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MANAGING THE ECO-ENVIRONMENTAL COST AND FIRMS PERFORMANCE IN NIGERIA: THE PUBLIC CONSUMER GOODS FIRMS IN PERSPECTIVE

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ABSTRACT

This study evaluated how the management of listed consumer goods firm's eco environmental cost affects its performance in Nigeria. Utilising extracts from the audited financial statements of 16 firms sampled from a population of 21 consumer goods firms listed on the Nigerian Exchange Group for the period 2012 – 2023, the study specifically ascertained the effect of Employee Health and Safety Disclosure (EHSD), Pollution Control Disclosure (PCD) and Environmental Remediation Disclosure (ERD), on return on capital employed (ROCE) of these listed consumer goods firms in Nigeria. As a result, the ex-post facto research design was adopted in the study. Descriptive analysis was used to summarize the data collated while estimates from Robust Least Square regressions were used to test the hypotheses, which found that Employee Health and Safety Disclosure (EHSD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.275, p = 0.0000); Pollution Control Disclosure (PCD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.625, p = 0.0000) and Environmental Remediation Disclosure (ERD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.141, p = 0.0000). In view of these, the study concluded that as the marketplace becomes more competitive, companies may benefit from adopting a more strategic approach to their environmental communication, emphasizing disclosures that yield positive financial outcomes while efficiently managing the costs associated with those that have adverse effects. The study recommends among others that Human Resources (HR) departments should prioritize the enhancement of employee health and safety measures. This involves conducting regular assessments and implementing necessary improvements to ensure compliance with health and safety regulations, thereby minimizing potential negative impacts on financial performance.

Key words: *Eco-Environmental Cost, Employee Health and Safety Disclosure, Environmental Remediation Disclosure, Performance, Pollution Control Disclosure, Return on Capital Employed.*

INTRODUCTION

Nigeria faces significant obstacles in containing environmental deterioration as a developing country with an abundance of natural resources (Korolo & Korolo, 2024). Increased industrialization and economic development have led to increased industrial accidents and exposure to hazardous chemicals and toxic substances, which affect the health of workers and the environment. Amponsah and Dartey, 2011 larmented that employees in the Nigerian industrial and consumer goods are highly susceptible to hazardous substances in their work

environment and which adversely affect the health of workers. The need to promote healthier and safer working conditions is increasingly recognized as a broad notion that affects the standard of living of workers, as well as its significant impact on the social environment.

In Nigeria for instance, environmental cost accounting is not considered a mandatory requirement for firms that are listed in the nation's stock market, regardless of this practice of voluntary disclosure, Studies have shown the existence of a positive link between environmental accounting disclosures and profitability of firms (Ogoun & Ekpulu, 2020; Menike, 2020). However, quite a few other studies maintain that a negative or mixed association exists between environmental accounting and financial performance of entities (Azzam & Alqudah, 2020; Dibia & Onwuchekwa, 2015). Indeed, financial performance is a major key in all economic decision making relating to public and private companies to identify the difficult and hidden cost (Okere et al., 2022). It is a quantitative ration of how well a firm uses asset from its business operations and generate revenues. Performance is also seen as a measure of a firm's overall financial health over a given period of time.

Discrepancies in findings and submissions from majority of these studies as Ogoun and Ekpulu, (2020); Menike (2020); Azzam and Alqudah (2020); Dibia and Onwuchekwa (2015), could partly be attributed to contemporary developments and partly to different statistical test techniques employed by the researchers. These mixed and inconclusive findings elicited the researcher to conduct this study as a response to mitigate these gaps and consequent addition to the existing body of knowledge.

Objectives

The main objective of the study is to ascertain the effect of Eco-Cost management on financial performance of Consumer Goods Firms listed on the Nigerian Exchange Group. The specific objectives are to:

1. determine the relationship between Employee Health and Safety Disclosure (EHSD) and Return on Capital Employed (ROCE) of consumer goods firms listed in Nigerian Exchange Group.
2. ascertain the effect of Pollution Control Disclosure (PCD) on Return on Capital Employed (ROCE) of consumer goods firms in Nigeria.
3. investigate the effect of Environmental Remediation Disclosure (ERD) on Return on Capital Employed (ROCE) of Listed consumer goods firms.

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Hypotheses

To achieve the objectives of the study, the researcher formulated and tested the following research hypotheses.

H_{o1}: Employee health and safety disclosure has no significant effect on return on capital employed (ROCE) of consumer goods firms in Nigeria.

H_{o2}: Pollution control disclosure has no significant effect on the return on capital employed (ROCE) of consumer goods firms in Nigeria.

H_{o3}: Environmental remediation disclosure has no significant effect on return on capital employed (ROCE) of consumer Goods firms in Nigeria.

LITERATURE REVIEW

Employee Safety and Health Cost Disclosure

The goal of health and safety is to safeguard and promote the physical and mental well-being of those who work for the company (Amahalu, Agbionu & Obi, 2017). This entails creating and implementing health and safety plans, monitoring and reporting performance concerns to internal and external stakeholders, and doing most other management functions as well. Employees' Health and Safety Compliance Cost is the costs incurred in caring for the safety and health of the employees of an establishment (Chinedu, Udama & Ali 2019). Employees can learn new skills and information and promote quality work practices by paying for it, which will transform their behavior at work. Effective staff training can prevent and replace workplace mishaps while also boosting productivity, knowledge, and morale (Alpheaus & Nwankwo 2024).

Health and safety cost are geared towards securing and promoting safety and health of staff, both physical and mental. Safe workplaces are profitable work-places and, as such, activity should be carried out to preserve the health of employees, sub-contractors, and the general public (Oshiole et al., 2020). Employees and safety include the physical, mental and emotional well-being of employees while carrying out their duties and thereby having a positive impact on the achievement of organizational goals. Employee health and Safety costs are those costs incurred in programs created to protect employees from organizational activities; product and service risks (Ibrahim et al 2023). The dual duty of employers is to the health, safety and well-being of employees and other people the business may be affected (Ibrahim et al, 2023).

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Pollution Control Cost Disclosure

Pollution control is the reduction or elimination of pollution at the source (source reduction) instead of at the end-of-the-pipe or stack (Alpheaus & Nwankwo, 2024). This practice occurs when raw materials, water, energy, and other resources are used more efficiently; when less harmful substances are substituted for hazardous ones; and when toxic substances are eliminated from the production process (Nzekwe, 2022). Accordingly, pollution control is any action (large or small) that reduces the amount of contaminants released into the environment. By implementing pollution prevention processes, fewer hazards will be posed to both public health and natural wellbeing (Alpheaus & Nwankwo, 2024).

In practice, human health ought to be safeguarded by firms economic security bolstered, and environment maintained by lowering the use and manufacturing of dangerous materials towards running its operations more effectively (Amahalu et al., 2018). Industries frequently gain from the adoption of pollution prevention strategies and practices since it reduces operating and environmental compliance expenses for businesses. As a concept, pollution control costs saves industrial production process costs and creates a new source of income (Shiyghan, Mukah & Vukenkeng, 2024). Several pollution prevention costs are quite cheap to implement and can be relatively profitable. Others must be analyzed carefully to consider their profitability. The analysis involved is in a current process and is likely a pollution prevention option (Okezie et al., 2019) The costs of pollution to society are of two kinds, costs that arise if no action is taken to address pollution, and the costs that arise if action is taken (Nwanwu, 2022). According to Cost Accounting Standard - 14 (CAS - 14) issued by the Council of The Institute of Cost Accountants of India on "Pollution Control Cost". Pollution Control means the control of emissions and effluents into environment. It constitutes the use of materials, processes, or practices to reduce, minimize, or eliminate the creation of pollutants or wastes. It includes practices that reduce the use of toxic or hazardous materials, energy, water, and / or other resources. Pollution Control costs is the aggregate of direct and indirect cost relating to Pollution Control activity.

a. **Direct cost** includes the cost of materials, consumable stores, spares, manpower, equipment usage, utilities, resources for testing & certification and other identifiable resources consumed in activities such as waste processing, disposal, remediation and others.
b. **Indirect cost** includes the cost of resources common to various Pollution Control activities such as Pollution Control Registration and such like expenses.

c. **Costs of Pollution**: Control which are internal to the entity should be accounted for when incurred. They should be measured at the historical cost of resources consumed.
d. **Pollution control cost** is an investment that guarantees long-term returns. It is true that the damage caused by pollution is much greater than the investment required to implement a comprehensive and sustainable pollution control system (Jonah & Aaron 2023). Pollution is an indicator of system inefficiency, representing a waste of global resources, an economic burden for countries and a financial loss for businesses. As a result, the companies are facing increasing opposition from the public. To reduce pollution, inefficiencies must be eliminated.

Environmental Remediation Cost Disclosure

Environmental remediation, encompassing remedial actions taken to address contamination, pollution, and ecological damage caused by oil and gas operations, stands at the forefront of efforts to mitigate environmental risks and ensure long-term environmental sustainability (Abiola & Agboola, 2022). It is the process of cleaning up, restoring, and rehabilitating contaminated sites, polluted areas, hazardous waste sites, and degraded environments to protect human health, safeguard ecosystems, preserve natural resources, and prevent further environmental damage (Ubokudom et al 2024).

Environmental remediation aims to reduce, remove, treat, contain, control, minimize, isolate, or neutralize pollutants, contaminants, toxins, chemicals, pathogens, radiations, wastes, emissions, discharges, spills, leaks, releases, exposures, impacts, risks, hazards, threats, disturbances, disruptions, and liabilities that pose risks to public health, safety, welfare, environment, biodiversity, ecosystems, habitats, water quality, soil quality, air quality, food safety, and quality of life (Egedegu, Ombu & Etale 2024) . The practice is usually carried out by companies to reduce the environmental impact of their economic activities. Therefore, all costs associated with environmental remediation is referred to as environmental remediation cost. (Ubokudom et al 2024). According to Amahalu et al. (2018), environmental remediation costs has significant effect on the performance of companies in Nigeria

On the other hand; Environmental Remediation costs means all costs and expenses of actions or activities to cleaning up or removal of hazardous materials from the environment; preventing or minimizing the further movement, leaching or migration of hazardous materials in the environment; preventing, minimizing, or mitigating the release or threatened release of hazardous materials into the environment, or injury or damage from such release, and comply

with the requirements of any environmental laws (EPA, 2022). Environmental remediation costs include, without limitation, costs and expenses payable in connection with the foregoing for legal, engineering or other consultant services, for investigation, testing, sampling, and monitoring, for boring, excavation, and construction, for removal, modification or replacement of equipment or facilities, for labor and material, and for proper storage, treatment, and disposal of hazardous materials (Burnett & Hansen 2017). Remediation cost means all costs associated with performing work to remediate contamination of real property or groundwater, including engineering and other professional fees and expenses, costs to remove, transport and dispose of contaminated soil, costs to "cap" or otherwise contain contaminated soil, and costs to pump and treat water and monitor water quality (Bartolomeo, Bennett, Bouma, Heydkamp, James, &Wolters, 2012).

Return on Capital Employed (ROCE)

The term 'Return' means the profits available. Thus, the ROCE ratio points out the relation between the volume of capital invested and the amount of profits earned on such capital (Pradip, 2017). Speaking otherwise, this ratio explicit the profitability of a firm by establishing relationship between profits and capital invested. It is probably one of the most frequently used ratios for assessing the performance of organizations. Also Return on capital employed (ROCE) refers to a financial ratio that can be used to assess a company's profitability and capital efficiency. In other words, this ratio can help to understand how well a company is generating profits from its capital as it is put to use. ROCE is one of several profitability ratios financial managers, stakeholders, and potential investors may use when analyzing a company for investment (Hayes, 2024).

ROCE, a member of the Return On Investment ratio, can be determined taking profits and capital employed of a given firm. ROCE highlights the earning potentiality of a firm's assets indicating the nature of profit earning capacity of a firm in response to its long-term sources of capital employed in the acquisition of its assets. It provides substantial clues to the nature of utilisation of long-term funds made available to the firm by owners and creditors. It also helps in evaluating how efficiently the funds are being managed by the management. The higher the ratio, the more efficiently the funds have been used by the management. In other words, a high ROCE achieved for a consecutive year indicates that the firm has a stable financial position with sound future prospect. ROCE provides an indication of the economic productivity of capital. Thus, it provides a standard measure of operating efficiency, which is very often applied regardless of the type of business or sub-division within a single

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organization in as much as it is not affected by the long-term capital structure and other factors external to the influence and immediate management.

ROCE = Return on capital employed indicates firm's profitability and is calculated as the net profit after taxes plus interest on long term liabilities scaled by total capital employed (shareholders' equity plus long term liabilities) as at the end of the financial year under investigation (Okore, 2021). After all, equity owners and providers of long term liability combined have claims on the assets of the firm. This measure of financial performance is considered the best as it shows the earnings power of a firms taking into account the interest of all stakeholders.

$$\text{ROCE} = \frac{\text{EBIT}}{\text{Capital Employed}}$$

Where:

EBIT=Earnings before interest and tax

Capital Employed=Total assets − Current liabilities

Theoretical Review

Polluter Pays Principle Theory (PPP)

The Polluter-Pays Principle was established by the Organization for Economic and Cooperative Development (OECD) Council in 1972 whose recommendation was adopted by the OECD Council in 1974. The Polluter-Pays Principle means that the polluter should bear the expenses of carrying out the measures, as specified in the previous paragraph, to ensure that the environment is in an acceptable state, that is, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption (OECD, 1972). It can be described as a way of attributing responsibility for the pollution upon the polluter. That is, whoever spills rubbish on the street must be responsible for cleaning it. Since then, it has been an internationally recognized principle meant to prevent and control pollution by attributing liabilities to those responsible for the pollution. The logic of the PPP is that it holds the party that causes pollution which is harmful to the environment and human health whether it is an individual, a company, a group, public or private responsible for the actions (Saab, 2022). PPP is meant to preserve the earth so that it can be a comfortable place for humans and other living organisms and as a means of upholding the accountability on actions of contributing pollutants to the atmosphere thus taking responsibilities as ecological citizens (Soge, 2019). Accordingly, ECA (2021) observed that pollution represents a significant cost for society and is a key concern for Europeans Union

citizens but by applying the Polluter Pays Principle (PPP), polluters are incentivized to avoid environmental damage and are held responsible for the pollution that they cause. Thus countries all over the globe have shown concerns on global climate change by establishing common guiding principles to combat climate change in the form of adaptation and requiring actors to cut back their polluting activities and fossil fuels consumption (Soge, 2019). Initially in 1972, PPP focus was only on pollution prevention and control costs measurements, but it was later expanded to include the costs of administrative measures and was expanded further to cover environmental liability.

Empirical Studies

Majekobaje (2024) investigated the relationship between environmental liability and financial performance of listed oil and gas companies in Nigeria. The findings of the study showed that using the dimensions of Compensation obligation and profitability, and the dimensions of Remediation Obligation and Market Value, Environmental liability has a positive and significant relationship with financial performance of oil and gas companies in Nigeria. While environmental liability dimension of Remediation has no significant relationship with profitability of oil and gas firms in Nigeria

Akpan, Akinninyi and Inwang (2024) examined the effect of environmental disclosure on cost of equity of listed consumer goods firms in Nigeria. Ex-post facto research design was adopted, and panel data covering ten (10) years (2013-2022) were collected across eighteen (18) listed consumer goods firms in Nigeria which formed the sample size of the study. The data collected were analysed using panel multiple regression analysis via E-views 10.0 statistical package. The study findings revealed that environmental risk disclosure (Coeff. = -0.0269{0.0107}) and waste management disclosure (Coeff. = 0.0178{0.0009}) have significant negative relationships on cost of equity (COE) of listed consumer goods firms in Nigeria while greenhouse gas emission disclosure (GGED) has an insignificant negative effect (Coeff. = -0.0075{0.3966}) on cost of equity (COE) of listed consumer goods firms in Nigeria.

Damieibi (2023) reviewed the environmental accounting practices and net profit of listed oil and gas companies in Nigeria. Dimensions used for environmental accounting included pollution, waste management and drainage costs. The stakeholder theory was used in the research. The study used secondary data collected from the audited financial statements of ten (10) oil and gas companies listed on the Nigerian stock exchange between 2012 and 2021.

The data were analyzed by least squares regression using SPSS version 22.0. The results indicated that there is a positive, significant relationship between pollution cost accounting and net profit, while a negative, significant relationship was observed between drainage cost accounting and net profit. There is no statistically significant relationship between the accounting of waste management costs and net profit. It has been concluded that environmental accounting practices affect the net profit margin of Quoted oil and gas companies in Nigeria. The study recommended that adequate attention be paid to waste management accounting by the management of oil and gas companies in Nigeria in other areas as well to improve profitability.

Ubokudom, Akpan and Akinninyi (2024) examined the effect of environmental remediation costs on financial performance of listed oil and gas companies in Nigeria from 2013-2022. Specifically, the study examined the effect of waste management costs, environmental cleanup costs and environmental safety costs on return on assets of these companies. The research design adopted for this study was expost facto and secondary data used were obtained from the annual reports of ten (10) listed oil and gas companies in Nigeria. The ordinary least square regression technique was used to analyze the data and the statistical package employed was E-views version 10. The results of the analysis showed that waste management costs have insignificant negative effect on return on assets; environmental cleanup costs and environmental safety costs have significant positive effect on return on assets of the companies under study. Therefore, it was concluded that environmental remediation costs can in the long run enhance the profitability of listed oil and gas companies in Nigeria. Based on this, it was recommended among others that management of oil and gas companies in Nigeria should invest in innovative waste management practices to remediate and restore the environment as this can benefit the company in the long run. Also that the management of oil and gas companies in Nigeria should develop comprehensive contingency plans and set aside reserves specifically earmarked for environmental cleanup activities to ensure prompt and effective response to any incidence of environmental emergencies.

Shiyghan, Mukah and Vukenkeng (2024) evaluated the effect of Environmental Cost Accounting on the return on assets of manufacturing firms in the Douala Industrial Zone Cameroun. Data was collected through a descriptive survey and a questionnaire using a sample size of 128. The study adopted a descriptive statistic and ordered logit model to do the data analysis. The results showed a positive relationship between employee health and safety compliance cost, and pollution prevention cost. It therefore recommended the application of

environmental prevention policies, in order to reduce resource spending on restoration and environmentally friendly product production.

Alpheaus and Nwankwo (2023) investigated the effect of environmental cost disclosure on the financial performance of 12 listed manufacturing firms in Nigeria from 2013 to 2022. Expost facto research design was adopted and secondary data were sourced from their annual reports of the sampled manufacturing firms listed on the Nigerian Exchange Group as at 31st December, 2022. Results on the assessment of the effect of independent variables (Pollution control cost (PCC), Waste management cost (WMC) and Employee health and safety cost (EHSC) on dependent variable (Earnings per share (EPS) were analyzed with the use of the statistics, correlation analysis, Panel Generalized Method of Moments as well as Arellono-Bond Serial Correlation test. The outcome of the analysis revealed that Pollution control cost effect on earnings per share of listed manufacturing firms in Nigeria is negative but significant. However, the effect of Waste management cost and Employee health and safety cost on earnings per share of listed manufacturing firms in Nigeria is positive and significant. The study concluded that environmental cost disclosure has significant effect on the financial performance of listed manufacturing firms in Nigeria. The study recommended that Manufacturing firms should invest in environmental training, donations and charity, waste management and remain socially responsible to the host communities to ensure smooth and uninterrupted operations.

Ibeanu, Okwo and Nkwagu (2023) determined the impact of environmental cost on corporate performance of selected oil firms in Nigeria with emphasis on determining the extent to which environmental remediation and pollution control cost, environmental law compliance and penalty cost, and employee health and safety cost affect corporate performance. The result of the analysis showed that environmental remediation and pollution control cost has a significant and positive effect on return on assets of the sample d oil and gas firms in Nigeria.

Enekwe, Ugwudioha, and Uyagu (2023) examined the effect of environmental costs on the financial performance of listed oil and gas companies for a ten-year period from 2010 to 2019 in Nigeria. Data collected on staff development cost, community development costs and employee health and safety costs were analyzed using panel Ordinary Least Square. The findings revealed that staff development costs have a negative but insignificant effect on listed Nigerian oil and gas companies' return on assets, while community development costs and employee health and safety costs have a positive but insignificant effect.

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METHODOLOGY

Ex-post facto research design was adopted in this study to determine the effect of eco cost management on the financial performance of listed consumer goods firms. Also the study used content analysis methodology by using Global Reporting Initiative (GRI) guidelines that was provided in Appendix 11. This study covered all the Consumer goods firms listed in Nigerian Exchange group as at 31st December, 2023. The population of the study comprised of Twenty-one (21) Consumer Goods Firms listed in Nigeria Exchange Group (NGX Fact book)) as of December 31, 2023. They are provided in appendix 1. From the population above, sixteen (16) Consumer-Goods Firms were selected because they were consistently listed and actively trading on the floor of Nigeria Exchange Group from January 1, 2012 to December 31, 2023. This study relied on secondary data obtained from various sources.

The Independent variables for the study are Employee Health and Safety Disclosure (EHSD), Pollution Control Disclosure (PCD) and Environmental Remediation Disclosure (ERD) as proxies eco-Cost Management and for the dependent variable financial Performance proxied by Return on Capital Employed (ROCE). Data for the period of twelve years from 2012 to 2023 were collected from audited annual report and account of the sampled firms. Variable, measurement and definition are in Appendix III. This study adapts the model by Lawrence and Bernard (2023) that studied Environmental Costs and Financial Performance of Selected Industrial Goods Firms in Nigeria. The model is estimated as follows to achieve the objectives of the study:

$ROCE_{it} = \alpha_{it} + \beta_1 EHSD_{it} + \beta_2 PCD_{it} + \beta_3 ERD_{it} + \epsilon$ _____Eqn 2

Where:

ROCE: Return on Capital Employed

EHSD: Employee Health and Safety Disclosure.

PCD: Pollution Control Disclosure.

ERD: Environmental Remediation Disclosure.

α: Intercept of the model.

$\beta 1, \beta 2, \beta 3$: Coefficients for each independent variable

ϵ: Error term representing unexplained variance.

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RESULT AND DISCUSSIONS

This section presents the results of the analysis of the collected data from the annual report and accounts of the sampled firms in Nigeria. The descriptive statistics and regression analysis are presented below:

Table 1 Result of Descriptive Analysis

	ROCE	EHSD	PCD	ERD
Mean	0.162333	0.485677	0.192708	0.255208
Median	0.146217	0.500000	0.000000	0.000000
Maximum	1.333687	0.750000	0.500000	0.750000
Minimum	-1.366108	0.250000	0.000000	0.000000
Std. Dev.	0.297742	0.133384	0.233007	0.325567
Skewness	-0.617869	-0.055961	0.469272	0.717221
Kurtosis	9.201584	3.478525	1.321946	1.709174
Jarque-Bera	319.8935	1.932099	29.57385	29.79084
Probability	0.000000	0.380584	0.000000	0.000000
Sum	31.16794	93.25000	37.00000	49.00000
Sum Sq. Dev.	16.93218	3.398112	10.36979	20.24479
Observations	192	192	192	192

Source: Eviews 10 Output

Table 1 shows the results of descriptive statistics, the number of observations for the sampled 16 listed consumer goods firm stand at 192. The Return on Capital Employed (ROCE), with an average value of 0.162, suggests moderate capital efficiency among the sampled firms. The maximum ROCE of 1.334 implies that some firms exhibit high capital efficiency, while the minimum of -1.366 reveals instances of negative returns, indicating possible capital losses in certain cases. The standard deviation of 0.298 reflects variability in capital employed returns across firms, and skewness at -0.618, coupled with a kurtosis of 9.202, implies that ROCE has a left-skewed distribution with a higher peak, indicating some firms experience extreme negative ROCE values. The Jarque-Bera probability of 0.000 indicates non-normality in the ROCE data distribution.

Secondly, EHSD has an average score of 0.486, showing that firms engage in employee health and safety disclosures, albeit moderately. The maximum value of 0.750 indicates high disclosures for some firms, while a minimum of 0.250 shows that some firms have minimal disclosure practices. With a low standard deviation of 0.133, EHSD disclosures are relatively consistent across firms. Skewness at -0.056 suggests a roughly symmetrical distribution, while kurtosis at 3.479 reflects a distribution close to normal. The Jarque-Bera probability of 0.380 suggests that EHSD data distribution does not significantly deviate from normality.

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Thirdly, The average PCD score is 0.193, indicating minimal pollution control disclosures across firms. With a maximum value of 0.500 and a minimum of 0.000, some firms disclose minimal to no pollution control measures. The standard deviation of 0.233 implies low variability among firms in pollution control disclosures. A right-skewed distribution (skewness 0.469) suggests that many firms tend to have lower disclosures, and the kurtosis of 1.322 shows a flatter-than-normal distribution. A Jarque-Bera probability of 0.000 suggests a significant deviation from normality.

Lastly, Environmental Remediation Disclosure (ERD), The mean ERD score of 0.255 reflects a generally low level of environmental remediation disclosure among the firms. A maximum value of 0.750 shows some firms disclose robust remediation efforts, while a minimum of 0.000 indicates no disclosure for some firms. The standard deviation of 0.326 suggests moderate variation across firms in ERD practices. A skewness of 0.717 indicates slight right-skewness, where firms tend to have lower remediation disclosure levels. Kurtosis at 1.709 shows a flatter-than-normal distribution, and the Jarque-Bera probability of 0.000 indicates significant non-normality in ERD distribution.

Heteroskedasticity Test

The Heteroskedasticity Test using the Breusch-Pagan-Godfrey method evaluates whether the error variance in the regression model is constant across observations, which is a critical assumption in linear regression. A lack of heteroskedasticity (constant variance) indicates that the variability in the data is stable, meaning the model's predictions are reliable across different levels of the independent variables.

Table 2
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.778535	Prob. F(5,186)	0.5663
Obs*R-squared	3.935873	Prob. Chi-Square(5)	0.5587
Scaled explained SS	18.90246	Prob. Chi-Square(5)	0.0020

Source: Eviews 10 Output

In this analysis shown in Table 2, the p-value for the F-statistic is 0.5663, which is greater than the typical significance threshold of 0.05. This result implies that there is no significant heteroskedasticity in the model, suggesting that the variance of the errors is constant and that the model meets the assumption of homoskedasticity. With homoskedasticity confirmed, the regression estimates are likely unbiased and efficient, meaning that the interpretation of the relationships between eco-cost management practices (EHSD, PCD, ERD) can be considered

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reliable. The absence of heteroskedasticity strengthens the model's validity, indicating that the effects of the eco-cost management disclosures on ROCE are consistent and unaffected by unequal variance, thus enhancing the robustness of the study's findings on the financial performance of consumer goods firms in Nigeria.

The estimates from the Robust Least Square regression was used to test the hypotheses of the study, as shown below in Table 3.

Table 3: Regression Results for Hypotheses Testing

Dependent Variable: ROCE
Method: Robust Least Squares
Date: 10/21/24 Time: 17:42
Sample: 2012 2023
Included observations: 192
Method: M-estimation
M settings: weight=Fair, tuning=1.4, scale=MAD (median centered)
Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EHSD	-0.275477	0.009187	-29.98454	0.0000
PCD	-0.624761	0.015374	-40.63879	0.0000
ERD	-0.141239	0.009746	-14.49241	0.0000
C	0.225969	0.003014	74.97762	0.0000
	Robust Statistics			
R-squared	0.614975	Adjust R-squared		0.514975
Scale	0.792632	Rn-squared statistic		9511.992
Prob(Rn-squared stat.)	0.000000			

Source: Eviews 10 Output

The study's findings based on the robust least squares regression reveal how eco-cost management disclosures impact the financial performance of consumer goods firms, as measured by Return on Capital Employed (ROCE). With an R-squared value of 0.614975, the model explains approximately 61.5% of the variance in ROCE, indicating that eco-cost management variables significantly influence financial performance. The probability of the R-squared statistic, Prob(Rn-squared stat.) = 0.000000, indicates that the overall regression model is statistically significant at the 5% level ($p < 0.05$). This suggests a strong likelihood that the relationship observed between the eco-cost management disclosures and financial performance (ROCE) is not due to chance. Consequently, the model is robust, meaning that eco-cost management variables collectively have a significant effect on the financial performance of consumer goods firms.

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This highly significant Prob(Rn-squared stat.) value reinforces the model's validity, confirming that the eco-cost management disclosures— Employee Health and Safety Disclosure (EHSD), Pollution Control Disclosure (PCD), and Environmental Remediation Disclosure (ERD)play a crucial role in explaining variations in Return on Capital Employed (ROCE) across the sampled firms. Thus, this finding underlines the importance of eco-cost management practices in influencing financial outcomes in the consumer goods sector.

Test of Hypotheses

Hypothesis One

H_{o1}: Employee health and safety disclosure has no significant effect on return on capital employed (ROCE) of consumer goods firms in Nigeria.

H_{i1}: Employee health and safety disclosure significantly affects return on capital employed (ROCE) of consumer goods firms in Nigeria.

The analysis output of Table 3 reveals that Employee Health and Safety Disclosure (EHSD) has a negative coefficient of -0.275477, indicating a marginally negative effect on ROCE. A unit increase in EHSD leads to a reduction in ROCE by 0.275, and this effect is statistically significant (p-value = 0.0000). This result suggests that increased disclosure on health and safety may incur costs that reduce capital returns, possibly due to higher investments in employee safety and health resources. The alternate hypothesis was accepted since the p-value is less than 0.05. Thus, Employee Health and Safety Disclosure (EHSD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.275, p = 0.0000).

Hypothesis Two

H_{o2}: Pollution control disclosure has no significant effect on the return on capital employed (ROCE) of consumer goods firms in Nigeria.

H_{i2}: Pollution control disclosure has significant effect on the return on capital employed (ROCE) of consumer goods firms in Nigeria.

Table 3 indicates that the coefficient for Pollution Control Disclosure (PCD) is -0.624761, showing a significant negative effect on ROCE. Each additional unit of pollution control disclosure is associated with a decrease in ROCE by 0.625, and this effect is statistically significant with a p-value of 0.0000. This result implies that while pollution control efforts are critical for environmental stewardship, they may impose financial costs that detract from short-term returns on capital. The alternate hypothesis was accepted since the p-value is less

than 0.05. Thus, Pollution Control Disclosure (PCD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.625, p = 0.0000).

Hypothesis Three

H_{o3}: Environmental remediation disclosure has no significant effect on return on capital employed (ROCE) of consumer Goods firms in Nigeria.

H_{i3}: Environmental remediation disclosure significantly affects return on capital employed (ROCE) of consumer Goods firms in Nigeria.

The analysis outcome on Table 3 shows that Environmental Remediation Disclosure (ERD) has a negative coefficient (-0.141239), meaning that as ERD increases by one unit, ROCE is expected to decrease by 0.141. This effect is statistically significant (p-value = 0.0000), suggesting that while environmental remediation is essential for sustainable operations, it may come at a cost to immediate capital efficiency due to the expenses involved in remediation efforts. The alternate hypothesis was accepted since the p-value is less than 0.05. Thus, Environmental Remediation Disclosure (ERD) has a significant but negative effect on return on capital employed of listed consumer goods firms in Nigeria (β = -0.141, p = 0.0000).

CONCLUSION AND RECOMMENDATIONS

The negative effects observed in Employee Health and Safety Disclosure (EHSD), Pollution Control Disclosure (PCD), and Environmental Remediation Disclosure (ERD) on ROCE highlight the financial challenges firms may face when attempting to comply with stringent environmental regulations and safety standards. This suggests that while these disclosures are essential for corporate governance and ethical compliance, they may require substantial investment and resources that could detract from immediate financial returns.

Based on the conclusion of this study, the following measures are recommended:

1. Human Resources (HR) departments should prioritize the enhancement of employee health and safety measures. This involves conducting regular assessments and implementing necessary improvements to ensure compliance with health and safety regulations, thereby minimizing potential negative impacts on financial performance.
2. Environmental Compliance Officers should develop and implement comprehensive pollution control strategies that not only meet regulatory requirements but also incorporate best practices in environmental management. This includes investing in cleaner technologies and processes that can improve both compliance and operational efficiency.

3. Environmental Managers should conduct a thorough assessment of existing environmental remediation practices and ensure that they are aligned with the company's financial goals. This may involve developing a strategic plan that balances remediation efforts with cost efficiency, thereby minimizing any adverse financial impacts.

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