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## ENVIRONMENTAL COST DISCLOSURE AND CORPORATE PROFITABILITY: EVIDENCE FROM NIGERIAN OIL AND GAS FIRMS

Seiyaibo Carl MADAWA PhD, ACA<sup>1</sup> & Frank, Orits EBIAGHAN<sup>2</sup>

<sup>1</sup>Director of Treasury, Office of the Accountant General,  
Treasury Building, Onopa Yenagoa, Bayelsa State Nigeria

<sup>2</sup>Department of Accounting  
Faculty of Management Sciences,  
Delta State University Abraka Nigeria

\*Corresponding Author: Frank, Orits EBIAGHAN  
Corresponding Author Email: [oritz001@yahoo.com](mailto:oritz001@yahoo.com)

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### ABSTRACT

Environmental Accounting as an emerging field in accounting pedagogy and practice is gaining wide acceptance among stakeholders as they communicate significant information regarding the sustainability of the firm's activities while assisting management in enhancing environmental performance of their firm. This research aims at examining the effect of environmental cost disclosure (ECD) on corporate profitability in listed oil and gas firms in Nigeria, adopting ex-post facto research design, 10 firms were sampled from a population of fifty listed oil and gas firms. Data on Return on equity (ROE), Net Profit Margin (NPM) and Earning per share (EPS) were gleaned from the annual reports of the sampled firms from 2010-2020, the research findings, indicates that ROE have negative and significant effect on environmental cost disclosure of firms, net profit margin (NPM) has a positive relationship with environmental cost disclosure among listed firms and earnings per share (EPS) have no significant effect on environmental cost disclosure among listed oil and gas firms in Nigeria.

It is therefore recommended that Firms should ensure efficient management of environmental conservation costs in order to enhance their profitability.

**Keywords:** Environmental Cost Disclosure, Return on Equity, Earnings per Share, Net Profit Margin, Environmental Management Accounting.

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## INTRODUCTION

Contemporarily, there has been an increase in global environmental consciousness coupled with the advocacy to ensure improved eco-friendly and efficient practise in the work place, (Huppes & Ishikawa, 2009; Boiral & Henri, 2012; Le Blanc, 2015; Bebbington & Unerman, 2018; Waal & Thijssens, 2019). Owing to increased Economic and technological advancement across the world which has triggered harmful environmental consequences like global warming, depletion of non-renewable resources, attenuation of land resources, oil spillages, acidification and reduction of water resources (Huppes & Ishikawa, 2009; Soyemi, Okewale & Olaniyan, 2021), Environmental sustainability and disclosure has become a major concern of global, national, sub-national and corporate entities,. government institutions and regulatory agencies are actively campaigning for environmental sustainability by issuing resolutions, policies and standards , incorporated in the United Nations' Sustainable Development Goals (SDGs), are goals 12 (responsible consumption and production) and 13 (climate action) which emphasises sustainable climate action and eco-efficient production respectively.

The desire to ensure sustainability of business operations has compelled firms to devise alternative eco-friendly means of enhancing their business processes, to this end, firms are now exploring eco-efficient production methods that guarantees marginal environmental consequences. (Bebbington and Unerman, 2018, Ebiaghan 2020); Ngwakwe 2018, Omaliko, Nwadiolor & Nwese, 2020). We can define Environmental disclosure (hereinafter referred to as ECD) as any public information characteristically contained in a firms' annual report relating to activities classified under corporate social responsibility also referred to as sustainability or eco-reports (Dyllick & Hockerts, 2016). Deliberate disclosure of corporate environmental impact assessment report is gaining the interest of academic inquiry in several countries owing to the belief that they communicate significant information regarding the sustainability of the firm's activities (Bassey, Sunday & Okon, 2013). Saha & Akter (2013) opined that disclosure of environmental information guarantees transparency of annual report, equally Environment Management Accounting (EMA) provides internal information to assist management in enhancing environmental performance of their firm, while Environment Financial Accounting (EFA) presents external information stakeholders. (Ngwakwe, 2018, Orits, Jeroh, & Ideh 2021).

Presently, it is widely believed that social responsibility, sustainable development and environmental-protection reporting constitute an effective and efficient way to appreciate environmental performance and risks. Hence several oil and gas firms in Nigeria logically covet the goodwill of host communities, investors, financial institutions, stockholders and citizens..

### **Rationale for the Study**

Despite the rising interest in corporate environmental impact assessment, the extant literature is replete with conflicting opinions regarding the relationship between corporate environmental

cost disclosure and profitability. (Al-Najjar and Anfi miadou, 2012;Dowelletal.,2000;Ingram&Frazier,2013; Peck and Sinding, 2003; PwC, 2016; Walley and Whitehead, 1994) (Judge & Douglas, 2018). (Rockness *et al.*, 2016). However, in spite of the increasing acceptance of sustainable business practices in Africa, studies on its effects on corporate earnings is relatively scanty in the literature (Iredele et al., 2019; Moses et al., 2020,Ideh, Jeroh & Ebiaghan 2021).Thereby leaving policy formulators and corporate entities in these countries with weak foundations for making environmental decisions. Therefore, this study extends the frontiers of previous research (Al-Najjar and Anfi miadou, 2012; Sinkin et al., 2008) by examining the effect of ECD on corporate profitability in emerging economies. The specific objectives of this research effort include the following:

- i. To Ascertain the effect of environmental cost disclosure on profitability of oil and gas companies in Nigeria.
- ii. To Ascertain the impact of environmental cost disclosure on return on equity of oil and gas companies in Nigeria.
- iii. To ascertain the impact of environmental cost disclosure on earning per share of oil and gas companies in Nigeria

## **LITERATURE REVIEW**

### **Conceptual Review**

**Environmental Disclosure:** Environmental disclosure is closely related to company's policies, attitudes toward environmental impact, emissions, pollution, cleaning, planting, and energy efficiency. To have a better understanding of the concept of environmental disclosure there is a need to view the definitions of environmental accounting from distinctive points. Environmental accounting serves as a contributor of environmental information to internal and external parties. Environmental accounting functions internally to provide information to assist management in improving environmental performance of firms, while function of external environmental accounting is present information to external parties or company stakeholders. It is generated by environment accounting system which is part of overall environmental information that is disclosed by company (Ngwakwe, 2018).

Environmental disclosure is defined as any information that a firm makes public, typically within or alongside its annual accounts or in a stand-alone report that relates to its performance, standards or activities under the corporate social responsibility umbrella. Such documents are most commonly known as sustainability reports, but they are also known as corporate social responsibility reports, eco-reports, and corporate accountability reports (Ngwakwe, 2018).

### **Empirical Review**

Okafor (2018) ascertained the nexus between environmental costs and firm performance, utilizing corporate reports of listed firms spanning 2006-2015, findings from their analysis indicated that improved eco-performance positively correlated with organizational value by availing the opportunity to reduce social and environmental cost thereby improving performance.

Nnamani (2017) evaluated the relationship between financial performance and sustainability accounting of listed Nigerian manufacturing firms. Using secondary data analysed through the OLS estimation technique, findings from the study indicated that sustainability reporting had a positive relationship with financial performance of sampled firms.

A similar study of environmental accounting and organizational performance among the oil and gas companies operating in the Niger Delta Region of Nigeria was conducted by Bassey, Effiok & Eton (2013). The primary and secondary data were obtained and Pearson's Product Moment Correlation Coefficient (PPMCC) was the statistical tool employed. The study revealed that environmental cost significantly correlated with a firm's profitability. Okafor (2018) on the same note investigated firm's liquidity and environmental disclosures using regression model and discovered insignificant effect.

In sub-Saharan Africa, Nyirenda et al. (2018) examined the impact of environmental management practices on the financial performance of a South African mining firm. Using the Socially Responsible Index (SRI) of Green Steel listed in the Johannesburg Stock Exchange (JSE), multiple regression statistics, the result indicated no significant relationship between the variables thus lending credence to information gathered from Green-Steel environmental reports that Green-Steel's environmental management practices are driven mostly by a desire to abide by regulations and also by a moral obligation to use environmental management practices to mitigate climate change impact.

Royet (2016) conducted a study on the effect of environmental disclosures on dividend pay-out of listed manufacturing firms in France explored the test tool of multiple regression and discovered significant positive relationship between environmental disclosures measured using employees' health and safety disclosure and environmental remediation disclosures with dividend pay-out of firms. Based on this, the study concludes that environmental disclosures have exerted significant influence on firm's dividend pay-out.

Deume & Knechel (2016) study was on pollution control disclosures and dividend policies of listed manufacturing firms in Germany explored the test tool of OLS for the test of hypothesis and discovered that firms with a higher pollution propensity and greater media coverage of their environmental performance are more likely to disclose general environmental information, a result also consistent with improving dividend pay-out of firms.

## **RESEARCH METHODOLOGY**

### **Research Design**

This study adopted *ex post facto* research design. This is because it will assist in determining the determinants of the Effects of Environmental Disclosure on Profitability of Nigeria Oil and Gas companies.

### **Sample and Sampling Technique**

This study utilized secondary data. Collected from the published financial statements of the ten (10) Oil and gas companies for eleven (11) years period spanning from 2010-2020, using Purposive sampling method, and their indices consist of Return on equity, Net Profit Margin, and Earning per share.

### **Model Specification**

The model for this study is adapted from Okafor (2018) model. Our model is therefore stated below:

#### **Model One: (ECD and ROE)**

$$ECD = \alpha + \beta_1 ROE + U_t$$

#### **Model Two: (ECD and EPS)**

$$ECD = \alpha + \beta_2 EPS + U_t$$

**Model Three: (ECD and NPM)**

$$ECD = \alpha + \beta_3 NPM + U_t$$

**Where:**

ECD = Environmental Cost Disclosure

ROE = Return on Equity

EPS = Earnings Per Share

NPM = Net profit Margin

$U_t$  = Error term

$b_1, b_2, b_3 > 0, b_4 \leq 0$  are regression coefficients.

The apriori expectation is that Environmental Disclosure and profitability have a positive relationship with the Return on Equity (ROE), Net Profit Margin (NPM), and Earnings per Share (EPS) for the period under study. Amount spent by each company as their environmental cost was used as proxy for environmental disclosure, while Return on Equity (ROE), Net Profit Margin (NPM), and Earning Per Share (DPS) were used as proxy for firm profitability. It is important to note here that Administrative cost was used in this model as a control variable; this enabled us to avoid the problem of multicollinearity in the model. It also helped us to overcome the problem associated with simple regression analysis. The above model was used to test the variables among the within the sample size.

It is therefore hypothesized that :

**H<sub>01</sub>** Environmental cost disclosure does not have any significant effect on the profitability of oil and gas companies in Nigeria

**H<sub>02</sub>** Environmental cost disclosure does have any significant effect on return on equity of oil and gas companies in Nigeria

**H<sub>03</sub>** Environmental cost disclosures does not have any significant effect on earnings per share of oil and gas companies in Nigeria

**DATA PRESENTATION AND ANALYSIS****Descriptive Statistics**

The results of the descriptive statistics of the variables are presented in Table 1 below:

Table 1

*Summary of Descriptive Statistics of the Variables of the Study*

Variable	Obs	Mean	Std. Dev.	Min	Max
ECD	79	.0158228	.0418286	0	.125
ROE	79	12.45247	120.6024	-393.9688	872.2048
NPM	79	44.29204	651.7963	-704.2364	5640.101
EPS	79	5.312532	8.830644	-20.23	43.58

Source: Researcher's Computation, 2022.

Table 1 presents the summary of the descriptive statistics of all the variables of concern in this study. The dependent variables are return on equity (ROE), net profit margin (NPM) and earnings per share (EPS) while the independent variables are environmental cost disclosure (ECD). As indicated in the table, we have a uniform number of observations for the different explanatory variables due to the fact that all companies had complete records of their recorded activities. The recorded observations for environmental cost disclosure (ECD), return on equity (ROE), net profit margin (NPM), and earnings per share (EPS) stood at 79 each. The data collected was from 74 companies over a period of 10 years. As observed, environmental cost

disclosure (EID) recorded a mean and standard deviation of .0158228 and .0418286 respectively. Note that while the mean explains the average amount of values recorded for the data on each variable, the standard deviation (Std. Dev.) measures the level of variability of the data.

With regards to the dependent variables, Table 1 further reveal that measures of performance (ROE, NPM and EPS), recorded means and standard deviations of 12.45247, -44.29204, 5.312532 and 120.6024, 651.7963, 8.830644 respectively. Low standard deviation means data are clustered around the mean, and high standard deviation indicates data are more spread out. A standard deviation close to zero indicates that data points are close to the mean, whereas a high or low standard deviation indicates data points are respectively above or below the mean. The low standard deviation recorded by most of the measures of performance suggests that a company may be mismanaged and could be reinvesting earnings into unproductive assets. The respective minimum values recorded for return on assets (ROE), net profit margin (NPM) and earnings per share (EPS) are -393.9688, -704.2364, and -20.23; whereas, the maximum values were 872.2048, 5640.101 and 43.58 respectively.

### Correlation Analysis

The results obtained from correlation analysis presents the coefficients for each pair of variables in a study. These coefficients are usually in the form of numbers with designated signs that researchers use to describe the direction of relationship between pairs of variables under a given study. With the signs attached to the coefficients, it is possible for researchers to detect whether two paired sets of variables are moving in the same or opposite direction. Where the coefficients carries a positive sign it means a positive relationship and where it carries a negative sign it means a negative relationship. However, when the correlation coefficient is close to 0, there is no evidence of any relationship and where an independent variable carries a coefficient of 0.8 and above it shows the presence of multicollinearity.

We therefore subject this with the above in mind, the data for this study were subjected to the correlation analysis and the Pearson Correlation Coefficient was adopted. The result of the correlation analysis is shown in Table 2.

Table 2  
*Result of Correlation Analysis*

Variable	ECD	EPS	ROE	NPM
<b>ECD</b>	1.0000			
<b>EPS</b>	-0.2065	1.0000		
<b>ROE</b>	-0.0007	0.2948	1.0000	
<b>NPM</b>	-0.0248	0.0591	0.5099	1.0000

Source: Researcher's Computation, 2022.

Table 2 presents the correlation results for the entire variable set. As indicated above, apart from return on equity (ROE), the correlation coefficients between the independent variable environmental cost disclosure (EID) and all other measures of performance net profit margin (NPM) and earnings per share (EPS) were negative. Additionally, it could be observed also that the correlation coefficient between pairs of independent variables either indicate negative or positive relationship. A further cursory look at the results in Table 2 indicated that the independent variables did not show signals of the existence of multicollinearity. This is evident in the Pearson Correlation (Pearson *R*) between pairs of independent variable that was found

to have ranged from -0.0007 to 0.5099. The lowest Pearson  $R$  of -0.0007 was found between environmental cost disclosure (ECD) and return on equity (ROE) whereas, the highest Pearson  $R$  of 0.5099 was found between return on equity (ROE) and net profit margin (NPM). Since no pair of independent variables had Pearson  $R$  close to or about 0.80 and above, we thus argue that the independent variables used in this study do not have issues of multicollinearity. To confirm this assertion, the variables were subjected to other diagnostic tests and the results are as shown in next section.

### Result of Multicollinearity Test Using VIF

In this section, the results for the multicollinearity test for the independent variables were presented. In order to test for multicollinearity, the Variance Inflation Factor (VIF) test was conducted and the result is hereunder presented.

Table 3

*Variance Inflation Factor Results for Independent Variables*

Variable	ROE	NPM	EPS	Mean VIF
VIF	3.54	3.24	1.22	2.67
1/VIF	0.282865	0.308701	1.819297	

Source: Researcher's Computation, 2022.

From Table 3, the range of VIF for the independent variables did not exceed the standardized VIF level (1.22:3.54<10.00). Overall, the mean VIF obtained is 2.67 which suggests the absence of multicollinearity among the independent variables. This result further confirms the fitness of the specified models in this study.

### Test of Hypotheses

This section presents the results of the tests of hypotheses. Since this is a panel study, the researcher made efforts to control for the effect of heterogeneity common among panel datasets. In achieving this, the test of hypotheses was based on the result of the fixed effect and random effect analyses alongside the result of the Hausman Test. The basis of the choice of the model upon which the hypotheses were tested was determined by the respective results of the Hausman test.

### Hypothesis One

**H<sub>01</sub>:** There is no significant relationship between return on equity and environmental cost disclosure among corporate entities in Nigeria.

Table 4

*Results of Model I and Test of Hypothesis I (ROE and ECD)*

Variables	Symbol	Std. Err	Coefficient	t-Statistics	P>(t)
Constant	_CONS	14.61279	12.48502	0.85	0.396
Env. Info Disclosure	ECD	328.5767	-2.056866	-0.01	0.995
Number of Obs				79	
F(3, 149)				0.00	
Prob> F				0.9950	
R-squared				0.0000	
Adj R-squared				-0.0130	

Source: Researcher's Computation via STATA 13.0

\* significant at 1% level; \*\* at 5% level

The results for the test of hypothesis one is presented in Table 4. As indicated in the table, the results of the Ordinary Least Square (OLS) test of the entire panel data were presented. A careful analysis of the results shows that environmental cost disclosure (ECD) obtained a

negative coefficients of about -2.056866. This is a suggestion that the explanatory variables (environmental cost disclosure) have negative relationship with return on equity (ROE). Also, ECD obtained a t-stat. of -0.01 ( $P > |t| = 0.000$ ), which further suggests that on individual basis; environmental cost disclosure has positive significant relationship with return on equity (ROE) environmental cost disclosure of Nigerian listed firms. Additionally, the result produced high standard errors for the explanatory variable ( $ECD = 328.5767$ ). It is worthy of note, that the levels of standard errors are reveals the level of precision and reliability of specified models in regression analysis. In accordance with the result, high standard errors are evidence of low level of precision in the model estimations. Thus, with 328.6as standard errors for ECD in the result of the OLS, it suffices therefore to assert that the predictions and estimations by the variables in the test of hypothesis one obtained a precision level of about 99.997%.

However, we observed that the p-value obtained is 0.9950. The R-squared obtained is 0.0000 and the Adj R-squared obtained is -0.0130, this indicates that environmental cost disclosure (ECD) account for about 0% – -0.13% changes in return on equity of listed companies in Nigeria. From the results presented in Table 4, judging by the result of the OLS, the p-value obtained which is (0.9950) is greater than 0.05 and insignificant at 5% level of significance implies that the null hypothesis which states there is no significant relationship between return on equity and environmental cost disclosure of listed firms in Nigeria is accepted.

## Hypothesis Two

H<sub>02</sub>: There is no significant relationship between net profit margin and environmental cost disclosure among corporate entities in Nigeria.

Table 5

*Results of Model II and Test of Hypothesis II (NPM and ECD)*

Variables	Symbol	Std. Err	Coefficient	t-Statistics	P>(t)
Constant	_CONS	78.95065	50.40585	0.64	0.525
Env. Info Disclosure	ECD	1775.249	-386.3929	-0.22	0.828
Number of Obs				79	
F(3, 149)				0.05	
Prob> F				0.8283	
R-squared				0.0006	
Adj R-squared				-0.0124	

Source: Researcher's Computation via STATA 13.0

\* significant at 1% level; \*\* at 5% level

The results for the test of hypothesis two is presented in Table 5. As indicated in the table, the results of the Ordinary Least Square (OLS) of the entire panel data were presented. A careful analysis of the results shows that environmental cost disclosure (ECD) obtained negative coefficients of about -386.3929. This is a suggestion that the explanatory variable environmental cost disclosure (ECD) has negative relationship with net profit margin (NPM). Also, environmental cost disclosure (ECD) obtained a t-stat. of -0.22 ( $P > |t| = 0.828$ ), which further suggests that on individual basis; environmental cost disclosure (ECD) has negative insignificant relationship with net profit margin of Nigerian listed firms.

Additionally, the result produced high standard errors for the explanatory variable ( $ECD = 1775.249$ ). Thus, with 1775.249as standard error for ECD in the result of the OLS, it suffices therefore to assert that the predictions and estimations by the variables in the test of hypothesis two obtained a precision level of about 99.9993%. However, when environmental cost

disclosure(ECD) is held against net profit margin (NPM) without any control variable, we observed that the p-value obtained is 0.8283. The R-squared obtained is 0.0006 and the Adj R-squared obtained is -0.0124, this indicates that ECD account for about 0.6% – 0.4% changes in net profit margin of listed companies in Nigeria. From the results presented in Table 5, judging by the result of the OLS, the p-value obtained is (0.05) which met and did not exceed the actual 5% (0.05) and insignificant at 5% level of significance implies that the null hypothesis which states net profit margin does not influence environmental cost disclosure of listed firms in Nigeria is rejected. We therefore conclude net profit margin does influence environmental cost disclosure of listed firms in Nigeria.

### Hypothesis Three

H<sub>03</sub>: There is no significant relationship between earnings per share and environmental cost disclosure among corporate entities in Nigeria.

Table 6

*Results of Model III and Test of Hypothesis III (EPS and ECD)*

Variables	Symbol	Std. Err	Coefficient	t-Statistics	P>(t)
Constant	_CONS	1.046895	6.002464	5.73	0.000
Env. Info Disclosure	ECD	23.54001	-43.60371	-1.85	0.068
Number of Obs				79	
F(3, 149)				3.43	
Prob> F				0.0678	
R-squared				0.0427	
Adj R-squared				0.0302	

Source: Researcher's Computation via STATA 13.0

\* significant at 1% level; \*\* at 5% level

The results for the test of hypothesis three of this current study is presented in Table 6. As indicated in the table, the results of the Ordinary Least Square (OLS) of the entire panel data were presented. A careful analysis of the results shows that environmental cost disclosure(ECD) obtained negative coefficients of about -43.6. This is a suggestion that the explanatory variable environmental cost disclosure(ECD) has negative relationship with earnings per share (EPS). Also, environmental cost disclosure(ECD) obtained a t-stat. of -1.85 ( $P > |t| = 0.068$ ), which further suggests that on individual basis; environmental cost disclosure(ECD) has negative significant relationship with earnings per share (EPS) of Nigerian listed firms. Additionally, the result produced high standard errors for the explanatory variables (= 23.54001). Thus, with 23.5 as standard errors for ECD in the result of the OLS, it suffices therefore to assert that the predictions and estimations by the variables in the test of hypothesis three obtained a precision level of about 99.999%.

However, we observed that the p-value obtained for environmental cost disclosure (ECD) is 0.0678. The R-squared obtained is 0.0427 and the Adj R-squared obtained is 0.0302, this indicates that environmental cost disclosure (ECD) account for about 0.05% – 0.03% changes in earnings per share of listed companies in Nigeria.

From the results presented in Table 6, judging by the result of the OLS, the p-value obtained which is (0.0678) is greater than 0.05 and insignificant at 5% level of significance implies that the null hypothesis which states that there is no significant relationship between earnings per share and environmental cost disclosure among corporate entities in Nigeria is retained.

## CONCLUSIONS/RECOMMENDATIONS

Arising from the research findings, we can conclude that return on equity (ROE) have negative and significant effect on environmental cost disclosure of firms, net profit margin (NPM) has a positive relationship with environmental cost disclosure among listed firms and earnings per share (EPS) have no significant effect on environmental cost disclosure among listed oil and gas firms in Nigeria. It is therefore recommended that: Firms should ensure efficient management of environmental conservation costs in order to enhance their profitability. Equally, there is the need for listed firms in the oil industry to adopt uniform reporting and disclosure standards of environmental issues for the purpose of control and measurement of performance. Lastly, Government can use its regulatory agencies to create more awareness about environmental issue while creating incentives that will encourage environmental disclosure by these firms.

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