and financial statements from 2011 to 2015. Data analysis techniques included both descriptive and inferential statistics. At first, it was evident that some of the evaluated industrial enterprises had high-leverage profiles while others showed low-leverage profiles. Furthermore, the management structure and environmental information dissemination are strongly correlated, as are business size, leverage, and profitability per share. It was noted that although some businesses did not include any environmental-related information in their annual reports and financial statements, others did so in great detail and included monetary values.

According to Omar (2014), the study used data from 2012 and a sample size of 33 publicly listed businesses. To evaluate the various aspects that influence Bahrain's degree of corporate social and environmental disclosure, multiple linear regression analysis was used. The results displayed that age had little bearing on voluntarily disclosed environmental information.

In their study, Khalid et al. (2020) evaluated the potential effect of business attributes on the level of Corporate Social and Environmental Disclosure (CSED) in Jordan's manufacturing industry. The main variables that were looked at in this research were the size of the company, its profitability, the auditing firm, its ownership structure, its industry, and its position in the financial markets. Using the methods outlined by Ernst & Ernst, the research created a disclosure index to assess the volume of Corporate Social and Environmental Disclosure (CSED) across three years (2010, 2011, and 2012). The output of the panel data regression models shows a substantial correlation between the level of corporate social and environmental reporting and factors including business size, the kind of audit firm, and financial performance in the setting of the Amman Stock Exchange (ASE). However, there was no correlation between CSED and factors including age, industry, ownership, and firm profitability.

In their study conducted in Malaysia, Ahmad and Osazuwa (2019) examined the influence of a director's culture on the volume of environmental disclosures made by businesses listed on Bursa Malaysia's primary market by looking at the racial backgrounds of the board members. In the study, organizational culture is categorized. The dependent variable of environmental disclosure was assessed using an index score based on the content of the annual reports of the selected firms. The results show a strong correlation between environmental disclosure and various variables, such as corporate size, leverage, the percentage of Bumiputra directors on boards, and the percentage of directors from other nations.

The study conducted by Nguyen et al. (2021) aimed to assess the variables that affect how much environmental accounting information is disclosed in Vietnam's building sector. A total of 74 construction businesses, which are publicly listed on the Vietnam Stock Exchange, supplied environmental information for the time frame of 2013 to 2016. The levels of accounting transparency are determined by the use of quantitative research techniques. Analyzing the information and variables that influence the level that was recorded is the aim of this study. The results indicate that, specifically in the year 2016, construction enterprises exhibited a preference for disclosing a greater amount of environmental accounting information. The study's findings also imply that factors such as the firm's size, profitability, financial leverage, number of years listed, and independent audit have a big effect on how much information is disclosed.

The study conducted by Akbas (2019) considered the connection between corporate traits and the volume of environmental disclosures made by Turkish companies. The 62 non-financial businesses included in the study's sample were listed on the BIST-100 index after 2011. A content analysis was conducted on the annual reports of a selection of corporations to assess the extent of environmental disclosure during 2011. The results of the regression analysis show that profitability and the extent of environmental disclosure are negatively correlated, although corporate size and industry engagement show a positively correlated relationship. Nevertheless, the analysis reveals that neither age nor leverage had a statistically significant correlation with disclosure level.

Arif and Tuhin (2021) conducted research in Bangladesh to evaluate the factors that influence the Optional disclosure of social and environmental issues in listed banks' annual reports. Using a disclosure index, the study looked at 48 voluntary disclosures of non-financial information. An investigation was made on the impact of three distinct characteristics, namely the bank's operating tenure, size, and yearly profitability, on the amount of information disclosure regarding its environment and society using a sample of 20 publicly traded banks listed on the Dhaka Stock Exchange. The results suggest that the disclosure level of non-financial information was not influenced by the size of the bank. However, the bank's annual profitability and longevity did have an impact.

In a study conducted by Elshabasy (2019), an examination was undertaken to assess the impact of various business characteristics on the disclosure of environmental information by publicly listed firms in developing economies. This research selects the 50 most active businesses listed on the Egyptian stock market. The disclosure book's financial statements from 2007 to 2011 are utilized for the study. The findings show that the two characteristics of a company—Organization Size and Financial Leverage—and EID do not have a statistically significant relationship. Nevertheless, there exists a noteworthy negative correlation between the longevity and financial success of the company and its propensity to engage in environmentally irresponsible behaviour (EID).

Fan (2018) conducted a study in China to study the factors that influence environmental disclosure among Chinese businesses between 2000 and 2004. A representative sample of 226 Malaysian companies that are publicly traded provided the data. Multiple linear regression analysis and interpretation of the results were done statistically. According to the study's findings, how much voluntary environmental disclosure a corporation produces is significantly influenced by its profitability.

The study conducted by Ohidoa et al. (2020) was done on the elements influencing Nigeria's environmental disclosure procedures. The financial records and accounts of businesses operating in the industrial and banking sectors and listed on the Nigeria Exchange Group were used to compile the historical data. The research used the statistical technique of binary logistic panel data regression. The study's findings point to a strong correlation between company size and industry type while also arguing against a considerable influence of leverage on environmental disclosure.

In their study, Majeed et al. (2019) examined the variables that affect the amount of information publicly disclosed in Pakistan concerning publicly traded companies' environmental and social responsibilities. The research considered 49 companies that published annual reports between 2007 and 2011 made up the study's sample. The findings of the study showed that the board's size had a considerable, advantageous effect. The degree of CSR disclosure is significantly influenced by the scope of board independence, the size of the company, and the level of decentralization. Additionally, it emerges from the data that there is a negative relationship between the gender of the representatives and the amount of environmental information they share.

Umoren et al. (2021) performed research in Nigeria to assess the level of environmental information disclosure among representative companies listed on the Nigerian Stock Exchange. The findings revealed that, on average, these businesses reported around 7% of environmental information. The research used descriptive statistics, correlation analysis, and linear regression techniques. The dataset consisted of information collected over two years (2013-2014) and included a sample of 40 enterprises from eight distinct industries. The study strongly advocates for the use of integrated reporting in Nigeria. According to KPMG's study in 2013, there was a significant increase in the proportion of firms in South Africa that produced environmental reports, rising from 45% in 2008 to 98% in 2013. The observed rise in numbers might perhaps be attributed to the implementation of compulsory integrated annual reporting, enhanced corporate governance practices, and a consistent legislative framework.

3.3. Gap in Literature

Based on the empirical review of the literature, the study fills some gaps regarding relating corporate attributes and environmental accounting disclosure together in order to evaluate the studies from a new perspective and bring an in-depth view of the variables. The study will focus on corporate size, leverage, and profitability, which will be used to access environmental accounting disclosure. Studies have been conducted in wealthy nations, but little has been done in underdeveloped countries like Nigeria. The focus will be on the pharmaceutical sector of the manufacturing companies due to its hazardous nature and how their waste has been disposed into the community waterways. The studies will hinge on legitimacy theory to see its effect on corporate attributes, as several studies have stated stakeholder theory and agency theory as their underpinning theories. Based on these, the null hypotheses will be stated as follows:

- H_{01}: Corporate size does not significantly impact the disclosure of environmental accounting of the listed pharmaceutical companies in Nigeria
- H_{02}: Profitability does not significantly impact the degree of environmental accounting disclosure of the listed pharmaceutical companies in Nigeria
- H_{03}: Leverage does not significantly impact the degree of environmental accounting disclosure of the listed pharmaceutical companies in Nigeria

4. Methodology

This study will employ ex-post-facto, quantitative research methods. This is so that the study may examine how corporate characteristics affect the disclosure of environmental accounting. The population of this research consists of the seven pharmaceutical companies listed on the Nigerian Exchange Group (NGX) as of 31st December 2022. Census sampling techniques will be used to determine the sample size, thereby choosing all the seven pharmaceutical firms as specified on the NGX as of 31st December, 2022. The study used the annual financial report of the firms through the annual statistical bulletin to get the environmental disclosure needed for this study for the period of 2013-2022 to cover a range of ten years for wider coverage. Corporate size, leverage, and profitability will be evaluated for independence, and dichotomous variables will be evaluated for the dependent environmental disclosure index since an environmental disclosure index was produced and will be taken from the audited annual report. The data was analyzed using panel data regression models using ordinary least squares with fixed effects.

4.1. Model Specification

The influence of corporate characteristics on the environmental accounting disclosure of the listed pharmaceutical industry in Nigeria is assessed using a multiple linear model. The model below summarizes the contribution of corporate size, financial leverage, and profitability to environmental accounting disclosure.

$EAD_{it} = \alpha + \beta_1 CSIZE_{it} + \beta_2 LEVR_{it} + \beta_3 PROFT_{it} + \varepsilon$

Where:

EAD is the residual from the regression of the modified Jones Model by Dechow et al. (1995)

CSIZE: Corporate size measured as the natural log of total asset

LEVR: Leverage measured as the ratio of total debt to equity

PROFT: Profitability is measured as the ratio of profit after tax to total asset

α is constant

$\beta_1 - \beta_3$ is the parameter estimation coefficient.

ε is the erroneous word.

4.2. Measurements of Variables

Three independent factors and one dependent variable were evaluated and classified as follows in this study:

S/NO	Variables	Description	Measurement	References
1.	Corporate Size (INDEPENDENT VARIABLE)	Size of the firm in terms of assets it owns	Natural Logarithm of Total Assets	Nurhayati et al. (2016), Al-Shaer et al. (2017), Waweru et al. (2011)
2.	Leverage (INDEPENDENT VARIABLE)	Relationship between owner's Finances, interest-bearing obligations, or borrowed cash	Debt Equity Ratio	Chandok and Singh (2017), Waweru et al. (2021), Al-Shaer et al. (2019), Dienes et al (2019)
3.	Profitability (INDEPENDENT VARIABLE)	This serves as a gauge of the businesses' financial success.	Return on Equity	Dienes et al. (2020)
4.	Environmental Accounting Disclosure (DEPENDENT VARIABLE)	Scores the firm's environmental disclosure with a monetary value of 3, a quantitative value of 2, a general value of 1, and a 0 for non-disclosure.	Dichotomous Variable	Hossain et al. (2019), Said et al. (2019), Bowrin (2018), Kolsi (2021), Dobbs and Staden (2020), Kamal et al. (2021), Eltaib, Beck et al. (2020).

Table 1: Measurements and Variables
Source: Authors' Compilation (2024)

5. Results and Discussions

5.1. Descriptive Statistics

The explanatory and explained factors in the context of this inquiry are shown in table 2 with descriptive statistics. According to the study's findings, 57.1% of the firms that were chosen had environmental accounting disclosure (EAD), with 0% and 100% being the lowest and greatest levels, respectively. The results also show that a standard deviation of 0.8265 (82.2%) shows substantial variation among the sampled businesses. The information in table 2 indicates that pharmaceutical businesses' mean return on equity (ROE) is -1.4, with a standard deviation of 10.19%. The findings indicate that there is a significant variation in profitability among the selected pharmaceutical companies listed in Nigeria, as shown by a statistically significant standard deviation of 10.19%. The numbers range from -35% to 25%, with 25% being the highest and lowest. The reported pharmaceutical companies' average leverage number is 1.2. Furthermore, the 2.39% standard deviation indicates a considerable degree of variability in the data points relative to the mean. According to the logarithm of their total assets, pharmaceutical companies' average size was found to be 6.629%, with a standard deviation of 0.972%. This shows that there is a large amount of variation among the sampled businesses. The total assets of the firms were quantified as having a lower and upper bound of 0 and 7, respectively.

VARIABLE	OBSV	MEAN	STD. DEV.	MIN	MAX
EPP	70	.5714286	.8265772	0	2
ROE	70	-.0144464	.1119465	-.3520865	.2565148
LEVERAGE	70	1.201777	2.3977202	-15.4116	8.330253
LgSIZE	70	6.629535	.9755171	0	7.633279

Table 2: Descriptive Statistics
Source: Author's Computation (2024)

5.2. Test of Variables

5.2.1. Correlation Matrix of Dependent and Independent Variables

The correlation matrix sheds light on the relationships between each set of variable pairs in the model. The correlation matrix serves as a first assessment to ascertain the potential presence of multi-collinearity. Nevertheless, the present research included an additional examination of multi-collinearity by employing the tolerance value (TV) and the variance inflation factor (VIF) as testing metrics. The association of each pair of variables is included in table 3 for your convenience. Despite predictions that there will be little association between any two independent variables, it is anticipated that the correlation between each independent variable and the dependent variable will be strong. The rationale for this is that it is considered excessive and may indicate the presence of multi-collinearity when the correlation coefficient between two independent variables exceeds 0.8. However, based on the information in table 3, the correlation coefficient between the independent variable pairs is less than 0.8. This indicates that it is possible to effectively include the three independent variables in a single regression model.

From the correlation matrix table 3, as can be shown, the EAD of the listed pharmaceutical companies in Nigeria has a positive correlation with each of the explanatory factors (ROE, LEVERAGE, and lgsize). The implication is that the aforementioned variables follow the EPP's trajectory. In terms of associations amongst the independent variables themselves, the table shows that ROE, LEVERAGE, and lgsize have a positive connection. Last, but not least, it has not been discovered that the correlation between the variables themselves is substantial enough to allow one to draw the conclusion that multi-collinearity exists until the variance inflation factor and tolerance levels significantly deviate from the established standard. To evaluate multi-collinearity among the regressors, sophisticated metrics such as the variance inflation factor (VIF) and tolerance value are used.

	EPP	ROE	LEVERAGE	LgSIZE
EPP	1.0000			
ROE	0.3092	1.0000		
LEVERAGE	0.0617	0.1760	1.0000	
LgSIZE	0.3008	0.3624	0.1397	1.0000

Table 3: Correlation Matrix
Source: Authors' Computation (2024)

5.2.2. Post Estimation Tests

To examine the reliability of the regression model's underlying assumption, post-estimation tests were carried out. The multi-collinearity test, heteroscedasticity test, normality test, and Hausman test were all performed as part of the post-estimation test in this study.

5.2.3. Multi-collinearity Test

Multi-collinearity refers to the situation in regression analysis when two or more predictor variables exhibit a strong correlation. In this particular scenario, it is possible to make accurate predictions based on linear relationships among the variables. The exploration of multi-collinearity is facilitated by the use of the Variance Inflation Factor (VIF) value. A Variance Inflation Factor (VIF) value below 10, together with a mean VIF below 10, indicates that there is no redundancy among the independent variables, meaning that each variable serves a distinct role. Nevertheless, when the Variance Inflation Factor (VIF) exceeds a value of 10, it indicates that two independent variables fulfil a similar function, and the variable with the greatest VIF will be eliminated. The Variance Inflation Factor (VIF) was employed in the current study to determine if there was multi-collinearity among the explanatory variables. The results of the multi-collinearity test are shown in the following table.

	VIF	1/VIF
ROE	1.17	.8526
Lgsize	1.16	.8627
LEVERAGE	1.04	.9623
Mean VIF	1.12	.

Table 4: Variance Inflation Factor
Source: Authors' Computation (2023)

When the VIF value is more than 10, multi-collinearity is strongly suspected to be present. A score of less than 10 in the VIF result indicates that there is no multi-collinearity among the explanatory variables. The degree to which independent factors influence dependent variables may be predicted by the research using a regression coefficient. Therefore, it is believed that the study's findings are genuine since they are devoid of the negative effects of multi-collinearity.

5.2.4. Heteroskedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of EPP
$Chi^2(1)$ = 8.49
Prob > chi^2 = 0.0036

Table 5
Source: Authors' Computation (2024)

The heteroskedasticity test aimed to assess the presence of heteroskedasticity, which violates the assumption of homoscedasticity in a regression model. According to the homoscedasticity hypothesis, the error term variance is constant at all levels of the independent variables. A false conclusion might result from a breach of the homoscedasticity assumption. The aforementioned result demonstrates the existence of heteroskedasticity based on the observed probability value of 0.0036, which is over the significance level of 1%. This suggests that the error component has a homogeneous distribution and that its value is constant across the residuals. A panel-corrected standard error regression test was run on the regression outcome to reduce the occurrence of heteroskedasticity, and the results were satisfactory for further research.

5.3. Data Distribution with Normality

The model's residuals were thus subjected to a normality test in this investigation utilizing Shapiro-Francia.

Shapiro-Francia W's Test for Normal Data					
VARIABLE	OBSV	W'	V'	Z	Prob>z
EPP	70	0.99273	0.495	-1.359	0.91299
ROE	70	0.88629	7.739	3.952	0.00004
LEVERAGE	70	0.42602	39.066	7.079	0.00001
LgSIZE	70	0.58851	28.007	6.436	0.00001

Table 6: Shapiro-Wilk W Test for Normal Residual
Source: Author's Computation (2024)

As seen in table 6 for the Shapiro-Francia test, the p-values for all models—aside from EAD—are less than 1% significant level. The result is less than 0.05, as indicated in the table, at a 5% level of significance. Hence, the null hypothesis that the residual is normally distributed across the models cannot be disproved.

5.4. The Hausman Test

Test: Ho: unsystematic variation in coefficients
$Chi^2(3)$ = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.62
Prob>chi^2 = 0.8908

After assessing the model in a fixed and random way, the researcher performed a Hausman specification test. The Hausman specification test determines that the fixed effect model is preferable over the random effect model. The Hausman specification test run on the model yielded a p-value of 0.8908, which is negligible at 5%. It follows that the variation across entities is assumed to be random and related to the independent variables present in the model. As a consequence, the outcome of the random effect model was deemed appropriate for the research.

5.5. Panel Corrected Standard Error (PCSE) Result

Heteroskedasticity, characterized by substantial fluctuations in the variance of the error term inside a regression model, was identified after doing all post-estimation tests. To ensure compliance with the regression assumptions and establish the reliability of the findings, the research used a panel-corrected standard error (PCSE) model, which effectively mitigates the issues arising from heteroskedasticity. Heteroskedasticity is a challenge since it violates the assumption of constant variance in the ordinary least squares (OLS) regression, where it is expected that all residuals are sampled from a population with a consistent variance. The Panel Corrected Standard Errors (PCSE) model used in this study's findings is offered together with its conclusions addressing the challenges mentioned before. The study presents the results of the regression analysis conducted using the panel-corrected standard error (PCSE) regression technique, as shown in the table below.

Standard errors were addressed using linked panels and linear regression (PCSEs)						
Group variable:	Companies ID		Number of Obs	=	70	
Time variable:	Year		Number of group	=	7	
Panels:	correlated (balanced)		Obs per group:			
Autocorrelation:	no autocorrelation		min =	10		
			avg =	10		
			max =	10		
Estimated covariances	=	28	R-squared	=	0.1367	
Estimated autocorrelations	=	0	Wald chi² (3)	=	21.47	
Estimated coefficients	=	4	Prob> chi²	=	0.0001	
EID	COEF.	PANEL-CORRECTED STD. DEV	Z	P>|Z|	[95% CONF	INTERVAL]
ROE	1.711564	.6532515	2.62	0.009	.4312143	2.991913
LEVERAGE	-.0033069	.0184127	-0.81	0.857	-.0393951	.0327813
LgSIZE	.1847928	.1169938	1.58	0.114	-.0445109	.4140965
CONS	-.6249618	.7699422	-0.81	0.417	-2.134021	.8840972

Table 7: The Panel Corrected Standard Error Regression
Source: Authors' Computation (2024)

Profitability (ROE), leverage, and corporate size (Lgsize) all together accounted for 13.7% of the environmental accounting disclosure (EAD) of listed pharmaceutical enterprises in Nigeria, according to the cumulative correlation of 0.1367 between the dependent variable and all the independent factors. The p-value of 0.000 indicates that this explanation is statistically significant at 1%, while the remaining 86.3 % is attributable to additional factors that were not taken into account by the model.

In addition, the Panel Corrected Standard Error regression showed that profitability measured with ROE has a positive and significant effect (r =1.7115, p = 0.009) on the environmental accounting information of listed pharmaceutical firms in Nigeria. Leverage and firm size have negative and positive effects (r = -0.0033, p = 0.857; r =0.1847, p = 0.114) respectively. At a 5% insignificant level, the environmental accounting information of listed pharmaceutical enterprises in Nigeria is negligible.

The obtained coefficient revealed a positive relationship (r = 1.7115, p = 0.009) between profitability and environmental accounting disclosure (EAD) of listed pharmaceutical firms in Nigeria, indicating that as profit or financial performance of pharmaceutical firms increases, the more they disclose environmental accounting. This implies that the level of environmental accounting disclosure increases in direct proportion to the success of pharmaceutical enterprises. Another common indicator that appears to favourably influence environmental accounting disclosure is the business size of listed pharmaceutical businesses in Nigeria (EAD). A company's expansion may increase this disclosure because the environmental accounting disclosure (EAD) for listed pharmaceutical businesses in Nigeria was positively impacted by business size. Last but not least, although it is not significant, leverage negatively affects the environmental accounting disclosure (EAD) of pharmaceutical companies that are listed on the Nigerian Exchange Group. So, it can be said that corporate traits like profitability (ROE), leverage, and firm size significantly affect how listed pharmaceutical companies in Nigeria report their environmental accounting.

6. Discussion of Findings

The results of this research are in line with those of Nguyen and Tran (2019), who looked at the relationship between monetary performance and the quantity of environmental accounting information reported. The results demonstrate a strong correlation between financial success and the amount of environmental accounting information supplied. Environmental accounting was the subject of a study by Hussain and Ammara (2018) that looked at the performance of non-financial companies listed on the Pakistan Stock Exchange. An empirical investigation found a substantial beneficial association between environmental accounting and a corporation's size. To better understand how business variables affect the amount of environmental disclosure made by listed beer firms in Nigeria, Abubakar (2019) carried out a study. The approach for data analysis that was employed was multiple regression. As substitutes for evaluating corporate attributes, profitability (PROF), firm size (FRMS), leverage (LEV), and board size (BDS) were utilized. Environmental disclosure continues to be evaluated through the assessment of the contents. According to the study's conclusions, listed breweries in Nigeria have a positive, albeit statistically insignificant, influence on environmental disclosure. However, in the same setting, profitability has a favourable and statistically significant impact on environmental disclosure. Leverage has been proven to negatively affect environmental disclosure while statistically having no effect.

According to the findings of Arif and Tuhin (2021) in their research conducted in Bangladesh, they arrive at a contrasting result on the factors that impact voluntary disclosure about environmental and societal aspects in the annual reports of publicly listed banks, as compared to the conclusion reached in the present study. The research used a disclosure index to analyze 48 voluntary non-financial information releases. A study was carried out on a sample of 20 publicly traded banks on the Dhaka Stock Exchange to determine the impact of three distinct characteristics, namely the bank's operational longevity, size, and annual profitability, on the volume of information the bank disclosed regarding its environment and society. The findings show that the amount of non-financial information disclosure and the bank's yearly profitability and operating history are significantly correlated. However, it does not appear that the bank's size much affects this disclosure.

7. Conclusion

By concentrating on the following goals, this study intends to determine the level of environmental accounting knowledge of the Nigeria Exchange Group (NGX) within the Nigeria Pharmaceutical industries: analyze how corporate size affects the environmental accounting disclosure in Nigerian listed pharmaceutical businesses; Investigate the relationship between profitability and the regulations governing environmental accounting disclosure in listed pharmaceutical industries in Nigeria, as well as the impact of leverage. Corporate size, leverage, and profitability were examined for independence; dichotomous variables were measured for the dependent environmental disclosure index. The findings indicated that leverage had a negative influence on environmental accounting disclosure in Nigeria's listed pharmaceutical industry, whereas profitability and company size had a positive impact. Based on the findings of the regression analysis, this research came to the conclusion that corporate traits had a positive and substantial influence on the environmental accounting disclosure of listed pharmaceutical organizations in Nigeria. Therefore, it is advised that the government and pharmaceutical companies create a policy to ensure quick disclosure of environmental accounting in their financial report since this would be crucial information that might affect the choices of stakeholders in the business environment. Also necessary is the establishment of a statutory reporting structure for environmental actions, which will give companies that choose not to comply with legal protection.

Empirically, it is possible to suggest the following in keeping with the goals of this study:

Corporate size has a favourable and substantial impact on pharmaceutical industries listed in Nigeria's environmental accounting disclosure. Therefore, the management of the organization should make sure that the firm's size is appropriately increased for continued effectiveness and profitability as well as a strong positive and significant impact on the environmental accounting disclosure of Nigerian listed pharmaceutical companies. Leverage has a detrimental and little impact on Nigerian pharmaceutical businesses' environmental accounting disclosure, so the management should provide an optimal level of performance to entice the provider of funds. As a result, all stakeholders must ensure compliance with necessary regulations to ensure the ongoing concern of the companies for future effective performance.

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