IMPACT OF FIRM CHARACTERISTICS ON ENVIRONMENTAL PERFORMANCE OF LISTED CONSUMER GOODS FIRMS IN NIGERIA

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Abstract
This study examines the impact of firm characteristic on environmental performance of listed consumer goods firms in Nigeria. The study uses sixteen out of twenty listed consumer goods firms in Nigeria, and adopts correlational research design. Data for the study was extracted from the annual reports and accounts of the sampled firms for a period of 13 years from 2010 to 2022, and analyzed using multiple regressions. The results from the statistical analysis reveal a significant impact of firm characteristics (leverage, tangibility and firm size) on environmental performance using waste management cost while profitability, firm age and liquidity have insignificant impact on environmental performance of the sampled companies. The study concludes that leverage, tangibility and firm size affect environmental performance of the listed consumers' goods companies in Nigeria. Based on this, this study recommends that management of listed consumer goods companies in Nigeria should take into account factors such as leverage, tangibility and firm size when deciding on to spend on waste management for environmental performance. Also, the management should embrace environmental performance practice in their plan which may elevate a company's image, engender trust, and secure its place as a frontrunner in the race towards a sustainable and profitable future. This implies that companies in line with their attributes should develop business models and strategies that will ensure environmental sustainability practice.

Keyword: Firm characteristics, environmental performance, consumer goods firms in Nigeria.

Introduction

In a recent year, the Nigerian government has taken steps to promote environmental sustainability practices through policies and regulations such as the National Policy on Environment, the National Environmental Standards and Regulations Enforcement Agency (NESREA), and the Nigerian Climate Change Response Strategy and Action Plan (NCCRSAP). The Nigerian government's policies and regulations play a crucial role in promoting environmental sustainability practices in the country. Economic development efforts have resulted into environmental activities such as growing pollution, global warming, deforestation and desertification (Onyali & Okafor, 2018). There is also a growing social awareness that increases the pressure on firms regarding their responsibility to the environments in the conduct of businesses. Consequently, many firms take as much responsibility for environmental protection as they do for economic issues and a major reason for this is that firms are reflecting

growing environmental protection expectations from various stakeholders (Chukwuebuka & Okonkwo, 2020).

Responsibility is reflected in reports made by these firms through their annual reports on a regular basis concerning environmental issues. Gray (2005) opines that environmental accounting has become necessary, because the traditional accounting system which handles most environmental costs as overhead costs is insufficient in providing managers with proper information for strategic decision making. This is because under the traditional accounting approach, a business success is judged by the volume of profit it makes and the market value of its shares while significant environmental issues are neglected. Despite the clear benefits of environmental accounting, the decision whether a firm engages in environmental reporting or not can be influenced by a lot of factors as documented in the literature (Orajekwe & Ogbodo, 2023; Younis & Sundarakani, 2020; Oranefo, 2022 and Egolum et al., 2019). Firm characteristics such as firm size, leverage, profitability of the firm, age of firm amongst others influence firms' environmental performance.

Firm attributes, also known as firm characteristics, encompass the distinct qualities and identities that set an organization apart from its competitors (Okenwa & Ogbodo, 2023). These attributes serve as crucial parameters for understanding and characterizing a company, leading to diverse conceptualizations in research studies. According to previous studies such as Okenwa and Ogbodo (2023), Ghosh et al. (2023) and Chukwuebuka and Okonkwo (2020) opine that one factor affecting the quality of environmental performance is firm characteristics. Profitability is the measurement of excess revenue over expenses incurred (Akhter et al., 2022). It is the ultimate output of a company and this can affect the environmental performance. Leverage is the use of assets and sources of funds by companies that have fixed costs (fixed costs) with a view to increasing shareholder profits (Okenwa & Ogbodo, 2023). Companies that use leverage with the aim that the benefits obtained are greater than fixed costs and this may affect environmental performance practice. The size of the company describes the size of a company that can be seen from the total assets, total sales, average total sales and average total assets which may affect environmental performance. Firm age refers to the number of years since when the firm was established and started operation in the business market. Firm age is an important determinant of environmental performance.

The relationship between the firm characteristics and their environmental performance is a subject of interest to many researchers. Factors such as profitability, leverage, tangibility, firm size, industry, age, liquidity and ownership structure have been shown to have an impact on environmental performance (Akhter et al., 2022; Oranefo, 2022; and Rini & Adhariani, 2020). Nigeria, being a developing country with a growing economy, has seen an increase in environmental concerns, and research on this topic is becoming more prevalent. Several potential firm characteristics have been identified in the literature for firms' varying attitude towards environmental performance.

Orajekwe et al. (2023) focused on structural aspects of firm characteristics, namely firm size, age, and leverage, suggested that larger and older firms seem to grapple with revealing their environmental practices, possibly due to their intricate operations and established reporting practices. Gachoka et al. (2018) associate firm characteristics with organizational resources and organizational goals, recognizing that the structural, market and capital-related aspects of a corporation can be evaluated to ascertain its strengths and objectives. According to Gachoka et al. (2018), structural characteristics, including age, profitability, leverage, ownership, and size, offer valuable insights into a company's position within its industry. Capital-related variables,

such as liquidity, tangibility and capital intensity, shed light on the financial foundation of a firm (Gachoka et al., 2018). Market-related variables, like industry type and environmental uncertainty, provide further context for understanding a company's strategic positioning and adaptability (Gachoka et al., 2018). Likewise, Wuttichindanon (2017), suggest that larger companies tend to receive more attention from the public and, therefore, they are under greater public pressure to exhibit environmental responsibility and sustained environmental performance.

Recognizing the significance of this paradigm shift, scholars have directed their attention to studying the intricate relationship between environmental issues and business practices both in developed and developing countries. While substantial research has centred on the consequences of environmental management activities, such as financial performance, leverage, liquidity, size of firm and age, the findings have yielded inconsistent and ambiguous results (Orajekwe et al., 2023; Onyali & Okafor, 2018; Wuttichindanon, 2017) Consequently, comprehending the antecedents that drive corporations to engage in environmental responsibility activities remains a critical puzzle and considering the inconclusive findings of prior related research and the need for this study in Nigerian context.

In Nigeria, the study conducted by Orajekwe and Ogbodo (2023), Younis and Sundarakani (2020), Oranefo (2022), Egolum et al. (2019), Onyali and Okafor (2018) and Bassey et al. (2013) in examining the relationship between firm characteristics and environmental performance practices using different sectors. There are limitations on the findings and it is one of the gaps the study intends to fill. Similarly, there is a limitation in scope of the study and this presents a gap in period that this study also intends to fill. In the same vein, considering the uncertain findings of prior related research and the need for this study in Nigerian context. To address these pressing concerns, this study endeavors to shed light on the impact of firm characteristics on environmental performance among consumer goods companies listed on the Nigerian Exchange Group. By investigating potential firm characteristics that influence attitudes towards environmental performance, such as profitability, leverage, tangibility, firm size, age, and liquidity, its aim to offer crucial insights into the factors driving variations in environmental responsibility performance within the Nigerian context. Ultimately, this study aspires to strengthen the foundation for a greener and more responsible business landscape, both in Nigeria and beyond.

Literature Review

The operational meanings of various concepts are explained in this study below.

Concept of Environmental Performance

Environmental performance is the firm's performance in creating a green environment (Zandi et al., 2019). Environmental performance refers to the extent to which a firm or organization meets environmental standards, regulations, and expectations while conducting business activities while Antara et al. (2020) opted that environmental performance is related to how well the company manages the environmental aspects of activities, products, services and their impact on the environment. In Nigeria, environmental performance has become an essential issue for firms, as the country is grappling with a range of environmental challenges such as air and water pollution, climate change, and deforestation. Based on the environmental perspective, the realization of environmental goals stipulates managing environmental issues and integrating suitable strategies. Companies must develop strategies to achieve goals by integrating Environmental Performance (EP) aspects and including financial performance. Sustainable development strategies of companies comprise strategies that primarily protect the environment

and emphasize competitive advantage (Alnaim et al., 2023). Environmental performance is an essential concept for firms in Nigeria, given the country's environmental challenges and the increasing importance of environmental sustainability practices.

Concept of Firm Characteristics

Firm characteristics, also known as firm attributes, encompass the distinct qualities and identities that set an organization apart from its competitors. These characteristics serve as crucial parameters for understanding and characterizing a company, leading to diverse conceptualizations in research studies. Also, Firm characteristics are conceptualized differently by various studies depending on the criteria used to define it. However, most studies seem to agree with the position that firm characteristics are related with firm resources and organizational objectives (Mgeni & Nayak, 2016). Firm resources and objectives can be analyzed using three criteria namely; structure, market and capital related firm characteristics (Gachoka et al., 2018). Structural firm characteristics include firm size, age, profitability, leverage, and ownership offer valuable insights into a company's position within its industry. Capital-related variables, such as liquidity and capital intensity, shed light on the financial foundation of a firm. Moreover, market related variables include industry type, environmental uncertainty and market environment while capital related variables consist of liquidity and capital intensity (Gachoka et al., 2018). This study centres on examining some structural and capital-related aspects of firm characteristics, namely profitability, leverage, firm size, age, tangibility and liquidity.

Companies with high levels of profitability should be able to contribute more to their environmental performance compared to companies with low profitability. According to Lucyanda and Siagian (2012), high profits will receive more attention from the public so the company will incur costs to overcome the environment in order to maintain its reputation. Firm leverage measures a business's reliance on debt and equity funding for operations and investments (Chukwuebuka & Okonkwo, 2020). The debt-to-equity ratio serves as a standard metric to evaluate a company's leverage, with a lower ratio indicating a more conservative capital structure, and a higher ratio suggesting a greater reliance on debt financing (Purnamasari & Suryatama, 2021). Leverage impacts a company's risk-return profile, as additional debt amplifies both potential profits and losses, depending on the returns generated from investments (Cathcart et al., 2020).

The size of a firm may have a notable impact on its environmental disclosure practices, shaping the extent and nature of its reporting. Large companies will also get a lot of pressure from the community; the demand to preserve and preserve the environment will be taken into consideration and more attention because it is directly related to the company's image. Firm age, describing the period since a company's inception, plays a significant role in shaping its maturity, experience, and development over time (Orajekwe & Ogbodo, 2023 and Fan & Wang, 2021). New businesses in their early phases focus on setting up operations, expanding clientele, and becoming profitable, while older firms go through various growth stages, such as market expansion and product diversification (Chege et al., 2020). Tangibility refers to the tangible elements of a service, such as the physical facilities, equipment, and appearance of the firm. Liquidity is the company's ability to finance short-term debt. High level of liquidity illustrates the efficiency of companies in using or utilizing working capital (Acero & Alcalde, 2020).

Empirical Review and Hypotheses Development

Several studies have evaluated the relationship between firm characteristics and environmental performance within and outside Nigeria the notable among them are, Ghosh et al. (2023) examined how far corporate governance and firms' characteristics are relevant toward

environmental sustainability of non-financial NSE 100 listed? The sample includes 78 non-financial NSE 100 listed companies from 2010 to 2020. The empirical findings of this study indicate that board size is negatively related with environmental sustainability. Similarly a positive influence of age, size and market-based financial performance can be seen on sustainability of the firm. Similarly, Younis and Sundarakani (2020) reported that larger companies allow capital and better accessibility of manpower to obtain environmentally friendly machinery and equipment in their operations. Furthermore, companies with higher debt ratios have superior endeavors and higher inspiration for developing a company's environmental sustainability (Andrikopoulos & Kriklani, 2013).

Orajekwe and Ogbodo (2023) investigated the relationship between firm attributes and environmental disclosure among energy corporations in Nigeria. The research utilized a causal-comparative research design, focusing on energy corporations listed on the Nigerian Exchange Group (NXG) from 2013 to 2022. The sample included nine quoted firms primarily operating in the oil and gas, utility, and natural resource sectors. Secondary data from annual reports and financial statements of selected energy firms were used, and the Multiple Linear Regression **a**pproach established the causal relationship between firm attributes and environmental disclosure. The findings revealed that larger and older firms faced challenges in providing detailed environmental information due to operational complexity and established reporting practices. However, firm leverage did not significantly impact environmental disclosure.

Akhter et al. (2022) investigated whether profitability, business size, leverage ratio, firm age, participation of independent members on the board, and gender diversity have any influence on environmental disclosure procedures listed financial and non-financial organisations. The research was conducted with the framework of legitimacy theory in mind. Moreover, multiple linear regressions were used to analysis the data generated from annual report of the sample firms for a period of five years (2015-2019). The results show leverage ratio and business size have significant and positive impact on environmental reporting. Similarly, Anh-Tuan et al. (2022) investigated the variables influencing the amount of environmental accounting information disclosed based on hotel managers' perceptions. To gauge how managers feel about the topic of environmental accounting disclosure, the author has relied on past research, particularly that of those with access to source data. Managers at 216 different hotels and related businesses provided the data. The extent to which various variables affect the disclosure of environmental accounting information is evaluated using quantitative research approaches. Managers' perspectives, regulatory restrictions, profits, company size, and societal pressure were all shown to have an impact on the disclosure of environmental accounting information.

Boshnak (2022) investigated the factors that determine Corporate Social and Environmental Voluntary Disclosure (CSEVD) practices in Saudi Arabia to address the dearth of research in this area for Saudi-listed companies. The study employs CSEVD items from the Global Reporting Initiative-G4 criteria to conduct manual content and regression analysis on online annual report data for Saudi nonfinancial listed enterprises from 2016–2018. Due to new corporate governance laws and IFRS adoption, the models suggest that Saudi company CSEVD has grown over time, resulting in an average of 68% disclosure. The models also revealed company size, leverage and government ownership have significant and positive impact on CSEVD. Also, profitability of a company, the size of an auditing firm, the age of a company and institution ownership do not affect CSEVD.

Oranefo (2022) examined the effect of firm profitability on the environmental performance of quoted conglomerates firms in Nigeria. Ex-post facto research design was adopted for this study.

The population of the study was constituted by all the five (5) conglomerate firms listed on the Nigerian Exchange from 2011 to 2020. Data were derived from the financial statements of the selected firms over the years of interest. Ordinary Least Square multiple regression analysis was used at 5% level of significance. The findings revealed that firm profitability significantly affects waste management expenses of quoted conglomerates firms in Nigeria. Similarly, Rini and Adhariani (2020) reported that firms with better financial performance are found to engage themselves in environmental actions because they distribute their expenditure to various environmental information and aspects.

According to Thaker et al., (2020), company size has a positive effect on the company's environmental performance. More so, Egolum et al. (2019) assessed the effect of firms' characteristics on corporate environmental performance of quoted industrial goods firms in Nigeria from 2008-2017. The population of the study is made up of eleven industrial goods firms quoted on the Nigerian stock exchange. Complete enumeration of the population was adopted as the sample size. This study utilized secondary data sourced from annual reports and accounts of the sampled firms for the study period. Inferential statistics of the hypotheses were tested using Pearson correlation coefficient and multiple regression analysis. The result of findings revealed that firm characteristics (proxied by firm size, profitability and firm age) have a significant positive effect on environmental performance.

Onyali and Okafor (2018) examined the effect of firm characteristics on corporate environmental performance of quoted industrial goods firms in Nigeria. The study adopted the ex-post facto research design. The population and sample size of the study is made up of eleven industrial goods firms quoted on the Nigerian Stock Exchange as at the year, 2017. This study utilized secondary data sourced from annual reports and accounts of the sampled firms for the study period, 2008-2017. Specifically, the study captured firm size, profitability and firm age as firm characteristics variable on waste management cost as proxy for corporate environmental performance. Data analysis was done using Pearson correlation coefficient and Multivariate regression analysis. Findings of the study revealed that firm attributes (firm size, profitability and firm age) have a significant and positive effect on environmental performance (measured by waste management cost) at 5% significant level. Also, Wuttichindanon (2017) examined the determinants of corporate social responsibility disclosure of firms listed on the Stock Exchange in Thailand. The result shows that firm age and firm size positively associated with environmental responsibility performance. This implies that when a firm matures, its reputation and history of involvement in environmental responsibility performance become entrenched. Uwigbe (2011) uses profit, financial leverage and firm size as firm characteristics in relation to the level of environmental reporting practices using data covering the period of 5 years (2005-2009).

Majority of the studies mentioned above indicate that there is a relationship between firm characteristics and environmental performance, suggesting that firms characteristics is a major determinant of environmental performance practices understanding this relationship can help firms make more informed decisions about how to improve their environmental performance and achieve their sustainability goals. Furthermore, those studies highlight the importance of considering environmental performance in a wide range of industries and contexts. By understanding the factors that contribute to environmental performance, companies can develop strategies to manage their environmental impact and improve their sustainability. Building on this outcome, the following null hypotheses were formulated to guide the study:

HO_1: Profitability does not have a significant impact on environmental performance of consumer goods companies in Nigeria.
HO_2: Leverage does not have a significant impact on environmental performance of consumer goods companies in Nigeria.
HO_3: Tangibility does not have a significant impact on environmental performance of consumer goods companies in Nigeria.
HO_4: Firms' size does not have a significant impact on environmental performance of consumer goods companies in Nigeria.
HO_5: Firms' age does not have a significant effect on environmental performance of consumer goods companies in Nigeria.
HO_6: Firms' liquidity does not have a significant effect on environmental performance of consumer goods companies in Nigeria.

Theoretical Review

The stakeholder theory and the legitimacy theory were deployed for this study. Stakeholder theory as propounded by Freeman (1984) is useful in explaining why managers are accountable to a larger group of stakeholders (Ajape, 2019). Rather than focusing solely on shareholders, the proposal aims to create value for all stakeholders. As a result, environmental performance serves as an avenue for firms to convey their efforts towards achieving a sustainable environment to stakeholders and prospective investors. Environmental performance cannot be separated from stakeholder theory. Stakeholder theory shows that the community and the community have direct and indirect relationships and interests with the company. As revealed by Greenwood (2007), an approach to stakeholders is an obligation that must be carried out by the company. Companies need to disclose the impact of business operations on the environment so that stakeholders can assess their environmental performance (Nohong et al., 2019).

Legitimacy theory nestles on "Social Contract" concept which assumes that a social contract exists between firms and individual members of society, and that various disclosure strategies must be considered in order to bridge the legitimacy gap between the firm and its operating environment. On the other hand, ED is seen as a powerful tool for influencing public opinion and articulating the scope of a firm's practical contribution to the environment where its economic activities are carried on (Ajape, 2019).

Environmental performance is related to how well the company manages the environmental aspects of activities, products, services and their impact on the environment. In line with the theory of legitimacy, if the company's environmental performance is good then public opinion of the company will increase, and vice versa. When public opinion of the company is good, the company's position in the public eye is also good (Aulia & Agustina, 2015). Therefore, companies with good environmental performance need to spend money on waste management and disclose information on the quantity and quality of the environment better than companies with worse environmental performance. Acoording to Salawu (2021), firms that want to be held accountable to the society and also wish to be seen as having community legitimacy must be socially and ecologically responsible. The more people believe a firm is environmentally conscious, the more likely they are to increase their patronage, resulting in increased social acceptance, lower security and maintenance costs, increased market share and profitability, and a reduction in the cost of resolving conflicts for the firm to the bare minimum.

In summary, based on legitimacy theory and stakeholder theory, firms have a corporate responsibility to enhance company's reputation to society and stakeholders through their information to strengthen relationships with all stakeholders. Firms with excellent environmental

performance are more motivated to keep their investors and stakeholder informed through environmental disclosure and performance (Boshnak, 2022; Deswanto & Siregar, 2018).

Methodology

This study used correlational research design and is carried out based on historical panel data. The design is used to explore causal relationship between firm characteristics and environmental performance. Companies listed on the Nigerian Exchange Group in the consumer goods sector between 2011 and 2022 were selected as the research population. The consumer goods companies and their years of incorporation and listing are shown on Table 1 below:

Table 1: Population and Sample of the Study

S/No.	Name of Company	Year of Incorporation	Year of Listing	Sample Size
1.	BUA Foods Plc.	2005	2022	Removed
2.	Cadbury Nigeria Plc.	1965	1976	1
3.	Champion Breweries Plc.	1974	1983	2
4.	Dangote Sugar Refinery Plc.	2005	2007	3
5.	Dn Tyre & Rubber Plc.	1961	1974	Removed
6.	Flour Mills of Nigeria Plc.	1960	1978	4
7.	Golden Guinea Breweries Plc.	1962	1979	Removed
8.	Guinness Nigeria Plc.	1950	1965	5
9.	Honeywell Flour Mill Plc.	1985	2009	6
10.	International Breweries Plc.	1971	1995	7
11.	McNichols Plc.	2004	2009	Removed
12.	Multi-Trex Integrated Foods Plc.	1999	2010	Removed
13.	Northern Nigeria Flour Mills Plc.	1971	1978	8
14.	Nascon Allied Industries Plc.	1973	1992	9
15	Nestle Nigeria Plc.	1961	1979	10
16.	Nigerian Breweries Plc.	1946	1973	11
17.	Nigerian Enamelware Plc.	1960	1979	12
18.	PZ Cussons Nigeria Plc.	1948	1972	13
19.	Unilever Nigeria Plc.	1923	1973	14
20.	Union Dicon Salt Plc.	1991	1993	15
21	Vitafoam Nigeria Plc.	1962	1978	16

Source: Generated from https://ngxgroup.com/exchange/trade/equities/listed-companies/ on 20th January, 2024

The population of the study comprises of the twenty-one listed consumer goods companies and for a company to qualify as a sample for the study, a set of specified criteria (purposive sampling) were to be met: first, the firm must be fully listed on the NGX market for the entire period of the study (2011-2022), and second the companies must have the complete set of data covering the period of the study. The essence of these filters is for the purpose of getting complete set of data for the period covered in the study. Thus, following the specified criteria above, sixteen (16) firms were qualified to form sample size as shown in Table 1 above. Hence, data for the study was sourced from the secondary source, basically from the annual financial statements of the sampled companies. This study uses the descriptive and multiple regression analysis (GLS) as techniques of data analysis. The choice of multiple regression is centered on its ability to predict empirical relationship. Table 2 presents the variables of the study and their measurement.

Table 2: Variables of the Study and their Measurements

S/N	Names	TAG	Variables	Measurement	Sources
1	Environmental Performance	EP	Dependent	The amount spent on waste management cost divided by total assets	Ighoroje and Ozigbo (2023), Oranefo (2022), Egolum et al. (2019) and Onyali and Okafor (2018).
2	Profitability	ROA	Independent	Earnings before tax divided by total asset.	Ghosh et al. (2023), Ighoroje and Ozigbo (2023), Orajekwe and Ogbodo (2023) and Onyali and Okafor (2018).
3	Leverage	DBR	Independent	Total debt divided total assets	Orajekwe and Ogbodo (2023), Adekanmi (2022) and Alaeto (2020).
4	Tangibility	TAN	Independent	Fixed Assets/ Total Assets	Adekanmi (2022), Bello and Lasisi (2020) and Nguyen (2015).
5	Firm Size	FSIZE	Independent	Natural logarithm (Ln) of total asset.	Ghosh et al. (2023), Orajekwe and Ogbodo (2023) and Onyali and Okafor (2018).
6	Firm Age	AGE	Independent	Year of study minus year of incorporation	Ghosh et al. (2023), Orajekwe and Ogbodo (2023) and Onyali and Okafor (2018).
7	Liquidity	LIQ	Independent	Current assets divided by current liabilities	Orajekwe and Ogbodo (2023), Alaeto (2020) and Dewasiri e t al. (2018).

Sources: Generated by Researcher from Literature Reviewed

Model Specification

The model used in this study was adapted from the framework of Orajekwe and Ogbodo (2023) and Onyali and Okafor (2018) where they ascertained the influence of firm characteristics on environmental performance of listed consumer goods companies in Nigeria. A multivariate regression equation was set up to test the hypotheses formulated in section one this study which is to access the impact of firm characteristics on environmental performance. To test the six hypotheses, the study estimated the following regression equations. The equation examines the firm characteristics on environmental performance of consumer goods companies listed on NGX:

$EP_{it} = \beta 0_{it} + \beta_1 ROA_{it} + \beta_2 DBR_{it} + \beta_3 TAN_{it} + \beta_4 FSIZE_{it} + \beta_5 AGE_{it} + \beta_6 LIQ_{it} + \mu it$ -------equation 2

Where:

EP_{it} = Environmental performance of company í in period t
ROA_{it} = Return on assets of company í in period t
DBR_{it} = Debt ratio of company í in period t
TAN_{it} = Tangibility of company í in period t
$FSIZE_{it}$ = Firm size of company í in period t
AGE_{it} = Firms age of company í in period t
LIQ_{it} = Liquidity of company í in period t
μit = Error Term company í in period t

Decision Rule

Reject the Null Hypothesis if the P-value of the test is less than α-value (level of significance) at 5%; otherwise fail to reject Null Hypothesis.

Results and Discussions

This section presents the result of data analysis that includes descriptive statistics, correlation matrix and regression results.

Descriptive Statistics of the Study Variables

Table 3 provides a summary of statistics for the variables of the study, such as mean, standard deviation, minimum and the maximum of both the dependent and explanatory variables. The Table shows the summary statistics of the dependent and explanatory variables to appreciate the nature of the results adequately. The descriptive statistics analyzes the essential feature of firm characteristics and environment performance. It provides a necessary insight into the quality of the data upon which analysis was done.

Table 3: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
EP	208	0.0035	0.0027	0	0.0093
ROA	208	0.0788	0.1268	-0.2263	0.3023
DBR	208	0.5092	0.1609	0.0874	0.7864
TAN	208	0.4353	0.1897	0.0814	0.832
FSIZE	208	10.4911	0.8927	7.8355	11.7933
AGE	208	51.125	18.6118	5	99
LIQ	208	1.5330	0.5516	0.2192	2.9662

Source: Generated using Stata Version 14.

Table 3 shows that the mean value of environmental performance is 0.0035 with standard deviation of 0.0027. This implies that there exists no significant variation among the values of environmental performance across the listed consumer goods companies in Nigeria during the periods. The minimum value is 0.000, shows that some listed consumer goods companies in Nigeria do not spent a kobo on waste management while the maximum of amount spent on waste management is 0.0093. ROA has a mean value of 0.0788 (8%) reflecting that most companies have achieved profits in the current period. The distribution of ROA data is quite diverse, marked by a standard deviation of 0.1268 (13%), which is larger than the mean. This result shows that the distribution of profit data on total assets is relatively diverse because it is greater than the average value. The minimum is -0.2263 (-23%) and maximum values of 0.3023 (30%) respectively. Similarly, the financial leverage of the sampled firms in Nigeria on the other hand, stands at an average of 0.5092 (51%) with standard deviation of 0.1609 (16%) which implies that the firms which constitute the sample firms are almost 51% of debt and 49% of equity. However, some of the firms are highly geared at 0.7864 (79%) debt to assets based on the maximum while some has ratio of debt to total assets as low as 0.0874 (9%). The mean tangibility of 0.4353 (44%) in Table 4 showed that on the average the proportion of Property Plant, and Equipment (PPE) in total assets of listed manufacturing companies was 44 percent. With a standard deviation of 0.1897 (19%) further lends credence to the spread of the data. Meanwhile, firm size has a mean value of 10.4911 with a standard deviation of 0.8927. Also, firm age shows an average age of 51 years, a minimum age of 5 years and maximum age of 99 years. Lastly, liquidity has an average value of 1.5330 with a standard deviation of 0.5517 signifies low variation among the sampled firms. The correlation matrix as presented in Table 4 shows the association link between independent variable and the dependent variable.

Table 5: Correlation Matrix

Variables	EP	ROA	DBR	TAN	FSIZE	AGE	LIQ	VIF
EP	1.0000							
ROA	-0.0420	1.0000						1.19
DBR	-0.1015	0.1562	1.0000					1.20
TAN	0.1851	-0.1695	-0.0511	1.0000				1.37
FSIZE	0.1382	0.3379	0.3744	0.0251	1.0000			1.45
AGE	-0.0281	0.0040	0.1886	-0.0315	0.3046	1.0000		1.13
LIQ	-0.0033	0.1600	-0.0312	-0.4832	0.1262	0.0408	1.0000	1.37

Source: Stata Version 14 Output

The correlation results illustrate the relationships between the independent variables (profitability, leverage, tangibility, firm size, Age, and liquidity) and environmental performance practice as well as the relationship among the independent variable. The negative correlation coefficient of -0.0420, -0.1015, -0.0281 and -0.0033 between independent variable (ROA, DBR, AGE and LIQ) and environmental performance indicate that as those variables increase, the level of environmental performance practice. Meanwhile, the positive correlation coefficients between environmental performance and tangibility (0.1851) and firm size (0.1382) suggest that high tangibility and firm size may have slightly higher levels of environmental performance practice of listed consumer goods companies in Nigeria, though these relationships are relatively weak.

However, to determine the presence of Collinearity problem, a Variance Inflation Factor (VIF) Tolerance test was carried out, the results of which provided evidence of the absence of Collinearity. This is because the results of the VIF test ranges from a minimum of 1.45 to a maximum of 1.13, which suggests absence of Multicolleanirity in the model (Muhammad, 2009). This is because, all the VIF values are less than 10 and the mean VIF is just 1.28.

Regression Analysis

The regression result showing the impact of the independent variable on dependent variable as shown in Table 5 below:

Table 5: Impact of Firm Characteristics on Environmental Performance

	Ordinary Least Square (OLS)			
	Coef.	**Std. Err.**	**T**	**P>/t/**
ROA	-0.0016	0.0016	-1.00	0.321
DBR	-0.0026	0.0013	-2.03	0.043
TAN	0.0028	0.0011	2.42	0.016
FSIZE	0.0007	0.0002	2.78	0.006
AGE	0.0958	0.0001	-0.91	0.365
LIQ	0.0004	0.0004	0.89	0.373
_CONS.	-0.0036	0.0024	-1.52	0.129
R-Squared	0.0865			
Adj R-Squared	0.0592			
Number of Obs.	208			
Wald chi2(7)	49.62			
Prob>F.	0.0000			
Heteroskedasticity	0.9020			
Hausman Test	(Prob>Chi) 0.9990			
Breusch and Pagan Lagrangian multiplier test for random effects. Prob > chibar2 = 0.0746				

Source: Stata Output 14.0

Table 5 presents the regression results of OLS for model. The OLS result was selected for model one due to the fact that Hausman result (0.9990). Furthermore, Breusch and Pagan Lagrangian Multiplier test for random effects was 0.0746 for model reveal that OLS result is more efficient than random effect result which is greater than 5%. The OLS reveals overall R^2 of 0.0865, as a determination coefficient which indicates that the firm characteristics have affected environmental performance practice by 9%. In comparison, the remaining 91% is allegedly affected by other factors beyond the firm characteristics in this research in model. The result shows that firm characteristics such as leverage, tangibility and firm size have negative and significant effect on environmental performance while firm characteristics (profitability, age and liquidity) has positive and insignificant effect on environmental performance of listed consumer goods companies in Nigeria.

Test of Hypothesis I

$H0_1$: Profitability does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for profitability (ROA) is -0.0016, with a p-value of 0.321. Since the p-value is greater than the significance level of 0.05, the study fail to reject the null hypothesis and conclude that profitability has insignificant effect on the environmental performance of consumer goods companies in Nigeria. This finding is consistent with the work of Akhter et al. (2022) and Boshnak (2022) and contrary to the works of Anh-Tuan et al. (2022) and Oranefo (2022).

Test of Hypothesis II

$H0_2$: Leverage does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for firm debt ratio is -0.0026, with a p-value of 0.043. Since the p-value is less than the significance level of 0.05, the study reject the null hypothesis and conclude that leverage has significant effect on the environmental performance of listed consumer goods companies in Nigeria. This finding is consistent with the work of Akhter et al. (2022), Andrikopoulos and Kriklani (2013) and contrary to the works of Orajekwe and Ogbodo (2023).

Test of Hypothesis III

$H0_3$: Tangibility does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for tangibility (TAN) is 0.0028, with a p-value of 0.016. Hence, the p-value is less than the significance level of 0.05, the study reject the null hypothesis and conclude that tangibility has significant effect on the environmental performance of listed consumer goods companies in Nigeria. This finding is consistent with the work of Anh-Tuan et al. (2022), Thaker et al., (2020) and Uwigbe (2011).

Test of Hypothesis IV

$H0_4$: Firm size does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for firm size (FSIZE) is 0.0007, with a p-value of 0.006. Since the p-value is less than the significance level of 0.05, the study reject the null hypothesis and conclude that firm size has significant effect on the environmental performance of listed consumer goods companies in Nigeria. This finding is consistent with the work of Ghosh et al. (2023), Akhter et al. (2022), Anh-Tuan et al. (2022), Thaker et al., (2020), Younis and Sundarakani (2020) and Uwigbe (2011) and inconsistency with the studies of Akhter et al. (2022) and Boshnak (2022).

Test of Hypothesis V

$H0_5$: Firm age does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for firm age (Age) is 0.0958, with a p-value of 0.365. Since the p-value is greater than the significance level of 0.05, the study fail to reject the null hypothesis and conclude that firm age has insignificant effect on the environmental performance of listed consumer goods companies in Nigeria. This finding is consistent with the work of Akhter et al. (2022) and Boshnak (2022) and contrary to the works of Ghosh et al. (2023), Orajekwe and Ogbodo (2023) and Egolum et al. (2019).

Test of Hypothesis VI

$H0_6$: Liquidity does not have a significant impact on environmental performance of consumer goods companies in Nigeria.

The regression coefficient for liquidity (LIQ) is 0.0004, with a p-value of 0.373. Therefore, the p-value is greater than the significance level of 0.05, the study fail to reject the null hypothesis six and conclude that liquidity has insignificant effect on the environmental performance of consumer goods companies in Nigeria. This finding is consistent with the work of Onyali and Okafor (2018) and Wuttichindanon (2017).

Conclusion and Recommendation

This study examines the impact of firm characteristics on environmental performance of listed consumer goods companies in Nigeria. The results show that leverage, tangibility and firm size have significant impact on environmental performance of the listed consumer goods companies in Nigeria. This indicates that large companies tend to spend on waste management. This is because large firms have practice environmental performance responsibility to both shareholders and stakeholders, related to legitimacy theory and stakeholder theory. Also, for firm size larger firms tend to have more extensive operations, supply chains, and production capabilities which mean that their environmental impact is often more significant, attracting greater attention from stakeholders. As a result, larger companies face higher expectations and pressures to disclose detailed environmental information, because of these demands and maintain transparency, these firms are more likely to engage in comprehensive environmental performance. Meanwhile, profitability, firm age and liquidity have insignificant effect on environmental performance. This can be explained that firms do not put profits into consideration when they prepare environmental performance practice.

The study therefore based on its results recommends that management of listed consumer goods companies in Nigeria should take into account factors such as leverage, tangibility and firm size when deciding on to spend on waste management for environmental performance. Also, management should embracing environmental performance practice in their plan which may elevate a company's image, maintain transparency, engender trust, and secure its place as a frontrunner in the race towards a sustainable and profitable future. Furthermore, to promote better environmental performance practice in these companies, policymakers can consider implementing regulatory frameworks that encourage companies to engage in environmental performance. Additionally, they can provide incentives for firms that demonstrate proactive efforts in environmental performance and its commitment to sustainability.

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