

Green Accounting and Financial Performance of Listed Oil and Gas Companies in Nigeria

Dan Patrick B. S

(Department of Accounting, Federal university, Birnin Kebbi)

Dr. Adebimpe O. Umoren

(Accounting Department, University of Uyo)

Dr. Eno G. Ukpong

(Akwa Ibom State University, Obio Akpa)

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Abstract

The effect of green accounting on the financial performance of Nigerian listed oil companies was examined in this study using an experimental research design, ex-post facto data extracted from the Nigerian Exchange Group and the annual published financial statement of Nigerian oil companies, a sample size of eight, and a time span of ten (10) years from 2014 to 2023. The study employed unit root testing and descriptive statistics, and it used Panel data regression for the test of hypothesis with the help of E-view statistical software version 9. The study's independent variable is green accounting, as measured by the costs of environmental sustainability, waste management, and environmental cleanup, while the dependent variable is financial performance, as measured by return on capital employed, earnings per share (EPS), and net profit margin (NPM). The study's conclusions showed that there is no substantial correlation between the costs of environmental sustainability, environmental cleanup, and waste management and return on capital invested, earnings per share, and net profit margin. The study came to the conclusion that green accounting influences the financial performance of Nigerian listed oil companies. It suggested that quoted oil and gas companies increase the amount of economic activity related to the environment and disclose this in their annual reports in order to improve their financial performance and long-term corporate sustainability when making investment decisions. Additionally, the government and authorities must to firmly enforce the disclosure of green accounting in oil corporations' annual reports.

Introduction

Climate change and global warming have prompted requests for environmental impact assessments, which in turn have put pressure on businesses to examine the environmental impact of their operations. The actions of businesses like manufacturing, oil and gas industries that generate carbon monoxide, environmental waste, and crude oil drilling have been connected to climate change since they have degraded the environment. These businesses simply care about making money; they are not aware of how their operations affect the environment and the way of life in the areas where they operate.

However, the operations of oil firms and other industrial and technology companies are contributing to an increase in environmental deterioration. Emissions, pollution, and environmental degradation are some of these negative consequences of the operations. Multinational corporations continuously search and exploit natural resources like natural gas and crude oil, which contributes to environmental damage and global warming. Nigerians are not familiar with the concept of green accounting, which could be due to a lack of knowledge about its advantages. Therefore, it is not required for listed firms to provide a green account in their annual reports. Since no accounting standard has been developed in Nigeria, there is no uniformity in the reporting of environmental issues; instead, several organisations have published guidelines, such as the Regulation enforcement agency Act of 2007. These recommendations were merely suggestions and are not required, (Okafor, 2018).

Consequently, there are no obligatory environmental accounting practices or environmental disclosure rules, for Nigerian corporations to make these disclosures. This implies that no mandatory requirement for quantitative or qualitative disclosures of environmental accounting information in annual reports exists neither is there any mandatory requirement under the Companies and allied matters Act (CAMA 1990) nor as per International Accounting Standards (IAS's) or International financial reporting standards (IFRS). Nigerian companies are not required to provide environmental accounting information when listing on the Stock exchange; however the Nigerian exchange group did recommend it in its most recent guideline (2018), on sustainability reporting. As a result, environmental accounting reporting is optional in Nigeria, which discourages environmental cost disclosure. **Statement of the Problem**

A careful examination of the annual reports has shown that the oil industry's production costs are increasing, which has also had a detrimental impact on the companies' profitability. According to Olushola (2020), the harsh investment environment, production disruptions, and militancy have all had a persistent impact on the operations of oil and gas companies. These factors, along with increased operational expenses like the various levies paid to various agencies that regulate the industry, are responsible for the rising cost of production.

Due to militancy and pipeline vandalism, the financial performance of some listed oil companies has been erratic for a number of years. This is because the host communities do not agree with the destruction of their ecosystem, which has been squandered, which has a multiplier effect on their livelihood and economic activities. Since their host towns are now putting pressure on them to clean up the contaminated environment, some oil corporations have shut down, while others are fighting for survival. For instance, Shell BP has experienced numerous instances of catastrophic damage to its oil reserves and pipelines, as well as other cruel attacks

against its employees. According to Adediran and Alade's (2013), research, there is a substantial inverse association between profitability and green accounting. Green accounting disclosures and business profitability have been found to positively correlate in several studies (Ogoun and Ekpulu, 2020; Menike 2020). However, other research has shown that there is a mixed or negative relationship between green accounting and an entity's financial success (Azzam, et al., 2020). Thus, findings from these studies revealed different results which could partly be attributed to different statistical test techniques employed by the researchers. These conflicting and ambiguous results motivated the researcher to carry out this investigation in order to contribute to the body of knowledge already in existence and to sincerely comprehend the impact of green accounting on the financial performance of Nigerian listed oil and gas companies.

Literature Review

Concept of Green Accounting

One type of accounting is environmental accounting, sometimes referred to as "green accounting" or environmental management accounting. According to Iyyanki and Valli (2017), green accounting was a change made to the National Accounts system that takes into account the cost of replenishing natural resources that have been depleted. According to Weng, Chen, and Chen (2015), environmental accounting, sometimes known as "green accounting," quantified (economically) how well businesses identify, measure, and report environmental-specific expenses including liability and waste disposal. It is the accounting for any expense or gain resulting from changes made to a company's process or product that will also have an effect on the environment.

Consequently, the disclosure of both financial and non-financial data regarding a company's environmental footprint or impact during an accounting period is known as environmental accounting, according to the ACCA (2015). According to Gatimbu and Wabwire (2016), "going green" helps reduce pollution and environmental degradation, maintain and service equipment, maintain oil pipelines, and more. This environmental disclosure detailed the costs incurred by the company, including waste management, recycling, repackaging, energy and resource conservation, carbon management, emission reduction, pollution control, and the preservation of wetlands on the natural environment. Degradation and contamination of the air and water, hazardous waste discharge, depletion of natural and non-renewable resources, deforestation, and other losses are caused by business operations. Green accounting assists in computation of income for a nation by considering the costs of economic damage and depletion of the natural resource base of an economy.

Financial Performance

Financial performance, according to Dwivedi (2002), was a subjective indicator of how well a business uses its resources to produce revenue. He added that businesses in the same sector can evaluate one other's performance. Three factors could be used to evaluate a company's financial performance, according to Wang, Lu, Ye, et al., (2016): the company's productivity, profitability, and market value. Profit maximisation is the primary concern of enterprises, according to Rahman, Zain, and Yahaya (2011). Hassan, et al., (2021) contend that a company's ability to generate returns on investment in its assets with a positive net present value is what constitutes its performance. A company's financial performance metrics, according to Iliemena and Okolocha (2010), showed its

financial health over time. The efficacy and efficiency with which a company uses its assets to produce income over a specific time period is measured by its financial performance.

Hypotheses development

Theoretical Review

Stakeholder Theory

This study is anchored on the "stakeholders' theory," which maintains that companies should take into account the interests of other stakeholders, like the operating environment and society, while pursuing their primary objective of profitability. In order to ascertain how green accounting disclosure impacts the financial performance of oil and gas companies, as well as to investigate the impact of environmental degradation by these companies on stakeholders, the stakeholder theory was implemented. Stakeholders in business operations must be taken into account in order to support the adoption of green accounting. These include the issues raised by the host communities where the businesses operate, the clients they serve, the competence of suppliers, governmental rules, and the organizational, technological, and environmental factors that influence green accounting.

According to Freeman, stakeholders can be classified as either internal (consumers, suppliers, and employees) or external (competitors and the government). In order to respond to stakeholder pressure, companies must take into account the demands of multiple stakeholder groups. The stakeholder theory has been adopted for several environmental studies, such that stakeholders have been instrumental in influencing both corporate ecological responsiveness; Bansal, and Roth, (2000) and environmental strategies. Studies have shown that there is a positive relationship between green accounting disclosures and business profitability (Ogoun and Ekpulu, 2020; Menike, 2020). Stakeholders' impact on environmental management has fluctuated, though, and the outcomes have been uneven. For instance, Azzam and Alqudah (2020), suggested that there was a mixed or negative relationship between green accounting and a company's financial performance, while Ogoun and Ekpulu (2020) and Menike (2020), discovered a favourable relationship between environmental disclosure and firm's performance. The stakeholder theory is credited to "Dr. Edward Freeman" the father of stakeholder's theory. He taught at the University of Virginia as a professor. He pointed out in his book "Strategic Management: A Stakeholders' Approach" that a corporation has many stakeholders, of which shareholders are only one. According to his definition, a stakeholder is any individual who can both influence and be impacted by a company's operations. According to Darnall, et al., (2010), a new business model had emerged that recognizes and takes into account the conflicting needs of the various stakeholders by creating business policies and strategies that were beneficial to all. Those in charge of affairs must incorporate the welfare of various stakeholders by strategizing on maximizing value, which is why there is pressure from the various stakeholders to disclose social and environmental information.

Agency theory

Jensen and Meckling created the notion of agency theory in 1976. This idea provided support for the existence of a contract in which one or more parties (the principals) hire an agent to carry out certain tasks on their behalf, so giving the agent some degree of decision-making authority. However, a conflict of interest between the principal and the agent or between the investors and management might give rise to agency issues. It could be concluded from this, that

managers are motivated to make self-serving choices that "misuse" the money that investors had placed in a company because they invested their money in it and frequently do not actively managed it.

This might be related to significant decisions like improper or inadequate green accounting or disclosures of the firms' carbon footprint, which might have an impact on the firm's value over time. On the other hand, it might benefit the company when adequate disclosures were made publicly regarding the amount or volume of greenhouse gases emitted, in accordance with the interests of investors, shareholders, and other stakeholders (Healy and Palepu 2001). This suggests that public reporting of environmental matters not only would reduce the potential agency problems but might also have an impact on the firm value over time. This possibility is enunciated in a cardinal principal-agent relationship defined by agency theory, which makes this theory relevant to this study.

Empirical Review

Odum and Arinomor (2023), examined the effect of green accounting cost on return on equity, shareholders' funds, earnings per share, profit after tax, and net profit margin of selected oil and gas companies. The study covered thirteen (13) years from 2020 to 2022. The researchers employed an ex-post facto research design with the aid of the Panel ordinary least square (POLS) and Granger causality techniques to analyze the data. The result of the Granger causality test revealed that green accounting cost has no significant effect on the return on equity, shareholders' funds, earnings per share, and net profit margin of oil and gas companies. Given the findings, the researchers suggested that the management of oil and gas companies in Nigeria should develop a well-articulated environmental costing system to guarantee a conflict-free corporate atmosphere for improved return on equity.

Akpan and Nkanta (2023), investigated the effect of green accounting practices on shareholders' value in Nigeria by drawing samples from listed consumer goods firms in the Nigerian Exchange Group. The study's chronological scope was from 2012 to 2021. Ex post facto design was used, secondary data were employed and least square dummy variable regression was used in analyzing the data. A sample size of 20 companies was determined using the Taro Yamane formula and these companies were selected using the simple random sampling technique. Green accounting was indicated in the study by biodiversity disclosure, emission disclosure, waste disclosure, water and effluents disclosure, and compliance to environmental laws & regulations disclosure while shareholders' value proxied by shareholders' value added (SHVA). The result showed that biodiversity disclosure and compliance to environmental laws disclosures had a positive significant effect on shareholders' value added; water and effluents disclosures have a positive significant effect on shareholders' value added of listed consumer goods firms in Nigeria during the period under study. The researchers concluded that green accounting practices have a significant effect on shareholders' value added to manufacturing companies in Nigeria. Therefore, the researchers recommended that green accounting practices should be made mandatory for all companies because standard green accounting disclosures are signals to all stakeholders that the companies are 'green' and eco-friendly companies, and this, in turn, boosts shareholders' value.

Ho1: There is no significant effect of environmental sustainability cost on return on capital employed (ROCE) of oil and gas companies in Nigeria is not significant

Environmental sustainability

Chude, et al., (2022), investigated the effect of green accounting practices on the returns on assets and returns on equity of consumer goods manufacturing firms in Nigeria. The stakeholder theory was the theoretical underpinning of the research. The study adopted an ex post facto research design, and the final sample comprised twenty-one consumer goods companies quoted on the Nigerian exchange group. The researchers relied on secondary sources of data from the annual financial reports of these companies from 2011 to 2017. The data were analyzed using least squares regression. The findings of the study revealed that green accounting practices have a positive and significant relationship with returns on assets but a negative effect on returns on equity that is not significant. The researchers recommended that green accounting practices should be part of the corporate practices of manufacturing firms because they improve return on assets and improve stakeholder engagement.

Okoli, et al., (2021), examined the impact of green accounting on firm performance in Nigeria. Tobin Q was used to measure the firm value. The study selected 72 manufacturing firms listed on the Nigerian Stock Exchange that disclosed green accounting information in line with GRI-4. Ex-post facto research design was used and secondary data were collected from annual reports of sampled firms from 2012- 2019. The data were analyzed with descriptive statistics and correlation analysis while pooled ordinary least squares regression was employed to test formulated hypotheses. From the analysis, it was found that material and energy disclosure have positive and significant effects on firm performance. Based on these findings, the researchers recommended that companies should develop policies concerning materials used to produce and Package the Company's primary products and services during the reporting period and firms should also make their operations more sustainable by reporting on their energy consumption and energy efficiency policy being aware of it's in becoming accountable and responsible

Budiono and Dura (2021), examined the application of green accounting and its impact on company profitability. In this study, green accounting was measured by the Company Performance rating program in environmental management (PROPER) and profitability was measured with the return on asset (ROA). The research method used was quantitative research design. The sample size of 24 out of the population of 100 Kompas Index companies was selected purposely. Data were analyzed using simple regression. The results of this study indicated that the application of green accounting has a significant effect on the profitability of the Kompas100 Index Company.

Amosun and Akintoye (2021), examined the impact of green accounting on the financial performance of companies in Nigeria. This study was based on the data extracted from the annual reports of two natural resources companies listed on the Nigerian exchange group for five years (2015- 2019). The data was analyzed using ordinary least squares (OLS) regression. The findings in the study showed that environmental accounting (environmental conservation cost) has a significant effect on the financial performance of natural resources companies. The authors concluded that proper reporting of green accounting could affect the financial performance of companies.

Benson, et al., (2021), examined the effect of green accounting on the financial performance of oil and gas companies from 2010-2020. A quantitative technique was adopted, and an ex post facto research design was employed for the study. Data were obtained from annual reports and accounts of the companies for the periods 2010 to 2020. The results showed that environmental cost accounting has a significant effect on the financial performance of oil and gas companies. Also, the results from the analysis showed that green management accounting has a significant effect on the financial performance of oil and gas firms. Therefore, the researchers recommended that the management of oil and gas companies in Nigeria should pay particular attention to environmental cost accounting to enhance the firm's operating environment and the financial performance of the companies.

Ho2: There is no significant effect of waste management cost on return on capital employed of oil and gas companies in Nigeria.

Effect of waste management cost on return on capital employed

Sumiati, et al., (2021), investigated empirical evidence about the effect of green accounting and environmental performance on profitability, either separately or concurrently. The population in this study consisted of 107 companies listed on the Indonesia Stock Exchange in the mining sector and the consumption goods industry sector. Purposive sampling with criteria sets to produce 77 observational data was used to sample as much as possible. Based on the findings, the researchers concluded that, while the use of green accounting is voluntary, its impact on profitability is greater than that on environmental performance.

Lusiana, et al., (2021), examined the relationship between green accounting, corporate social responsibility (CSR), return on asset, return on equity, and firm value. A total of 30 peer-reviewed articles were reviewed and analyzed, resulting in a finding in the previous article's literature. The researchers found that green accounting and CSR significantly affect financial performance, hence impacting firm value. The researchers concluded that the application of green accounting affects increasing profits. According to researchers, a company with a good CSR will certainly create a positive image and reputation among investors.

Eze (2021), examined green accounting disclosure and its effect on the financial performance of listed manufacturing firms in Nigeria. In particular, the study examined the effect of green accounting disclosure on ROA, ROE, and share price of manufacturing firms in Nigeria. The ex-post facto research design was employed. Data was collected from the annual reports of forty out of the sixty-six manufacturing companies listed in the Nigerian Stock Exchange as of 31st December 2019 for the period spanning 2010 – 2019. The descriptive statistics and the panel regression methods were employed for the data analysis. The Arellano and Bond (1991) GMM estimator which controls for potential endogeneity problems was employed to ensure the robustness of the parameter. The study findings revealed that green accounting disclosure had a positive significant effect on ROA and ROE. However, a negative effect was found to exist between green accounting disclosure and the share price of manufacturing firms in Nigeria. The researchers recommended that manufacturing firms be encouraged to increase the extent of their green accounting activities for ease of assessment by stakeholders for investment decision-making.

Ho3: There is no significant effect of environmental clean-up cost on return on capital employed of oil and gas companies Nigeria

Environmental clean-up cost on return on capital

Ogoun and Ekpulu (2020), investigated how environmental reporting by firms operating within the manufacturing sector in Nigeria affects their operational performance. The researchers employed the panel research design and the Hausman test to select the appropriate model for the ten-year study, covering 2009 to 2018. The result showed the existence of a positive effect between environmental reporting and firms' operational or financial performance. Solomon (2020) carried out a literature review on the ecological disclosure and financial performance of listed oil and gas companies in Nigeria. Performance was proxied by return on asset, return on equity, earnings per share, cash flow, and profit margin. The findings revealed a mixed outcome of a negative and positive relationship between the variables in the study.

Yang and Yi Li (2020), carried out a study on the impact of environmental information disclosure on the firm value of listed manufacturing firms in China between 2006 and 2016. The data set was analyzed using the difference-in-differences (DID) model and the propensity score matching method (PSM) and the result showed that the Environmental Information Disclosure Measure for Trial Implementation (EIDMT) exerts a significant impact on the listed manufacturing firms' value.

Methodology

This research evaluated the relationship between green accounting and financial performance hence experimental research design using Ex-post-facto data was adopted for the study because of the nature of the data required and also data relating to both variables in this study already existed in the literature (Madugba, Ben-caleb, Lawal and Agburuga 2020) and the researcher cannot manipulate the variables as there is no control over the variables hence a causal relationship can be ascertained between green accounting and financial performance.

The population of this study comprised quoted oil and gas companies in Nigerian Exchange Group. Eight (8) oil and gas companies whose shares are actively quoted on the floors of Nigerian Exchange Group (NGX Group) were selected. This study investigated the effect of green accounting on financial performance of oil and gas companies in Nigeria which covered a period of ten years from 2014 – 2023.

This study made use of secondary data which were generated from the financial statement of the selected oil and gas companies in Nigeria covering a period of ten years for the eight companies from 2014- 2023 making eighty firms' years.

This study employed Panel data regression analytical tool. This statistical tool was adopted because of the number of Oil and Gas firms and the period of time involved. The data generated from the financial statement of the oil and gas companies in this study was subjected to the panel data regression and the Hausman test to select the appropriate model for the ten years covering 2014-2023.

Hypotheses testing, results and discussion of finding

This section presents the data collected for the study, the analysis of the data using various statistical tools stated in the preceding chapter, the testing of the research hypotheses, and the discussion of findings based on the results interpreted.

Data Analyses

This study used panel data regression, which included both fixed and random effects. The Hausman test was used to determine which of the fixed and random effects should be used for interpretation. There is no significant relationship between the return on capital employed by Nigerian listed oil companies and the costs of environmental sustainability, waste management, and environmental cleanup. Decision rule: Reject null hypothesis if probability value computed by means of E-view is less than or equal to 0.05 ($p \leq 0.05$)

Table 4.3.1 demonstrates the fixed effect of panel data regression on the return on capital utilised by Nigerian listed oil companies, highlighting the impact of environmental sustainability, waste management, and environmental cleanup expenses.

Variable

| | | | |
|----------|----------|----------|------|
| 1.200279 | 0.110792 | 10.83361 | 0.00 |
|----------|----------|----------|------|

| | | | | |
|------|-----------|----------|-----------|--------|
| LESC | -0.008989 | 0.017172 | -0.523461 | 0.6024 |
| LWMC | -0.009848 | 0.014093 | -0.698821 | 0.4871 |
| LECC | -0.011076 | 0.013982 | -0.792166 | 0.4311 |

| Variable | t | Std. Error | t-Statistic | Prob. |
|----------|-----------|------------|-------------|--------|
| C | 1.139829 | 0.150915 | 7.552808 | 0.0000 |
| LESC | -0.005220 | 0.024082 | -0.216751 | 0.8290 |
| LWMC | -0.010668 | 0.019789 | -0.539072 | 0.5915 |
| LECC | 0.000716 | 0.019389 | 0.036941 | 0.9706 |

Effects Specification

| | S.D. | Rho |
|----------------------|----------|--------|
| Period random | 0.000000 | 0.0000 |
| Idiosyncratic random | 0.484809 | 1.0000 |

| Coefficient | Std. Error | t-Statistic | Prob. |
|-----------------------------|------------|--------------------|----------|
| 1.200279 | 0.110792 | 10.83361 | 0.0000 |
| Weighted Statistics | | | |
| R-squared | 0.007475 | Mean dependent var | |
| 1.066530 Adjusted R-squared | -0.033314 | S.D. dependent var | 0.453410 |
| S.E. of regression | 0.460901 | Sum squared resid | 15.50737 |
| F-statistic | 0.183256 | Durbin-Watson stat | |
| 0.762207 | | | |
| Prob(F-statistic) | 0.907454 | | |

Source: Author's computation, 2025

Table 4.3.3 presents the Hausman Test

Correlated Random Effects - Hausman Test Equation: Untitled

Test period random effects

| Test Summary | Chi-Sq. | Statistic | Chi-Sq. d.f. | Prob. |
|---------------|----------|-----------|--------------|-------|
| Period random | 0.694840 | 3 | 0.8744 | |

Source Author's computation, 2025

Decision Rule: Accept random effect if the Hausman test probability is less than or equal to 0.05 According to Table 4.3.3 (the Hausman Test), the test's probability is not significant at the 5% level. Thus, we reject the null hypothesis and accept the alternative, concluding that the fixed effect model is more appropriate. This suggests that our discussion of the results will be based on the fixed effect model.

According to Table 4.3. 1 above (fixed effect model), changes in the value of the predictor variable (environmental sustainability costs, environmental clean-up costs, and waste management costs) account for approximately 46.856% of the variations in return on capital employed (ROCE) of listed oil companies in Nigeria, as indicated by the adjusted coefficient of multiple determination of 0.468557. This suggests that variables not included in our study account for roughly 53.14% of variations in return on capital employed. Further demonstrating the suitability of the model specification is the econometric value of the F-ratio of 7.700678, which is significant at the 5% level. Once more, the Durbin-Watson statistic of 1.567849, which points to the lack of auto-correlation, is around 2. Thus, the null hypothesis was rejected in this study, and it was determined that the independent factors taken together significantly affect the return on capital used by Nigerian listed oil companies.

Test of hypothesis two

The relationship between environmental sustainability cost, waste management costs, and environmental clean-up costs and earnings per share of listed oil companies in Nigeria is not significant.

Decision rule: Reject null hypothesis if probability value computed by means of SPSS is less than or equal to 0.05 ($p \leq 0.05$)

Table 4.4.1 presents the fixed effect of panel data regression showing the effect of environmental sustainability cost, waste management costs, and environmental clean-up costs on earnings per share of listed oil companies in Nigeria.

| Variable | Coefficient | | | |
|----------|-------------|------------|-------------|--------|
| | t | Std. Error | t-Statistic | Prob. |
| C | 0.564418 | 0.129277 | 4.365967 | 0.0000 |
| LESC | 0.030032 | 0.020037 | 1.498833 | 0.1387 |
| LWMC | -0.027381 | 0.016444 | -1.665108 | 0.1006 |
| LECC | -0.020737 | 0.016315 | -1.271031 | 0.2082 |

| Effects Specification | | | |
|---------------------------------------|-----------|-----------------------|----------|
| Cross-section fixed (dummy variables) | | | |
| R-squared | 0.541914 | Mean dependent var | 0.518888 |
| Adjusted R-Squared | 0.472507 | S.D. dependent var | 0.531035 |
| S.E. of regression | 0.385684 | Akaike info criterion | 1.063966 |
| Sum squared resid | 9.817638 | Schwarz criterion | 1.398796 |
| Log likelihood | -29.96271 | Hannan-Quinn criter. | 1.197895 |
| F-statistic | 7.807781 | Durbin-Watson stat | 2.256593 |
| Prob(F-statistic) | 0.000000 | | |

Source: Author's computation, 2025

Table 4.4 2 presents the random effect of panel data regression showing the effect of environmental sustainability cost, waste management costs, and environmental clean-up costs on earnings per share of listed oil companies in Nigeria

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| C | 0.610811 | 0.162691 | 3.754435 | 0.0003 |
| LESC | 0.047426 | 0.025961 | 1.826833 | 0.0718 |
| LWMC | -0.043112 | 0.021333 | -2.020874 | 0.0470 |
| LECC | -0.038217 | 0.020902 | -1.828415 | 0.0716 |

Source: Author's computation, 2025

| Effects Specification | | |
|-----------------------|----------|--------|
| | S.D. | Rho |
| Period random | 0.000000 | 0.0000 |
| Idiosyncratic random | 0.522638 | 1.0000 |

Weighted Statistics

| | | | |
|--------------------|----------|--------------------|----------|
| R-squared | 0.118882 | Mean dependent var | 0.518888 |
| Adjusted R-squared | 0.082672 | S.D. dependent var | 0.531035 |
| S.E. of regression | 0.508611 | Sum squared resid | 18.88400 |
| F-statistic | 3.283112 | Durbin-Watson stat | 1.153752 |
| Prob(F-statistic) | 0.025540 | | |

Source: Author's computation, 2025

As indicated in Table 4.4.3 (the Hausman Test) the likelihood of the test is significant at 5% level and since the null hypothesis is that the random effect model is the preferable, we accept the null hypothesis and conclude that the random effect model is better suited. This suggests that the random effect model will serve as the foundation for our discussion of the findings.

According to Table 4.4.2 above (random effect model), changes in the value of the predictor variable (environmental sustainability costs, environmental clean-up costs, and waste management costs) account for approximately 8.27% of the variations seen in Nigerian listed oil companies. This is indicated by the adjusted coefficient of multiple determination of 0.082672. This suggests that variables not included in our study account for roughly 91.73% of variations in return on capital employed. Further demonstrating the suitability of the model specification is the econometric value of the F-ratio of 3.283112, which is significant at the 5% level.

This study rejected the null hypothesis and came to the conclusion that the independent variables together have a significant impact on the earnings per share of listed oil companies in Nigeria. The Durbin-Watson statistic of 1.153752 is roughly 2 and indicates the absence of auto-correlation.

Test of hypothesis three

The relationship between environmental sustainability cost, waste management costs, and environmental clean-up costs and net profit margin of listed oil companies in Nigeria is not significant.

Decision rule: Reject null hypothesis if probability value computed by means of SPSS is less than or equal to 0.05 ($p \leq 0.05$)

Table 4.5.1 presents the fixed effect of panel data regression showing the effect of environmental sustainability cost, waste management costs, and environmental clean-up costs on net profit margin of listed oil companies in Nigeria.

| Variable | Coefficient | | | |
|----------|-------------|------------|-------------|--------|
| | t | Std. Error | t-Statistic | Prob. |
| C | 0.369397 | 0.146472 | 2.521970 | 0.0141 |
| LESC | 0.017870 | 0.022686 | 2.787689 | 0.0337 |
| LWMC | -0.003073 | 0.018734 | -0.164033 | 0.8702 |
| LECC | 0.001380 | 0.018483 | 0.074666 | 0.9407 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|-----------|----------|--------------------|----------|
| R-squared | 0.411966 | Mean dependent var | 0.454476 |
|-----------|----------|--------------------|----------|

Adjusted R-

| | | | |
|--------------------|-----------|-----------------------|----------|
| squared | 0.321499 | S.D. dependent var | 0.530101 |
| S.E. of regression | 0.436651 | Akaike info criterion | 1.313762 |
| Sum squared resid | 12.39316 | Schwarz criterion | 1.651105 |
| Log likelihood | -38.92296 | Hannan-Quinn criter. | 1.448581 |
| F-statistic | 4.553774 | Durbin-Watson stat | 1.571757 |
| Prob(F-statistic) | 0.000069 | | |

Source: Author's computation, 2025

| Variable | Co-efficient | Std. Error | t-Statistic | Prob. |
|----------|--------------|------------|-------------|--------|
| C | 0.530731 | 0.173668 | 3.056007 | 0.0031 |
| LESC | 0.006701 | 0.027754 | 0.241440 | 0.8099 |
| LWMC | -0.015300 | 0.022891 | -0.668363 | 0.5060 |
| LECC | -0.011197 | 0.022301 | -0.502088 | 0.6171 |

Effects Specification

| | S.D. | Rho |
|----------------------|----------|--------|
| Period random | 0.000000 | 0.0000 |
| Idiosyncratic random | 0.557636 | 1.0000 |

Weighted Statistics

| | | | |
|-----------------------------|----------|--------------------|----------|
| R-squared | 0.011290 | Mean dependent var | |
| 0.454476 Adjusted R-squared | | S.D. dependent var | 0.530101 |
| S.E. of regression | 0.537970 | Sum squared resid | 20.83763 |
| F-statistic | 0.274051 | Durban-Watson stat | |
| 0.886025 | | | |
| Prob(F-statistic) | 0.843926 | | |

Source: Author's computations, 2025

Table 4.5 2 presents the random effect of panel data regression showing the effect of environmental sustainability cost, waste management costs, and environmental clean-up costs on net profit margin of listed oil companies in Nigeria

| Variable | Coefficient | | t-Statistic | Prob. |
|----------|-------------|------------|-------------|--------|
| | t | Std. Error | | |
| C | 0.530731 | 0.173668 | 3.056007 | 0.0031 |
| LESC | 0.006701 | 0.027754 | 0.241440 | 0.8099 |
| LWMC | -0.015300 | 0.022891 | -0.668363 | 0.5060 |
| LECC | -0.011197 | 0.022301 | -0.502088 | 0.6171 |

| Effects Specification | | S.D. | Rho |
|-----------------------|----------|------|--------|
| Period random | 0.000000 | | 0.0000 |
| Idiosyncratic random | 0.557636 | | 1.0000 |

| | | |
|----------------------|----------|--------|
| Period random | 0.000000 | 0.0000 |
| Idiosyncratic random | 0.557636 | 1.0000 |

Weighted Statistics

| | | | |
|--------------------|-----------|--------------------|----------|
| R-squared | 0.011290 | Mean dependent var | |
| Adjusted R-squared | -0.029906 | S.D. dependent var | 0.530101 |
| S.E. of regression | 0.537970 | Sum squared resid | 20.83763 |
| F-statistic | 0.274051 | Durbin-Watson stat | |
| Prob(F-statistic) | 0.843926 | | |

Source: Author's computations, 2025

observed in net profit margin of listed oil companies in Nigeria is determined by changes in the value of the predictor variable, (environmental sustainability costs, environmental clean-up costs and waste management costs). This implies that about 67.86% of the changes in net profit margin are attributable to factors other the one considered in our study. The econometric value of F-ratio of 4.553774 is significant at 5% level and this further highlights the appropriateness of the model specification.

Again, the Durbin-Watson statistic of 1.1571757 indicated the absence of auto-correlation. Therefore, this study rejected the null hypothesis and concluded that the independent variables jointly has a significant influence on net profit margin of listed oil companies in Nigeria.

According to Table 4.3.1, there is evidence to support a probability value of 0.6024 and a regression coefficient of -0.008989 for environmental sustainability cost (ESC). This suggests that the return on capital used by Nigerian oil and gas businesses is negatively and negligibly influenced by ESC. The consequence is that oil firms in this study do not see the sustainability of the environment as vital as this is reflected in the amount of environmental sustainability cost. Our results contradict those of Madugba et al. (2020), who found that oil firms do make significant investments in their ESC. The lesser number of five (five) years employed in their investigation may be the cause.

The statistical evidence presented in Table 4.3.1 verified that the waste management costs (WMC) co-efficient of regression value was -0.009848. For the same variable, the displayed probability value is 0.4871. This indicates that WMC is a negligible and unfavourable factor that affects the return on capital used by Nigerian oil businesses. This suggests that Nigerian oil corporations are not adequately controlling or reducing the trash that results from their operations in the host communities, which explains why there are ongoing conflicts among young people and the disappearance of aquatic species in these areas. The regression coefficient for environmental clean-up costs (ECC) is -0.011076, and the probability value is 0.4311. This indicates that the return capital used by Nigerian oil corporations does not positively and significantly correlate with the expenses of environmental cleanup. It should be noted that this study did not take into account whether the expenses of cleanup would be sufficient to offset the impact of their distorting actions on the host communities.

Evidence points to a positive but negligible correlation between Nigerian oil firms' earnings per share and environmental sustainability expenses. A probability value of

~~0.0718 and a regression coefficient of 0.047426 support this. The implication is that the ESC of Nigerian firms will fall by the same amount for every unit increase in oil companies' earnings per share. Once more, the consequence is that their investment in environmental sustainability costs is excessively low in relation to their earnings..~~

According to Table 4.4.2, the cost of waste management has a regression coefficient of -0.04311. This indicates that the earnings per share of Nigerian listed oil companies are negatively yet significantly correlated with waste management costs. This suggests that the oil corporations' host cities' waste management investments are too minimal to have an effect on their earnings per share.

With a probability of 0.0716, Environmental Clean-up Costs (ECC) is shown to have a co-efficient of regression value of -0.039217. This indicates that ECC has a negative and negligible impact on the earnings per share of Nigerian oil companies. This could be because the government does not require the oil corporations to clean up the environment, or because the companies have ignored the effects of their operations on the host communities.

Based on the data presented in Table 4.5.1, which shows a positive but insignificant correlation between environmental sustainability costs and the net profit margin of Nigerian oil companies, we conclude that there is a significant relationship between environmental sustainability costs and the net profit margin of Nigerian oil and gas companies. This finding contrasts with that of Umoren et al. (2018), whose study found a negative and insignificant correlation between environmental accounting.

Even though these oil companies contribute to environmental sustainability, the host communities are not affected, which is why they are outraged about the detrimental effects of the companies' operations because their aquatic environment has been completely destroyed, along with their means of subsistence. This was not taken into account in this study, though.

According to the above data, the waste management cost (WMC) has a regression coefficient of -0.003075. This indicates that there is a negative and negligible correlation between WMC and the net profit margin of Nigerian oil businesses. The findings contradict those of Oti et al. (2018), whose research showed a positive and significant correlation between a firm's financial performance and waste management costs. It is implied that the host communities' relationship with the MNC would suffer over time as a result of the oil corporations' improper waste management practices, which would destroy the ecosystem and, consequently, their means of subsistence. The upshot is youth discontent in such neighbourhoods, which would have bad effect on the revenue of the companies.

Environmental cleanup costs have a positive but non-affirmative correlation with the net profit margin of Nigerian oil and gas corporations, as can be seen from Table 4.5.1 above. A co-efficient of regression value of 0.001380 supports this claim. One possible explanation for this conclusion is that the oil and gas firms have failed to clean up the oil spills in the host communities.

Summary of findings, conclusion and recommendation

Summary of Findings

i. The financial performance of listed oil and gas businesses in the Nigerian Exchange Group was analysed in this study for 10 fiscal years, from 2012 to 2021, in connection to green accounting. Discovered were the following:

In Nigerian listed oil companies, environmental sustainability costs have a negligible

and adverse impact on return on capital. Based on this research, the majority of Nigerian oil companies do not make investments in environmental sustainability to protect the environment in the communities where they operate.

ii. The cost of waste management and return on capital employed by Nigerian oil companies are negatively and insignificantly correlated, which is consistent with the findings of Umoren et al. (2018), who found no significant correlation between environmental accounting practices and performance variables (return on capital employed, net profit margin earnings per share, and earnings per share). This suggests that oil companies are not environmentally responsive because they do not prioritise waste control and management; the 3R's of waste management (reuse, reduce, recycle) should be ingrained in these companies' business strategies; and advanced technology that can turn waste into useful products is required. This will significantly lessen the ongoing juvenile violence, pipeline vandalism, and aquatic life loss that have left the inhabitants of the host villages in poverty.

iii. The regression coefficient for environmental clean-up costs (ECC) is -0.011076, and the probability value is 0.4311. This indicates that there is no positive and substantial correlation between the return on capital used by Nigerian oil corporations and the costs of environmental cleanup. Even while some of these businesses spend money cleaning up oil spills and getting rid of other hazardous material, the communities don't benefit from the investment because either the cleanup isn't done correctly or there aren't any government organisations keeping an eye on it.

In conclusion, a paradigm shift in the financial reporting of businesses has occurred, according to the Global Initiative (2011), as a result of the incorporation of green accounting alongside corporate social responsibility for more trustworthy and transparent reporting. Nigeria is just beginning to realize how important the green accounting idea is. After analysing the impact of green accounting on the financial performance of Nigerian listed oil firms, it has been determined that green accounting is a crucial factor in determining the successful and efficient management of listed oil companies in both developed and developing nations. Additionally, it showed that oil firms violate environmental rules in a variety of ways. The researcher believes that if oil companies in Nigeria adhere to environmental laws and governance principles, their financial health will be greatly improved, which will in turn increase stakeholders' confidence in the Nigerian oil sector. This is because the government of Nigeria, along with management, directors, and lower level managers, contribute to the incidence of non-compliance with environmental laws in the oil sub-sector and across the economy in various dimensions. In light of the study's conclusions, the researcher would like to suggest the following: Accounting organisations and the Nigerian Exchange group should, in fact, include a requirement in their rules that environmental costs be reported in business annual reports.

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