

Green Accounting Costs and Earnings Performance of Quoted Oil and Gas Firms in Nigeria: Does Firm Size and Dividend Per Share Matter?

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ABSTRACT: *The paper examined the effect of green accounting costs on the earnings performance of quoted oil and gas firms in Nigeria from 2013 to 2022. The study specifically examined the extent of green accounting costs on earnings per share (EPS) of quoted oil and gas firms in Nigeria from 2013 to 2022. The study controlled for firm size and dividend per share. The study adopted the panel regression approach and confirmed that having controlled for firm size and dividend per share; environmental accounting costs improved the earnings per share of quoted oil and gas firms in Nigeria from 2013 to 2022. Hence, the paper concludes that the more the sampled firms incur more costs on environmental issues, the higher they report earnings per share. Consequently, the paper submits that the regulatory authorities in the oil and gas sector must ensure that all firms consider both environmental compliance costs and ecological remediation costs while developing their investment model since environmental costs are a critical predictor in the determination of EPS.*

Keywords: Green Accounting Costs, Environmental Compliance Cost, Environmental Remediation Costs, Performance, Earnings per Share.

INTRODUCTION

Man, as a rational being, has always wanted to maximise his output within his environment. The man's desire leads to various activities such as producing goods and services, ensuring good and adequate accommodation and urban development. According to Aruomoaghe and Agbo (2015), "Man's recent activities within the environment have resulted in resource depletion and environmental degradation. These activities have further led to the depletion of the ozone layer, thereby causing an imbalance in the environmental system". Environmental Accounting's costs and obligations are significantly growing as the world becomes more environmentally conscious. Agrawal and Sharma (2020) noted that the natural resources constantly explored and exploited by oil and gas companies are not without their imminent environmental impact, such as emissions, hazardous waste, oil contamination, biodiversity loss (wildlife, agro diversity) and global warming. These natural resources are tapped to enhance economic developments that are finite, non-renewable and subject to diminution. However, a country (like Nigeria) realises a huge amount of money daily realises a huge amount of money daily from crude oil sales and its by-products. Therefore, this money should have a significant impact, at least on the development of oil and on the mineral-producing communities.

The basic principle of "materiality" in conventional accounting precludes the reporting of environmental information, given the relative difficulty of identifying and quantifying some categories of ecological cost and benefits (Akpoveta et al., 2023; Casimir, 2019; Oti & Mbu-Ogar, 2018). The recognition criteria of financial accounting require an item to have a cost or other values that can be measured financially and reliably. Hence, some attempts to assign value to external environmental impacts move quickly into estimates with their associated controversies concerning methodology. In conventional accounting, expenses exclude the recognition of any effects on resources not controlled by the entity unless fines or other cash flow result (Bennett & James, 2017).

Currently, the company is required to prioritise the owners and management as well as all relevant parties (stakeholders), such as employees, customers, the community and the environment (Homan, 2016). This is because the company's existence cannot be separated from the interests of various parties. One of them is the support of the environment. Often, efforts to enhance efficiency and productivity result in environmental degradation, such as air and water pollution, and the reduction of soil functions. Protecting the environment and benefiting the community around it is also beneficial for the company in the long term.

Nevertheless, Nigeria's oil and gas companies usually face youth restiveness due to unemployment and the non-availability of social amenities. These factors culminated in the series of vandalisation of oil pipelines and other valuable companies' properties. Balancing financial performance with environmental costs is a major challenge in today's economic development (Solomon, 2020). The problem could be ameliorated if the oil and gas companies manage their social and environmental costs efficiently and effectively. It is also pertinent to state that previous related studies based their analyses of firm performance on financial factors alone (Anggraini et al., 2020). However, this study fills the vacuum by controlling for the number of shareholdings. Hence, this research aimed to examine the association between environmental accounting cost and earnings performance of quoted oil and gas firms and, therefore, tried to answer the following research questions:

Research Question (RQ): To what extent has environmental accounting costs affect earnings per share?

LITERATURE REVIEW

Green accounting is a broad term that has many meanings and practices. It is an inclusive field of accounting that provides information for internal and external stakeholders of organisations. The function of environmental accounting is to measure environmental performance (Ighosewe, 2021). *Green Accounting* is defined as a process through which companies disclose information relating to environmental performance for evidence that they are accountable for their activities (Solomon, 2020). Meanwhile, environmental accounting cost is the amount the companies pay for environmental protection (Ehiedu & Eyamu, 2023). Many researchers used environmental cost as a cost that the companies paid for the protection of the environment and as a proxy of environmental accounting.

On the other hand, earnings performance measures how well a firm can use assets from its primary business mode and generate revenues. The term is also used to measure a firm's overall financial health over a given period. Financial performance measures the results of a firm's policies and operations in monetary form (Oyedokun et al., 2019). Specifically, the paper focused on Earnings per share (EPS). EPS is an important financial measure that indicates a company's profitability and shows how much money it makes from each stock share. The higher the earnings per share of a company, the better the profitability; it is calculated by dividing the company's net income by its total number of outstanding shares (Casimir, 2019). Earnings per share is also a performance index through which stakeholders can compare the performance of different organisations for good decision-making. Earnings per share are obtained by dividing total earnings, after interest, tax and preferred dividend, by the total number of ordinary shares outstanding. Enakirerhi and Ighosewe (2024) reported that firm size (natural logarithm) is a key firm predictor.

Theoretically, the study is anchored on the stakeholder theory of organisation management and business ethics, which deal with values and morals in managing an organisation. The stakeholder theory was first described by Edward Freeman in 1983 and suggests that shareholders are merely one of many stakeholders in a company. This theory maintains that there is a need for an organisation to engage in an active social role in the society where it is operating since it depends on the society for sustenance (Ojo, 2012). The main concern of the stakeholder's theory in environmental accounting is to address the environmental cost elements and valuation and their inclusion in the financial statements. Investors, shareholders, employees, customers, suppliers, government and communities can influence organisational performance, and managers must ensure that their demands are satisfied accordingly. The proponents of this theory believe that the increase in expenditure on corporate social costs in the past decade suggests that managers have found an economic benefit from social cost programme programmes. They further stated that most studies found a positive relationship (Allouch & Laroche, 2015; Luo, 2016).

Romandhon, Pramuka, Lestari, and Kaukab (2023) examined the effect of green accounting disclosure on the performance of 43 companies listed in Indonesia from 2019-2022. The linear regression was used to analyse the data. The results of green accounting disclosure improve firm performance.

Similarly, Doobee, Uwaoma and Johnson (2024) examined the effect of green accounting practices on listed oil and gas companies' performance in Nigeria from 2010-2023. Panel data were collected from the annual reports of listed oil and gas companies. The study confirmed that green accounting contributed meaningfully to performance (Tobin's Q).

Ike, Adeneye, and Anuolam (2024) examined the effect of environmental protection expenditures (EPE) on the financial performance (ROE, ROA and EPS) of industrial goods firms in Nigeria from 2011 to 2020. The researchers used the content analysis approach to get the EPE data, while the ROA and ROE data were obtained from the sampled firms' annual reports. Panel regression analysis was used to run the regression. The study confirmed that EPE reduces ROA and EPS minimally but improves ROE minimally.

Al-Waeli, Khalid, Ismail and Idan (2021) examined the effect of environmental disclosure on the performance of industrial companies in Iraq. The study confirmed that environmental disclosure improves the performance of Iraq firms.

Similarly, Oraka (2021) confirmed that higher environmental remediation costs improve oil and gas companies' performance (Tobin Q) on the Nigerian Stock Exchange. The objectives were to ascertain the effect of environmental remediation cost on Tobin's Q of Nigeria's 12 sampled oil and gas companies. Also, Nwaiwu and Oluka (2018) confirmed that environmental cost disclosure improved the performance of sampled oil and gas firms.

Obara and Nangih (2017) examined how accounting practices affect firms' profitability in the oil and gas upstream sector. The researchers used 84 respondents. They formulated hypotheses and analysed data using SPSS software and other descriptive statistical tools like percentages and tables. The study showed that accounting practices significantly influenced the performance of oil and gas companies, particularly the ROA and ROCE.

Onga Ng and Soh (2016) investigated environmental management systems and financial performance. The study sampled 68 manufacturing firms out of the 254 firms quoted in Bursa Malaysia in 2013. Descriptive statistics, Pearson correlation analysis, linear regression test and analysis of variance (ANOVA) were used. The study revealed that firms with above-average performance have a greater tendency to pursue International Standards Organization (ISO) certification. The results also showed a significant relationship between ISO 14001 certification and a company's financial performance.

From the literature reviewed, the researchers used performance metrics such as ROA, ROE, PAT, and ROCE, but this study moved further by using both financial and non-financial indicators, ROCE and EPS, alongside two control variables, SIZE and DPS. This is to determine the effect of firm size and shareholding on the sampled firms' performance.

METHODOLOGY

The study adopted both descriptive and analytical ex-post facto research design, which refers to the studies that examined the possible cause-and-effect relationship by observing an existing condition for plausible causal factors. This method is relevant to the study because it depends on secondary data needed to achieve research objectives. Researchers like (Asika et al., 0 and 17) have used ex-post facto design in a similar search methodology. The study population and the sample size are the ten (10) oil and gas companies adopted. This study was centred purely on secondary data. The data will be retrieved from corporate annual reports of quoted oil and gas companies in Nigeria. A time series of annual financial reports of 10 listed oil and gas companies in Nigeria from 2013 to 2022 will be used. The researcher utilises only corporate financial annual reports because they are readily available and accessible and also provide a greater potential for comparability of the result. More so, they are produced yearly and kept in the public sphere.

To avoid spurious results, the study will employ a unit root test; further study used descriptive statistics to check the normality of the data. The data were analysed using panel regression analysis (Random Effect Model). The study adopted the model from Adams (2017) with little modification to his model. The model specification is as presented below:

$$EPS = f(EPS, SIZE, DPS)..... (1)$$

The expression above can be written explicitly as:

$$EPS_t = \beta_0 + \beta_1GREAC_t + \beta_2SIZE_t + \beta_3DPS_t + \mu_t..... (2)$$

The explicit form of the model in (3) stated in log-linearised form is presented as:

$$LPES_t = \beta_0 + \beta_1LGREAC_t + \beta_2LSIZE_t + \beta_3LDPS_t + \mu_t..... (3)$$

Where:

- GREAC_t = Environmental Accounting Cost at Time t
- EPS_t = Earnings per Share
- SIZE_t = Firm's Size
- DPS_t = Dividend per Share
- LGREAC_t = Logarithms of Environmental Accounting Cost
- LEPS_t = Logarithms of Earning per Share
- LSIZE_t = Logarithms of Firm Size
- LDPS_t = Logarithms of Dividend per Share
- β₀ = Constant
- β₁ - β₅ = Coefficient of variables
- μ_t = Error term

Table 1 presents how the study variables were operationalized:

Table 1: Operationalization of Variables

Variable	Description	Measurement	Source	Aprior i sign	Type of variable
GREAC	Green Accounting Cost	Annual amount spend by companies environmental protection	Muhammed Ahmad, 2018		Dependent
EPS	Earnings per share	$\frac{PAT \text{ and after pref div}}{\text{Number of ordinary shares}} \times 100$	Casmir, 2019	-	Independent
SIZE	Firm size	Annual revenue of firms	Stavins and Whitehead, 2012	+	Control
DPS	Dividend per Share	$\frac{\text{Ordinary share dividend}}{\text{Number of ordinary shares}}$	Danjuma, 2018	+	Control

Source: Researcher's compilation (2024)

4. Results and Discussions
Descriptive Statistics

Descriptive analysis was used to encapsulate the summary of the coefficients in the data sets. The result revealed the average (means) performance and variations (standard deviations) in the earnings performance of the sampled companies. The summary of the descriptive statistics is presented in Table 2:

Table 2 Summary of Descriptive Statistics

	GREAC	EPS	SIZE	DPS
Mean	0.195436	249.5236	13.67727	36.13412
Maximum	0.845600	783.0000	518.0000	80.33130
Minimum	0.000000	3.000000	0.330000	21.25314
Std. Dev.	0.179402	281.6050	65.40633	11.07016
Observations	110	110	110	110

Source: Authors' Computation (2024)

From Table 2, green accounting cost reported an average value of 0.195436 but deviated by 0.179402, suggesting that GREAC clustered around its average value. Meanwhile, EPS has an average value of N249.52kb but fluctuated by N281.6050kb, suggesting that EPS is highly volatile. Further, firm size (SIZE) and dividend per share (DPS) reported average values of 13.67727 and 36.13412 but deviated by N65.41kb and 11.07016. Further, they reported maximum values of N518.00kband 80.33130 and minimum values of N0.33kb and 21.25314.

Panel Unit Root Test

The panel unit root is used in the study to check the stationarity properties of the variables and avoid spurious results. The Levin, Lin & Chu test is presented in Table 3:

Table 3: Summary of Panel Unit Root Test

Variables	Levin, Lin & Chu t-Statistics	Order of Integration	P-value	Decision
GREAC	0.10518	1(1)	0.0419	Stationary
EPS	-297.415	1(1)	0.0000	Stationary
SIZE	-692.332	1(0)	0.0000	Stationary
DPS	-2.37255	1(0)	0.0088	Stationary

Source: Authors' Computation (2024)

The results indicated that all the variables were not stationary at levels in almost all the methods, but became stationary in all the methods at first difference. This led us to the conclusion that the pooled and random effect methods are unsuitable. Therefore, we chose the fixed effect method of panel OLS for the analysis in this study, a logical and necessary transition. To be able to affirm the best model between the fixed effect and the random effect, the Hausman test was conducted. The Hausman test is presented in Table 4:

Table 4: Summary of Diagnostic Test

S/N	Test Summary	Chi-Sq. Statistic/ F-Statistic	P-Value	Conclusion
1	Hausman Test	15.331213	0.0090	Fixed Effect Model (FEM)

Source: Authors' Computation (2024)

The result indicated that the probability value of the chi-square statistic was statistically significant at the 5% level, which revealed that the use of a fixed-effect model was more reliable for the study.

Discussion

Having confirmed that the fixed effect model was more reliable for the study than the Random Effect model (REM), the FEM estimate is presented in Table 5:

Table 5: Fixed Effect Model-FEM

Dependent Variable: LEPS

Periods included: 11

Cross-sections included: 10

Total panel (balanced) observations: 110

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.132784	0.085921	1.545425	0.1256
LGREAC	0.000103	0.000152	0.677161	0.0299
LSIZE	0.000113	0.000213	0.530943	0.5967
LDPS	0.003719	0.001987	1.871663	0.0043
Cross-section fixed (dummy variables)				
R-squared	0.755418	Mean dependent var		0.195436
Adjusted R-squared	0.789900	Durbin-Watson stat		2.193609
F-statistic	8.477409	Prob(F-statistic)		0.000000

Note: L denotes logarithm**Source: Authors' Compilation (2024)**

The result reported a high R-squared of 0.755418, which implied that 75% of variations or changes in the environmental accounting cost among the sampled oil and gas companies in Nigeria are explained by changes in the firm's performances measured in terms of earnings per share, size of the firm, and number of shareholders. The Durbin-Watson statistic value of 2.193609 indicates that the model is free from serial correlation problems. The F-statistical probability value of 0.0000 indicated that the regression model fits the data at more than 95% confidence level. The research hypotheses are tested thus:

Specifically, the EPS variable was correctly and positively signed (0.000103) and statistically significant with a p-value of 0.0299. The estimated positive sign coefficient of 0.000103 suggests that a unit increase in earnings per share would increase environmental accounting costs by 0.010%. This implies that environmental accounting costs are value-added and that the sampled firms are highly environmentally sensitive.

The size variable was positive (0.000113) and correctly signed, but it is insignificant as the p-value was 0.5967. By implication, firms with larger asset bases are not the most environmentally friendly and that larger firm size/asset base does not translate to a higher profit base. The DPS was positive (0.003719) and statistically significant with a p-value of 0.0043, which implied that the DPS among the sampled oil and gas companies influenced the GREAC in Nigeria. Hence, a unit increase among the sampled oil and gas companies would increase GREAC by 0.37%.

5.0 Conclusion and Recommendations

The paper examined the effect of green accounting costs on the earnings performance (EPS) of quoted oil and gas firms in Nigeria from 2013 to 2022. The study adopted the panel regression approach and confirmed that having controlled for firm size and DPS, green accounting costs improved the EPS of sampled firms in Nigeria from 2013 to 2022. Hence, the paper concludes that the more the sampled firms incur more costs on environmental issues, the higher they report EPS. Consequently, the paper submits that the oil and gas sector regulatory authorities must ensure that all firms consider compliance and environmental remediation costs while developing their investment model since ecological costs are critical predictors in determining EPS.

REFERENCES

- Adams, R. (2017). Linking financial and environmental performance. *Environmental Accounting and Auditing Reporter*, 2(10), 331.
- Agrawal, D., & Sharma, R. (2020). Impact of Economic Factors on Green Audit and Reporting Practices. *International Journal of Advances in Social and Economics*, 2(2). 2 – 21
- Ahmad, M., Waseer, W.A., Hussain, S. & Ammara, U. (2018). Relationship between environmental accounting and non-financial firms performance: An empirical analysis of selected firms listed in Pakistan Stock Exchange, Pakistan. *Advances in Social Sciences Research Journal*, 5(1), 197-209.
- Akpoveta, O.A. Agbor, S.I. & Josiah, M. (2023). Value relevance of environmental sustainability reporting: evidence from listed consumer goods firms in Nigeria and Ghana. *International Journal of Applied Research in Social Sciences*, 5(8), 283-291.

- Anggraini, D., Aryani, D., & Prasetyo, I. B. (2020). Analisis Implementasi Green Banking Dan Kinerja Keuangan Terhadap Profitabilitas Bank Di Indonesia (2016-2019). *JBMI (Jurnal Bisnis, Manajemen, Dan Informatika)*, 17(2), 141–161.
- Asika, O.L., Chitom, A. & Chelichi, V. (2017). Determinants of environmental disclosures in Nigeria: A case study of oil and gas companies. *International Journal of Finance and Accounting*, 4(3), 145-152.
- Bassey, E.B., Effiok, S.O. & Eton, O.E. (2013). The impact of environmental accounting and reporting on organization performance of selected oil and gas companies in Niger Delta Region of Nigeria. *Research Journal of Finance and Accounting*. 4(3), 57-73.
- Bennett, B. & James, A. (2017). *Regulation of corporate accounting calculates*. The World Press Calcuta Private Limited
- Casmir, I. (2019). Teach yourself corporate reporting (Ed), Piccas Global Concept (pp.55-79) Lagos, Nigeria.
- Doobee, L.P. Uwaoma I.I. & Johnson, N.N. (2024). Green Accounting practice and listed oil and gas companies performance metric in Nigeria. *Social Science and Humanities Research*, 7(6), 1-20.
- Ehiedu, V. C., & Eyamu, F. O. (2023). Green financing initiatives and economic stability in Nigeria. *Advance Journal of Management, Accounting and Finance*, 8(6), 10-20.
- Enakirerhi, L. I., & Ighosewe, F. E. (2024). Growth in revenue and earnings management practices in Nigeria pre-and post-IFRS adoption periods. *International Journal of Applied Economics, Finance and Accounting*, 18(1), 88-97.
- Homan, J.R. & Mowen, MM. (2016). Cost management, accounting and control, Third edition, *South-West College Publishing a division of Thomson Learning*
- Ighosewe, E. F. (2021). Corporate Sustainability Disclosure and the Nigerian Industrial/Consumer Goods Sector's Performance: A Panel Data Approach. *International Journal of Research and Innovation in Social Science*, 5(3), 622-627.
- Ike, . R. C. ., Adeneye, O. ., & Anuolam, M. O. (2024). Environmental protection expenditures and financial performance of listed industrial goods firms in Nigeria. *Advance Journal of Management, Accounting and Finance*, 9(2), 1–19.
- Luo, J. (2016). The disclosure system of social responsibility. *Financial Communication*, 10, 118-120.
- Nwaiwu, N.J. & Oluka, N.O. (2018). Environmental cost disclosure and financial performance of oil and gas in Nigeria. *International Journal of Advanced Academic Research*, 4(2), 1-23.
- Obara, L.C. & Nangih, E. (2017). Accounting practices and performance of oil and gas industry (Upstream sector) in Nigeria: An empirical analysis. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(2), 215-222.
- Oti, P.A. & Mbu-Ogar, G.B. (2018). Analysis of environmental and social disclosure and financial performance of selected quoted oil and gas companies in Nigeria (2012-2016). *Journal of Accounting and Financial Management*, 4(2), 1-12.
- Oyedokun, G.E., Egberioyinemi, E. & Tonademukaila, A. (2018). Environmental accounting disclosure and firm value of industrial goods companies in Nigeria. *Journal of Economics and Finance*. 10(1), 7-17.
- Romandhon, R., Pramuka, B. A., Lestari, P., & Kaukab, M. E. (2023). The impact of disclosure of green accounting information on company performance on the Indonesia Stock Exchange. *Contaduría y Administración*, 70(1), 484
- Solomon, P.J. (2020). Environmental disclosure and financial performance of listed oil and gas companies in Nigeria: A review of literature. *Journal of Business and Management*, 22(9) 58-66
- Van, H. (2012). Environmental accounting – A new challenge for the accounting system. *Public Finance Quarterly*, 57(4). 437-452.
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