



CORPORATE FINANCIAL HETEROGENEITY AND ENVIRONMENTAL DISCLOSURE OF LISTED OIL AND GAS FIRMS IN NIGERIA

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ABSTRACT: *The study examined the effect of financial heterogeneity on the environmental disclosure of listed oil and gas firms in Nigeria. Specifically, the study ascertained the effect of total assets, total sales and financial leverage on waste management disclosure of listed oil and gas firms in Nigeria. Ex-post facto research design was used for the study and the population of the study comprised all the listed oil and gas firms on the Nigerian Exchange Group as of 31st Dec 2023. However, based on the use of the purposive sampling technique, six (6) listed oil and gas firms were chosen as the sample of the study based on the criteria of attainment of at least 10 consecutive years of listing on the Nigerian Exchange Group and on the availability of data. Secondary data were collected from the annual financial reports of the selected firms for the period 2012 to 2021 and Descriptive statistics was used to summarise the data collected. Panel regression analysis was used to analyse the data via E-Views statistical software, version 10. The result of the analysis revealed that while total assets have a significant and negative effect on waste management disclosure of listed Oil and Gas companies in Nigeria, total sales and financial leverage have a significant positive and non-significant positive effect respectively on waste management disclosure of listed Oil and Gas firms in Nigeria. Based on the findings, the study concluded and recommended amongst others that firms should consider leveraging their finances to support waste management initiatives as this can not only enhance their disclosure practices but also reduce their environmental footprint and improve their long-term financial performance.*

KEYWORDS: Firm Attributes, Disclosure, Environment, Environmental Disclosure.



INTRODUCTION

The importance of cash as an indicator of the continuing financial health of firms cannot be overemphasised because of its crucial role in business sustainability (Collett & Hraskey, 2015). Therefore, firms are required to maintain a balance between liquidity and profitability while conducting its day to day operations. Firms can be distinguished from one another on the basis of different financial and non-financial characteristics including size, age, value, profitability, structure, leverage, liquidity etc. These characteristics are unique to specific companies and raise a perception in the mind of the users of the information regarding the performance and future of a firm.

Traditionally, annual reports have served as a medium to inform stakeholders about the economic, social and environmental performance of a corporation. In the light of the growing magnitude of ecological patterns, corporate environmental disclosure has become an important avenue for firms to gain competitive advantage (Moruff, Ado, Salisu & Yunusa, 2021; Yadegaridehkordi, Foroughi, Iranmanesh, Nilashi & Ghobakhloo, 2023). With the shift in economic focus towards social/environmental longevity, firms are encouraged to look at the big picture and see their impact on the world around them as the fundamental philosophy propagated today is how imperative it is that firms address all values in reporting in order to lessen the chance that their activities will cause harm to global resources, not only for today's population but for future generations.

Despite the fact that industrialisation has led to increased environmental hazards, such as pollution, global warming, deforestation, and desertification, environmentally responsible companies, such as those in the oil and gas industry, are expected to not only implement eco-friendly practices but also report on them in their annual or sustainability reports (Ezekwesili & Ezejiofor, 2022). The purpose of disclosing such information is to demonstrate the company's commitment to promoting a green environment and to ensure that future generations can also benefit from the environment without compromising its ability to generate profits (Onyali & Okafor, 2018). This practice allows companies to benefit financially from the environment while also safeguarding it for future generations.

Research shows that the level of environmental performance exhibited by listed oil and gas companies in Nigeria is generally low, primarily due to the voluntary nature of environmental disclosure (Okafor, Egbunike & Amahalu, 2022). Furthermore, adopting environmentally friendly practices can be expensive for companies, which can deter them from integrating such models into their business operations. Typically, firms with low environmental performance indexes have limited resources, such as a smaller asset base, lower sales revenue, or sub-optimal leverage, which can make it challenging to cover the costs associated with environmental performance, such as waste management expenses.

As some oil and gas companies do not have the financial resources to pay adequate attention to environmental sustainability, some of the firms often neglect to consider environmental factors in their decision-making processes, which can lead to activities that contribute to environmental degradation, such as global warming and pollution (Asuquo, Dada & Onyeogaziri, 2018). Additionally, poor environmental performance can damage a company's corporate legitimacy, as it can erode the goodwill of environmental stakeholders who have an interest in the firm's activities.



Among the scholars who have conducted related research on the subject of this study are Bakti and Nengzih (2023), Fitriah and Harventy (2023), Yadegaridehkordi et al. (2023), and Ezekwesili and Ezejiolor (2022). However, this study focuses on ascertaining the effect of corporate financial attributes on the environmental disclosure of listed Oil and Gas firms in Nigeria.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Corporate Financial Heterogeneity

Corporate financial heterogeneity refers to the quantitative and qualitative features that determine a company's financial health and performance, including its liquidity, profitability, and solvency (Ezekwesili & Ezejiolor, 2022). They can also be called corporate financial characteristics since they refer to the financial metrics and ratios that reflect a company's financial position, such as its revenue growth, net income, earnings per share, and return on equity (Egolum, Amahalu & Obi, 2019). These attributes refer to the financial characteristics that define the health and performance of a company (Onyali & Okafor, 2018). Understanding these attributes is crucial for investors, financial analysts, and managers to evaluate the financial position of a company and make informed decisions.

Corporate financial characteristics are the financial qualities of a company (Moruff et al., 2021) that influence its ability to raise capital, invest in growth, and generate profits, such as its credit rating, debt levels, and cash flow. In other words, corporate financial characteristics encompass the financial strengths and weaknesses of a company, including its competitive position, market share, operating margins, and free cash flow (Shuaibu, 2020). The financial attributes of a corporate entity are the financial attributes that impact a company's valuation and stock price, such as its price-to-earnings ratio, price-to-sales ratio, and market capitalization (Ika, Rahayu, Elrifi & Widagdo, 2021). They are the financial indicators that reveal a company's financial stability and risk profile, such as its debt-to-equity ratio, interest coverage ratio, and credit default swap spreads.

Corporate financial attributes are the financial measures that determine a company's financial outlook and growth potential (Egolum, Amahalu & Obi, 2019), such as its capital expenditures, research and development spending, and new product launches. Additionally, investors and analysts also consider other financial attributes such as asset quality, market position, and management quality. Corporate financial attributes are essential to make informed investment and business decisions (Aris et al., 2021). These attributes provide investors and analysts with a holistic view of a company's financial position and performance. The liquidity, profitability, and solvency attributes are the three key attributes that investors and analysts focus on, and other attributes such as asset quality, market position, and management quality also play a critical role in determining a company's financial health and performance (Shuaibu, 2020).



Total Assets

Total assets refer to the complete value of all the resources a firm owns or controls that have economic value. These resources can include anything from tangible assets, such as real estate, equipment, and inventory, to intangible assets like patents, trademarks, and goodwill. Total assets are an important metric for assessing a company's financial health and stability, as they can be used to determine the company's ability to generate revenue, repay debts, and maintain operations over time (Wangsih et al., 2021).

Tangible assets are physical assets that can be seen, touched, and measured. These assets include real estate, vehicles, equipment, and inventory. Real estate represents the land and buildings that a company owns, which can be used for various purposes such as production, storage, and sales. Vehicles and equipment are used for production, delivery, or other company-related activities. Inventory represents the raw materials, work-in-progress goods, and finished products that a company has on hand. Intangible assets are assets that do not have physical substance and cannot be touched or seen. These assets include patents, trademarks, copyrights, and goodwill. Patents are legal rights that protect a company's inventions, while trademarks and copyrights protect a company's brands and creative works. Goodwill is the value of a company's reputation and customer relationships, which can be difficult to measure but can contribute significantly to a company's overall value.

Total assets are typically used in conjunction with total liabilities to calculate a company's equity, or the value of a company's assets that are not subject to repayment of debts (Wangsih, Yanti, Yohana, Kalbuana & Cahyadi, 2021). If a company has more assets than liabilities, it will have positive equity; if it has more liabilities than assets, it will have negative equity. Equity is an important metric for assessing a company's financial health and stability because it can be used to determine the company's ability to generate future earnings and grow over time.

Total assets are reported on a company's statement of financial position, which is one of the three main financial statements along with the income statement and the cash flow statement. The statement of financial position shows a company's financial position at a specific point in time, listing its assets, liabilities, and equity. Investors and analysts use the statement of financial position to assess a company's financial health and make decisions about investing in the company. Different industries have different types of assets, and the size of a company can also affect the types and amounts of assets it has (Abdulsalam & Auwal, 2020). For example, a manufacturing company may have a significant amount of tangible assets such as machinery, while a technology company may have more intangible assets such as patents and intellectual property. Additionally, larger companies may have a more diverse range of assets, while smaller companies may have more limited assets (Gaur & Kesavan, 2015).

Total Sales

Total sales refer to the complete revenue generated by a company from the sale of goods or services during a given period of time, typically a fiscal quarter or year (Abdulsalam & Auwal, 2020). Total sales are an important metric for assessing a company's financial performance and are used to calculate other financial ratios such as gross margin, net income, and return on investment (Wangsih, Yanti, Yohana, Kalbuana & Cahyadi, 2021). A company can generate sales from a variety of sources, such as selling products directly to customers, selling products



to other businesses, or providing services to clients. For example, a retail store generates sales by selling products directly to customers, while a manufacturer generates sales by selling products to wholesalers or retailers. A service-based company generates sales by providing services to clients and charging fees for those services.

Total sales are calculated by multiplying the number of products sold by the price of each product, or by multiplying the number of services provided by the fee charged for each service. For example, if a company sells 100 products at ₦10 each, its total sales for that period would be ₦1,000. Similarly, if a company provides 50 hours of services at ₦50 per hour, its total sales for that period would be ₦2,500. Total sales are reported on a company's income statement, which is one of the three main financial statements along with the balance sheet and the cash flow statement. The income statement shows a company's revenue and expenses during a given period of time, typically a fiscal quarter or year. Investors and analysts use the income statement to assess a company's financial performance and to make decisions about investing in the company.

Different industries have different levels of demand and competition, which can affect a company's sales (Abdulsalam & Auwal, 2020). For example, a company in the consumer electronics industry may experience significant fluctuations in sales due to changes in consumer preferences and the release of new products by competitors. Similarly, larger companies may have more resources and marketing power to generate higher sales, while smaller companies may have more limited sales due to a smaller customer base or limited marketing efforts (Gaur & Kesavan, 2015).

Financial Leverage

Financial leverage is a term used to describe the extent to which a firm uses debt to finance its operations and investments (Iqbal et al., 2022). It refers to the use of borrowed funds to increase the return on investment, but it also increases the financial risk of the company. Financial leverage can be calculated using a variety of financial ratios, such as the debt-to-equity ratio, the interest coverage ratio, and the debt-to-assets ratio (Ehiedu, Onuorah & Mbagwu, 2022). Companies can use various types of debt, including long-term and short-term loans, bonds, and lines of credit, to finance their operations and investments. By borrowing money, companies can increase their financial leverage and potentially increase their return on investment. However, they also assume greater financial risk, as they are required to make interest payments and repay the principal amount of the debt (Sarwar, Al-Faryan & Saeed, 2022).

The advantage of using financial leverage is that it allows a company to generate a higher return on investment than it would by using its own funds. This is because the cost of borrowing is typically lower than the return on investment generated by the borrowed funds (Ehiedu, Onuorah & Mbagwu, 2022). However, the disadvantage of using financial leverage is that it increases the financial risk of the company. If the company is unable to generate enough income to make interest payments or repay the principal amount of the debt, it may face financial difficulties or even bankruptcy.

One common financial ratio used to calculate financial leverage is the debt-to-asset ratio, which compares the amount of debt a company has to its total assets. A high debt-to-asset ratio indicates that a company is using a significant amount of debt to finance its operations, which may increase its financial risk (Iqbal et al., 2022). Another financial ratio used to calculate



financial leverage is the interest coverage ratio, which compares a company's earnings before interest and taxes (EBIT) to its interest payments. A high-interest coverage ratio indicates that a company is able to generate enough income to cover its interest payments.

Different industries have different levels of debt usage, depending on the nature of their operations and the availability of financing. For example, industries with high capital expenditures, such as manufacturing or construction, may require more debt to finance their operations than industries with lower capital expenditures, such as software development. Additionally, the financial leverage of a company can vary depending on its size, profitability, and growth prospects.

Financial leverage is an important consideration for investors, as it can affect a company's profitability and financial risk (Wangsih et al., 2021). Investors may use financial ratios such as the debt-to-equity ratio and interest coverage ratio to assess a company's financial leverage and to make decisions about investing in the company. Similarly, lenders may use financial ratios to evaluate a company's creditworthiness and to determine the terms of a loan. Understanding a company's financial leverage is an important aspect of financial analysis and decision-making. Financial leverage is a measure of a company's ability to meet its long-term financial obligations (Yimam, Tsegba & Duenya, 2023). It can also be called solvency which is essential as it ensures that a company can continue to operate and grow in the long run. The debt-to-equity ratio and debt-to-asset ratio are commonly used metrics to evaluate a company's solvency position.

Environmental Disclosure

Environmental disclosure can be defined as an organization's environmental reporting practices (Fitriah & Harventy, 2023). This includes the disclosure of information about an organization's environmental impact and performance to stakeholders, such as investors, customers, and regulators. Environmental disclosure includes those practices of reporting information about the environmental policies, strategies, goals, risks and performance metrics related to environmental sustainability. This reporting practice encompasses various aspects of environmental disclosure including environmental risk disclosure, gas emission disclosure, environmental management disclosure and greenhouse disclosure.

In recent years, the concept of environmental disclosure has gained significant attention as concerns about the environmental impact of human activities have grown. There are several aspects of environmental disclosure and the most appropriate approach will depend on the specific context. One of the most common aspects is environmental compliance, which refers to an organization's compliance with environmental regulations and standards (Moruff et al., 2021). Another approach is through the use of environmental management systems, which organizations can use to manage their environmental impact. These systems can include processes for identifying and managing environmental risks, setting environmental targets and objectives, and monitoring and reporting on environmental performance.



Waste Management Disclosure

Waste management disclosure refers to the reporting of information related to a company's management of waste, including the generation, handling, treatment, and disposal of waste materials (Adler, Mansi & Pandey, 2022). Such disclosure may be made in a company's financial statements or other reports, such as sustainability or environmental reports (Ezekwesili & Ezejiofor, 2022). The disclosure is intended to provide stakeholders with information about the company's environmental impact, as well as, its efforts to manage waste in an environmentally responsible manner (Fabian & Emeka, 2022). Waste can include solid waste, hazardous waste, and wastewater, as well as emissions to the air and water. The management of waste can include activities such as waste reduction and recycling, as well as disposal through landfilling, incineration, or other methods. Waste management is an important aspect of environmental management, as it can have significant impacts on air and water quality, as well as on the health and safety of employees and the public (Gull, Atif & Hussain, 2023).

One reason is that waste management can have a significant environmental impact, including air and water pollution, greenhouse gas emissions, and habitat destruction (Adler, Mansi & Pandey, 2022). By disclosing information about their waste management practices, companies can demonstrate their commitment to environmental responsibility and help stakeholders understand the potential environmental risks associated with their operations. Additionally, waste management disclosure can be an important factor in investment decisions, as investors increasingly consider environmental, social, and governance (ESG) factors when evaluating potential investments.

In many jurisdictions, companies are required to report on their waste management practices as part of their environmental compliance obligations. Effective disclosure should provide clear, concise, and accurate information about a company's waste management practices, including the types and quantities of waste generated, the methods used for handling and disposal, and the company's efforts to reduce waste and improve environmental performance (Gull, Atif & Hussain, 2023). It should also provide information about any environmental risks associated with waste management, as well as the company's efforts to mitigate these risks (Adler, Mansi & Pandey, 2022). Finally, effective disclosure should be transparent and accessible, allowing stakeholders to easily access and understand the information provided.

Many firms include waste management disclosure in their sustainability or environmental reports, which provide a more comprehensive view of the company's environmental impact and sustainability practices (Fabian & Emeka, 2022). These reports often include information on other aspects of environmental management, such as energy use, water use, and greenhouse gas emissions, and may also include information on social and governance issues (Salesa, Leon & Moneva, 2023). By providing a more comprehensive view of the company's sustainability practices, these reports can help stakeholders better understand the company's overall approach to sustainability and environmental responsibility (Ezekwesili & Ezejiofor, 2022).



Effect of Corporate Financial Attributes on Environmental Disclosure

The financial attributes of a corporation, such as total sales, total assets, and financial leverage, can have a significant impact on its environmental disclosure, particularly as it concerns waste management disclosure. Firms with higher sales tend to have more resources to invest in environmentally sustainable practices and technologies (Abdulsalam & Auwal, 2020). This can lead to more efficient waste management systems and greater transparency in reporting waste disposal practices, ultimately resulting in a higher waste management disclosure score.

Furthermore, firms with larger asset bases have more long-term investment potential and are more likely to make significant investments in environmental sustainability initiatives, including waste management. These investments can result in better waste management disclosure scores, as the company is more likely to report on and disclose its environmental practices (Moruff et al., 2021).

Also, firms that employ leverage or debt financing have a higher risk of default and bankruptcy. As such, these firms may be more motivated to implement environmentally sustainable practices and disclose their waste management strategies to avoid negative consequences. This, in turn, can lead to higher waste management disclosure scores.

Moreover, regulatory pressure to disclose environmental performance in Nigeria has increased in recent years, particularly in industries such as the oil and gas industries with high environmental impact (Egolum, Amahalu & Obi, 2019). This pressure has resulted in corporations being more likely to invest in sustainable practices and report on their environmental initiatives, leading to higher waste management disclosure scores. Finally, consumers and investors are increasingly demanding greater transparency and accountability from firms regarding their environmental performance, including waste management practices (Moruff et al., 2021). Companies that prioritize environmental sustainability and disclose their waste management practices may benefit from improved consumer and investor trust, loyalty, and ultimately, financial performance (Ika et al., 2021). A corporation's financial attributes, including total sales, total assets, and financial leverage, can have a significant impact on its environmental performance and waste management disclosure. As such, firms that prioritize sustainability and invest in environmentally sustainable practices are likely to see benefits not only in their environmental impact but also in their financial performance and reputation (Okpanachi et al., 2017).

Based on the above, the following were hypothesised for this study:

HO1: Total assets do not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.

HO2: Total sales do not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.

HO3: Financial leverage does not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.



Theoretical framework

This study is anchored on the Stakeholders theory. This theory is a management and ethical theory that posits that corporations have a responsibility to consider the needs and interests of all stakeholders, not just shareholders (Meutia, Kartasari & Yaacob, 2022). The theory originated in the 1960s and 1970s as a response to the growing concern over the impact of corporate activities on society and the environment. The theory was first proposed by R. Edward Freeman in his book "Strategic Management: A Stakeholder Approach," in which he argued that businesses should operate in a way that benefits all stakeholders, including employees, customers, suppliers, the community, and the environment (Dameri & Ferrando, 2022). This is in contrast to the traditional view that corporations exist solely to maximize shareholder value.

Stakeholders theory suggests that corporations have a responsibility to mitigate their negative impact on the environment and take an active role in promoting environmental sustainability (Suileek & Alshurafat, 2022). This is because the environment is a stakeholder in its own right, with a significant impact on the health and well-being of other stakeholders. From a stakeholder perspective, corporations that prioritize sustainable practices and disclose their waste management strategies are more likely to meet the expectations of their various stakeholders. For example, customers are increasingly concerned about the environmental impact of the products and services they consume and may prefer to support companies that prioritise sustainability (Suileek & Alshurafat, 2022).

Similarly, employees may be more engaged and loyal to companies that prioritise environmental sustainability, resulting in lower turnover and greater productivity. Moreover, companies that prioritize sustainability may be better able to maintain positive relationships with local communities and regulators, as they are less likely to have negative environmental impacts that can harm these stakeholders (Dameri & Ferrando, 2022). This can lead to greater social license to operate and reduce the risk of legal or reputational challenges.

Therefore, from an environmental perspective, corporations have a responsibility to mitigate their negative impacts on the environment, including those related to waste management. Companies that invest in sustainable practices and report on their waste management strategies are more likely to meet this responsibility, which can result in a positive environmental impact and improved environmental performance (Gallego-Álvarez & Pucheta-Martínez, 2022). Stakeholders theory is a useful framework for understanding the relationship between a corporation's financial attributes and its environmental performance, particularly in the context of waste management disclosure. This theory asserts that corporations have a responsibility to not only maximise shareholder value but also consider the needs and interests of all stakeholders, including customers, employees, suppliers, communities, and the environment (Boshnak, 2022).



Empirical framework

Yadegaridehkordi et al. (2023) examined the determinants of firm environmental performance of Small and Medium-sized Enterprises (SMEs). Results showed that green entrepreneurial orientation, green innovation, leadership commitment, and market orientation positively and significantly influenced environmental performance.

Fitriah and Harventy (2023) examined the influence of company characteristics and Environmental Performance on the disclosure of Islamic Social Reporting (ISR). The results showed that Company Characteristics as measured by the age of the company had a significant effect while Type of Industry had no significant effect and Environmental Performance had a significant effect.

In a study conducted by Ezekwesili and Ezejiofor (2022), the impact of firm characteristics on the environmental performance of quoted conglomerates firms in Nigeria was investigated. Findings indicated that the waste management expenditure of quoted conglomerate firms in Nigeria was not significantly influenced by firm size and firm leverage.

Moruff et al. (2021) examined the effect of firm attributes on environmental sustainability among firms in Nigeria. The result of the Generalized Least Square (GLS) showed that leverage positively affects environmental sustainability but firm age does not.

Ika, Rahayu, Elrifi and Widagdo (2021) determined the effect of firm attributes on the environmental reporting of manufacturing companies in Indonesia. The result of the multivariate regression analysis showed that firm attributes positively affect environmental sustainability reporting.

Onyali and Uchegbu (2021) ascertained the determinants of the environmental performance of Oil and Gas firms listed on the Nigerian Exchange Group. The result of the Ordinary Least Square regression indicated that firm size, firm profitability, firm leverage and firm liquidity significantly influenced annual waste management expenditure of listed oil and gas firms in Nigeria.

Shuaibu (2020) conducted a study that investigated how firm characteristics influence the quality of environmental disclosure among listed cement companies in Nigeria. The findings from the study indicated that firm age, firm size, and leverage all had a significant impact on the quality of environmental disclosure.

Abdulsalam and Auwal (2020) conducted an empirical study to examine the influence of sales and firm size on sustainability reporting among oil and gas companies in Nigeria. According to the findings, the characteristics of firms represented by sales growth and leverage had a negative impact on sustainability reporting, whereas firm size had a positive and significant effect on both sustainability reporting and profitability of oil and gas companies operating in Nigeria.



METHODOLOGY

The research design adopted for this study was *ex-post facto* research. The design was considered suitable for this study because it is used to analyze the relationship between two variables after their events have occurred. Thus, the design was used to observe and analyze the relationship between corporate financial attributes and environmental disclosure in the Oil and Gas sector in Nigeria. The Population of the study was made up of 10 listed Oil and Gas firms in Nigeria as of 31st December 2023. However, the Purposive sampling technique was used to select the sample participants. The selection of a purposive sampling technique allows the researcher to choose a sample that is most appropriate for the study and meet the required criteria. Hence, Six (6) firms out of the 10 listed Oil and Gas firms in Nigeria were selected. The firms were selected based on their availability of data and on the attainment of at least 10 consecutive years of listing on the Nigerian Exchange Group.

Secondary data were collected from the annual financial reports of the selected firms for the period 2012 to 2021 and Descriptive statistics was used to summarise the data collected. Panel regression analysis was used to analyse the data via E-Views version 10. Statistical tests in this study were carried out at an alpha level of 5%. As a decision rule, if the *p-value* is greater than 5% ($P\text{-value} \geq 0.05$), the null hypothesis is accepted and vice versa.

Model specification

The regression model used in the analysis is a panel multiple regression model that aims to determine the relationship between the independent variables (total assets, total sales, and financial leverage) and the dependent variable (waste management disclosure). The regression model is represented as follows, with Firm Age as a control variable:

$$\text{WMD}_{it} = \beta_0 + \beta_1 \text{TA}_{it} + \beta_2 \text{TS}_{it} + \beta_3 \text{FL}_{it} + \beta_4 \text{FA}_{it} + \varepsilon_{it}$$

Where: WMD = Waste Management Disclosure

TA = Total Assets

TS = Total Sales

FL = Financial Leverage

FA = Firm Age

ε = Error term

it = firm i in year t

β_0 = Constant

$\beta_1\text{-}3$ = parameter estimates

**Table 1: Variable Description and Measurements**

Variable	Measurement
Waste Management Disclosure	Environmental Performance Evaluation Matrix developed by Van Zyl (2013)
Total Assets	Natural Log of Total Assets
Total Sales	Natural Log of Total Revenues
Financial Leverage	Total Liabilities/Total Assets
Firm Age	The number of years the firm has been in existence

Source: Researcher's Compilation (2024)

In line with Van Zyl's (2013) themes of the Environmental Performance Evaluation Matrix, Waste Management Disclosure was measured using three themes: Accounting for waste, Measuring of waste, and Setting measurable targets for waste reduction. These three themes are summated to produce the index for Waste Management Disclosure. The score sheet for Waste Management Disclosure was mapped out as follows:

Table 2: Score Sheet for Measuring Waste Management Disclosure

Variable	Score
Accounting for waste (AFW)	"1" if accounted, "0" if not
Measuring of waste (MOW)	"1" if measured, "0" if not
Setting of measurable targets for waste reduction (SMT)	"1" if set, "0" if not
Total Waste Management Disclosure	Summated Score Obtained/3

Source: Researcher's Compilation (2024)

DATA ANALYSIS AND DISCUSSION OF RESULTS

Various statistical techniques were utilised in the analysis of the data of this study. These include descriptive statistics and panel multiple regression analysis.

Table 3: Presentation of Descriptive Statistics

	WMD	TA	TS	FL	FA
Mean	0.194444	7.732809	7.755274	0.765634	40.66667
Median	0.000000	7.773438	8.034199	0.736132	45.50000
Maximum	0.666667	8.319583	8.533157	2.222321	57.00000
Minimum	0.000000	7.233574	4.933755	0.466088	18.00000
Std. Dev.	0.223747	0.238328	0.888706	0.274857	11.79150
Skewness	0.710358	-0.066157	-2.020348	3.733042	-0.603048
Kurtosis	2.415513	2.785729	5.946941	18.58960	1.809774
Jarque-Bera	5.900154	0.158548	62.52924	746.9452	7.178262
Probability	0.052336	0.923787	0.000000	0.000000	0.027622
Sum	11.66667	463.9685	465.3165	45.93804	2440.000
Sum Sq. Dev.	2.953704	3.351203	46.59806	4.457226	8203.333
Observations	60	60	60	60	60

Source: Analysis Output from Eviews Version 10



Table 3 provides descriptive statistics for the variables used in the study:

WMD: Waste management disclosure of listed Oil and Gas companies in Nigeria. The mean value is 0.194444, with a minimum of 0 and a maximum of 0.666667. The standard deviation is 0.223747, indicating a moderate level of variability in the data. The variable is positively skewed, with a skewness value of 0.710358, suggesting that most of the companies have low levels of waste management disclosure. For the WMD variable, the Jarque-Bera value is 5.900154 with a probability of 0.052336 shows that the data are normally distributed.

Log(TA): Logarithm of total assets of the companies. The mean value is 7.732809, with a minimum of 7.233574 and a maximum of 8.319583. The standard deviation is 0.238328, indicating a moderate level of variability in the data. The variable is negatively skewed, with a skewness value of -0.066157, suggesting that most of the companies have relatively high total assets. For the Log(TA) variable, the Jarque-Bera value is 0.158548 with a probability of 0.923787 which shows that the data follow a normal distribution.

Log(TS): Logarithm of total sales of the companies. The mean value is 7.755274, with a minimum of 4.933755 and a maximum of 8.533157. The standard deviation is 0.888706, indicating a high level of variability in the data. The variable is highly negatively skewed, with a skewness value of -2.020348, suggesting that most of the companies have relatively low total sales. For the Log(TS) variable, the Jarque-Bera value is 62.52924 with a probability of 0.000000, indicating that the data for this variable is not normally distributed.

FL: Financial leverage of the companies. The mean value is 0.765634, with a minimum of 0.466088 and a maximum of 2.222321. The standard deviation is 0.274857, indicating a moderate level of variability in the data. The variable is highly positively skewed, with a skewness value of 3.733042, suggesting that most of the companies have relatively low financial leverage. For the FL variable, the Jarque-Bera value is 746.9452 with a probability of 0.000000, indicating that the data for this variable is also not normally distributed.

FA: Firm age of the companies. The mean value is 40.66667, with a minimum of 18 and a maximum of 57. The standard deviation is 11.79150, indicating a high level of variability in the data. The variable is negatively skewed, with a skewness value of -0.603048, suggesting that most of the companies are relatively old. For the FA variable, the Jarque-Bera value is 7.178262 with a probability of 0.027622, indicating that the data for this variable is not normally distributed.



RESULTS AND DISCUSSIONS

Test of Hypotheses

Panel least square regression analysis was used to determine the effect of total assets, total sales, and financial leverage on waste management disclosure of the listed Oil and Gas companies in Nigeria. The estimated model is re-stated below.

$$WMD_{it} = \beta_0 + \beta_1 TA_{it} + \beta_2 TS_{it} + \beta_3 FL_{it} + \beta_4 FG_{it} + \epsilon_{it}$$

Table 4: Panel Least Square Regression

Dependent Variable: WMD

Method: Panel Least Squares

Date: 04/15/24 Time: 00:16

Sample: 2012 – 2021

Periods included: 10

Cross-sections included: 6

Total panel (balanced) observations: 60

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TA	-0.374125	0.165844	-2.255882	0.0281
TS	0.195548	0.042850	4.563581	0.0000
FL	0.012245	0.104866	0.116768	0.9075
FA	-0.004889	0.003152	-1.551229	0.1266
C	1.760416	1.080426	1.629371	0.1089
R-squared	0.324814	Mean dependent var		0.194444
Adjusted R-squared	0.275710	S.D. dependent var		0.223747
S.E. of regression	0.190421	Akaike info criterion		-0.399508
Sum squared resid	1.994299	Schwarz criterion		-0.224979
Log-likelihood	16.98525	Hannan-Quinn criter.		-0.331240
F-statistic	6.614762	Durbin-Watson stat		1.193390
Prob(F-statistic)	0.000202			

Source: Analysis Output from Eviews Version 10

Table 4 shows the results of the regression analysis examining the effect of three corporate financial attributes (total assets, total sales, and financial leverage) alongside the control variable (firm age) on waste management disclosure of listed oil and gas companies in Nigeria. The R-squared value of 0.324814 indicates that the model explains about 32.5% of the variation in waste management disclosure, which is moderate. The adjusted R-squared value of 0.275710 takes into account the number of independent variables in the model and is slightly lower than



the R-squared value. The F-statistic of 6.614762 is statistically significant at a probability level of 0.000202, indicating that the regression model as a whole is a good fit for the data.

The results suggest that total sales have a positive effect on waste management disclosure, while total assets have a negative effect, and financial leverage and firm age have no significant effect. Firm age (FA) has a negative coefficient of -0.004889, which means that as the age of the company increases, waste management disclosure decreases. However, this coefficient is not statistically significant at a probability level of 0.1266.

Test of Hypothesis I

HO1: Total assets do not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.

From Table 4, total assets (TA) have a negative coefficient of -0.374125, which means that as the total assets of the company increase, waste management disclosure decreases. This coefficient is statistically significant since the probability level of 0.0281 is less than 0.05. Therefore, in rejection of the null hypothesis, the researchers conclude that total assets have a significant and negative effect on the waste management disclosure of listed Oil and Gas companies in Nigeria (p -value = 0.0281).

Test of Hypothesis II

HO2: Total sales do not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.

Total sales (TS) have a positive coefficient of 0.195548, indicating that as the total sales of the company increase, waste management disclosure also increases. This coefficient is statistically significant since the probability level of 0.0000 is less than 0.05. Therefore, in rejection of the null hypothesis, the researchers conclude that total sales have a significant and positive effect on waste management disclosure of listed Oil and Gas companies in Nigeria (p -value = 0.000).

Test of Hypothesis III

HO3: Financial leverage does not have a significant effect on waste management disclosure of listed Oil and Gas companies in Nigeria.

Financial leverage (FL) has a positive coefficient of 0.012245, indicating that as financial leverage increases, disclosure of waste management also increases. However, there is no significant relationship between financial leverage and waste management disclosure since the probability level of 0.9075 is greater than 0.05. Therefore, in acceptance of the null hypothesis, the researchers conclude that financial leverage has a non-significant positive effect on waste management disclosure of listed Oil and Gas companies in Nigeria (p -value = 0.9075).



DISCUSSION OF FINDINGS

The findings suggest that the relationship between certain corporate financial attributes and waste management disclosure of listed Oil and Gas companies in Nigeria is not straightforward. Firstly, the negative effect of total assets on waste management disclosure is surprising. Typically, larger companies tend to have more resources to invest in environmental sustainability practices and are more likely to disclose their efforts to stakeholders (Abdulsalam & Auwal, 2020). However, this finding suggests that in the context of Nigeria's Oil and Gas sector, larger companies may have more complex operations that make waste management disclosure more challenging. Additionally, these companies may have more at stake in terms of reputation and public perception, leading them to be more cautious in their disclosures. This finding agrees with the results found by Okafor, Egbunike, and Amahalu (2022) but contradicts the results of Egolum, Amahalu, and Obi (2019) and Onyali and Okafor (2018).

Secondly, the positive effect of total sales on waste management disclosure aligns with expectations. Companies with higher sales revenues are often under greater scrutiny from stakeholders and regulators, which could motivate them to prioritise waste management practices and disclosure. This finding of a positive and significant effect corroborates the results found by Onyali and Uchegbu (2021) and Egolum, Amahalu, and Obi (2019).

Lastly, the positive effect of financial leverage on waste management disclosure is also intriguing. One possible explanation is that companies with higher levels of financial leverage may face greater pressure from lenders or investors to demonstrate responsible environmental practices. Alternatively, companies with more debt may see environmental sustainability efforts as a way to mitigate financial risks and protect their reputation. However, the study found that the positive effect of financial leverage on environmental disclosure is not significant just as was found by Ezekwesili and Ezejiofor (2022) and Yousra (2017). Shuaibu (2020) realised a significant positive effect.

CONCLUSION AND RECOMMENDATIONS

A corporation's financial attributes, including financial leverage, total assets, and total sales, can influence its environmental performance, specifically in the context of disclosing waste management practices. Theoretically, it is commonly believed that financial stability and environmental disclosure, as measured by waste management disclosure, may have a positive correlation. Companies with larger sales revenues typically have more resources to allocate towards environmentally-friendly practices and technologies, which can result in better waste management systems and more transparent reporting of waste disposal methods. However, the finding of the study suggested that firm total assets are negatively associated with waste management disclosure, indicating that larger companies may be less transparent about their waste management practices.

On the other hand, total sales have a positive effect on waste management disclosure, suggesting that companies with higher revenues may be more willing to disclose their waste management practices. Additionally, the study found that financial leverage has a positive although non-significant effect on waste management disclosure, indicating that companies with higher levels of debt may be more incentivized to disclose their waste management practices to investors and stakeholders. The above findings show that corporate financial



attributes play an important role in shaping the environmental performance of Oil and Gas companies in Nigeria, and highlight the importance of transparency and disclosure in promoting sustainable business practices in the industry.

Based on the findings of the study, the following recommendations were made:

1. Although the study found that total assets have a negative effect on waste management disclosure, it is important for companies to recognize the importance of waste management and make more commitments towards waste management disclosure regardless of their size or asset base. This is because a strong commitment to transparency and sustainability can help the firms build trust with stakeholders and enhance their reputation.
2. Firms should focus on increasing sales to improve waste management disclosure: The study suggests that total sales have a positive effect on waste management disclosure. Therefore, companies should aim to increase their sales and revenue, as this can help them invest more in waste management initiatives and promote transparency around their efforts.
3. Firms should consider leveraging their finances to support waste management initiatives. This suggests that companies should consider using debt to finance waste management initiatives and other sustainability efforts. By doing so, they can not only enhance their disclosure practices but also reduce their environmental footprint and improve their long-term financial performance.

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