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Effect of environmental costs on the financial performance of listed oil and gas companies in Nigeria

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ABSTRACT

The purpose of this study is to examine the effect of environmental costs on the financial performance of listed oil and gas companies in Nigeria. The ex-post facto research design was employed for the collection of financial statements of four listed oil and gas companies in Nigeria for a ten-year period from 2010 to 2019. The purposive sampling technique was used for the study. The Panel Ordinary Least Square of the multiple regression model was conducted using the E-views version 9.0 statistical software package. The findings revealed that staff development costs have a negative but insignificant effect on listed Nigerian oil and gas companies' return on assets, while community development costs and employee health and safety costs have a positive but insignificant effect. This implies that the amounts of these costs incurred by the studied companies are too small to have an impact on their performance metrics. However, studies are based on the quantity of information provided by a small number of companies, and as a result, these studies may be influenced by the costs that these companies incur as well as the extent to which they report those costs. The study is limited to only the oil and gas sector and some specific environmental cost variables. The utilization of environmental cost variables and the use of financial performance. The contribution of this study will be to help create a well-articulated employee health and safety cost system in order to provide the conflict-free working environment that managers and employees need for maximum productivity.

1. INTRODUCTION

Environmental accounting has recently developed into a significant area of accounting due to the severity of environmental damage and the growing concern among stakeholders. Environmental accounting is not often recognized or given much consideration in some parts of Africa, like Nigeria. Ifurueze, Lyndon, and Bingilar (2013) mentioned that businesses are turning their attention to environmental expenses because of rising environmental awareness around the world and the need for sustainable economic development. They go on to say that environmental expenditures have been increased to include worker training, research and development, recycling, and disassembly in addition to product sustainability and process design that minimizes the environmental impact of operations. Agbo, Ohaegbu, and Akubuilo (2017) continued that environmental reporting, sustainable development reporting, and social responsibility are all broadly accepted. An excellent and efficient technique to comprehend environmental performance and environmental hazards for institutions, local governments, and citizens is through protection reporting. Ndukwe and John (2015) said that increased worldwide awareness has dramatically altered society's expectations for business structure and performance evaluation. They added to the widely held notion that a company solely exists to enhance shareholder value and should only report on items that can be quantified in order to comply with legal requirements (accounting standards or listing rules). Okafor (2018) mentioned that sustainable development emphasizes the generation of wealth and prosperity while taking into account the genuine significance of social and environmental factors, enabling corporate and governmental organizations to reach the triple bottom line in sustainable management. Nwanwu (2022) described that environmental activities of the firm can cause possible avoidance of environmental influence, which includes pollution costs, waste disposal costs, drainage costs, and regulation compliance costs that need protection through environmental policies. Musa, Peter, and Bukar (2015) continued that environmental accounting is a broad subject of accounting that provides reports for both internal usage and the generation of environmental information to aid in management decision-making over pricing. The public and the financial community are interested in environmental disclosure because it helps control overhead, capital budgeting, and external use. Chiamogu & Okoye (2020) reviewed that many cost changes that affect the environment by causing damages had not

been taken into consideration by the decision-makers of the firms, which in turn reduced profit generation and people's welfare. Sergio and Carmen-Pilar (2017) added that minimizing environmental harm brought on by business activity and protecting the natural environment are signs of a firm's environmental performance and have drawn increasing attention from the public, who want businesses to lessen their adverse effects on the environment to support sustainable development. Businesses can also create environmentally friendly products that have a smaller environmental impact by reducing or eliminating the production of waste and pollutants during and after the production process. This will result in businesses using fewer natural resources and energy and producing less waste and pollution. Environmental management systems (EMS) have arisen as a way to systematically apply business management to environmental expenditures in order to improve a firm's long-term financial performance (Nwaiwu and Oluka, 2018).

1.1 Statement of the Problem

Environmental protection has now become a global issue, and managers have to focus their attention on creating biodegradable products that can be recycled. However, within the developing nations, the understanding is somewhat different, mainly because of weak government regulations and a lack of organized pressure groups and consumer awareness to influence corporate behavior (Okafor, 2018). Environmental expenditures in terms of effective cost reduction are a highly viable approach toward enhancing profitability. Thus, environmental costs provide a framework for environmental responsibility and corporate financial performance. The extent to which environmental costs influence the financial performance of firms is determined by some variables such as community development costs, environmental taxes and fines, training costs, recruitment costs, and canteen costs (Nwaiwu and Oluka, 2018). It is based on these problems that this study is intended to look into the effect of environmental costs on financial performance at listed oil and gas companies in Nigeria.

1.2 Objective of the study

The main objective of the study is to investigate the effect of environmental costs on the financial performance of listed oil and gas companies in Nigeria.

The specific objectives are:

- To determine the effect of community development costs on the return on assets of listed oil and gas companies in Nigeria.
- To examine the effect of employee health and safety costs on the return on assets of listed oil and gas companies in Nigeria.
- To ascertain the effect of staff development costs on the return on assets of listed oil and gas companies in Nigeria.

1.3 Statement of Hypotheses

Based on the specific objectives, the null hypotheses were formulated for the study.

H_{o1}: There is no significant effect of community development costs on the return on assets of listed oil and gas companies in Nigeria.

H_{o2}: Employee health and safety costs have no significant effect on the return on assets of listed oil and gas companies in Nigeria.

H_{o3}: Staff development costs have no significant effect on the return on assets of listed oil and gas companies in Nigeria.

2. LITERATURE REVIEW

2.1 Environmental Cost

Raymond et al. (2016) defined environmental cost as environmental accounting that identifies and quantifies the costs of environmental goods and services as well as data that is utilized to make environmental management decisions. Environmental expenditures, they said, are expenses related to the development, identification, remediation, and prevention of environmental damage. Okafor (2018) referred to "environmental cost as the environmental accounting principles of an account that aspired to achieve sustainable development, maintain a positive relationship with the community, and pursue successful environmental conservation actions. The researcher went on to say that this kind of accounting enables a business to determine the cost of environmental protection while conducting its regular business operations, discover the benefits and gains from such activities, and provide the best tools for quantitative measurement and communication of the results. Environmental accounting is described as a comprehensive topic in accounting by Musa et al. (2015). They go on to say that environmental accounting offers reports for both internal and external uses, providing environmental information that the general public and the financial community may find interesting and useful in making decisions about pricing, controlling overhead, and capital budgeting.

Ofoegbu and Megbuluba (2016) stated that expenditures associated with causing, learning about, treating, and avoiding environmental degradation are environmental costs. They further mentioned that it helps to ensure that environmental sustainability is a core component of every corporate culture. Ifurueze et al. (2013) described environmental costs as having been expanded to include factors such as worker training, research and development, recycling, and product design for sustainability. The authors go on to say that environmental management systems (EMS) have developed as a way to systematically apply business management to environmental costs in order to improve a firm's long-term financial performance by creating procedures and goods that boost both competitive and environmental performance. They went on to say that using environmental expenses as a way to reduce organizational costs effectively is a very realistic strategy for providing managerial rationale for spending on environmental management systems (EMS). Nwaiwu and Oluka (2018) described environmental expenses as environmental measurements and environmental losses, such as clean-up expenses, costs associated with resource recycling or energy conservation, closure costs, capital expenditures, and development expenditures. They continued by saying that environmental expenses result from operations that affect the environment and its consumers. There is also widespread worry that environmental costs limit operating flexibility and lower business output.

According to Onipe (2018), environmental accounting is also referred to as "green accounting," which has to do with the present generation's capacity to meet its demands without necessarily compromising or impeding the ability of future generations to do the same. He continued by stating that it is an art or science to assess organizational performance in relation to the objective, disclose it to internal and external stakeholders, and be responsible for its sustainable development. According to Norhasimah et al. (2016), environmental accounting can help communities preserve their relationships with one another while also achieving sustainable growth and development. They go on to say that it is an essential component of accounting that is growing and developing because societal forms are becoming more environmentally conscious, which raises the bar for monitoring the environment. They continued by

pointing out that the International Organization for Standardization (IOS) had introduced the IOS 14,000 series of standards, which cover a variety of environmental management-related topics. This gave businesses useful tools to improve their environmental performance, which in turn increased productivity and success.

2.2 Return on Assets (ROA)

A financial ratio called return on assets (ROA) displays the proportion of profit an organization makes in comparison to its total resources. The usual definition of it is net income divided by total assets. Net income, which is the company's profit after taxes, is obtained from the income statement or statement of comprehensive income (Enekwe et al., 2014). It is stated as:

$$\frac{\text{Profit before tax}}{\text{Total Assets}}$$

2.3 Theoretical Review

The researchers review the following theories in connection with this study:

2.3.1 Stakeholder Theory

Stakeholder theory emphasizes the many stakeholder groups within society while viewing corporations as a component of a social system. Companies identify stakeholders to determine which groups need to be controlled to advance the interests of the firm (Raymond et al., 2016). According to stakeholder theory, businesses will manage these connections based on a variety of variables, including the work environment, the importance of different stakeholder groups, and the values of the decision-makers who decide how to prioritize shareholders. Musa et al. (2015) stated that the stakeholder hypothesis argues that the company interacts with several environmental agents and the Stakeholders include, among others, the government, employers' trade associations, political parties, customers, communities, and suppliers. Influence is shared in a two-way fashion between the business and its stakeholders, as well as the other way around. Stakeholders are defined as any recognized group or individual who can influence or be impacted by the achievement of an organization's purpose. The policy perspective of stakeholder theory treats all of the company's stakeholders equally and disregards their varying degrees of influence. Stakeholder theory's normative stance exhorts managers to work for the interests of all stakeholders. In terms of the managerial perspective of stakeholder theory, it considers the interests of a small group of interested parties who have a considerable amount of control over the organization. The types of important resources that stakeholders possess determine the power of the company. The theory backs up the notion that management is encouraged to align company needs with their environment by the behavior of various stakeholder groups (Uwuigbe & Olayinka, 2011). The managerial branch of stakeholder theory offers a framework for an organization-centered analysis of CSED. It is debatable whether or not organizational legitimacy exists when stakeholders are managed effectively through the exercise of responsibility using CSED.

2.3.2 Legitimacy Theory

Ofoegbu and Megbuluba (2016) mention that the theory supports the idea that businesses change their reporting practices to demonstrate that their operations are in line with societal values and expectations. Because there is a common social compact between businesses and society, legitimacy theory also creates an incentive for corporate environmental reporting. According to Daniel & Ambrose (2013), the legitimacy hypothesis formed the basis for the claim that pressure from stakeholders over time led to an increase in environmental disclosures and reporting. By disseminating environmental information, the business demonstrates its legitimacy in the eyes of the public, which is necessary for the firm to justify its existence in the eyes of society. Therefore, the legitimacy hypothesis postulates that by making enough social and environmental disclosures, the entity aims to boost its reputation generally and ultimately justify its continued existence. According to this theory, businesses can utilize CSED (communication medium) as a tool to disclose details about their operations and procedures in order to meet societal expectations and keep their right to function in society (Waris & Muhammed, 2013).

2.3.3 Institutional Theory

Chowdhury and Hamid (2013) stated that institutional theory explains how certain organizational practices from inside a particular organizational area are adapted. Isomorphism and decoupling, two aspects of institutional theory, explain why voluntary social and environmental disclosure was adopted. They added that the stakeholders' thesis, which forms the foundation of this study, claims that people whose relationships

to the enterprise cannot be fully negotiated for but whose collaboration and innovation it needs for its existence and prosperity are considered stakeholders. They continued that stakeholder theory uses a stakeholder-agency perspective to explain specific corporate behaviors and activities. It is concerned with how interactions with stakeholders are managed by businesses in terms of their recognition of the society in which they operate.

2.3.4 Resource Dependence Theory

Shedu (2011) explained that resource dependence theory is concerned with how organizations use the environment to obtain resources. Because organizations depend on both them and the environment, this perspective is crucial. Stakeholder theory focuses on how organizations resolve the many and sometimes contradictory expectations of various stakeholders. Due to the varied effects that many stakeholders have on organizations, this is more important. Cost-benefit analysis (CBA) is a method for comparing all the costs and advantages associated with various courses of action. Many believe that the cost-benefit analysis paradigm can be used to assess all environmental resources and environmental choices more accurately. For example, it will be necessary to offer estimates of all costs and benefits associated with carrying out the steps necessary to preserve the endangered species.

However, the researchers anchored this study on both stakeholder theory and legitimacy theory because they are more connected to environmental costs on financial performance than other theories mentioned in this study.

2.4 Empirical Review

Okafor (2018) studied Using a study of publicly traded Nigerian oil companies, environmental expense accounting and reporting on business financial performance Ex-post facto research design and secondary data were employed in the study. Accounting for and reporting on environmental costs is an independent variable, whereas business financial performance is a dependent variable. The dependent variable was proxied by return on assets, whereas the independent variables were the cost of environmental remediation and pollution control, the cost of environmental law compliance and penalties, and the cost of donations and charity contributions. An analysis of financial records from oil and gas businesses listed on the Nigerian Stock Exchange from 2006 to 2015 was conducted. The statistical program for social sciences (SPSS) was used to conduct the analysis, which included the use of regression analysis. The statistical analysis's findings indicated that environmental remediation and pollution control have a positive but negligible impact on the return on assets of Nigeria's listed oil and gas companies, whereas compliance with environmental laws, penalties, donations, and charitable contributions have a significant positive effect. Norhasmimah et al. (2016) examined the effect of environmental disclosure on Malaysian financial performance. Ex-post facto research design and secondary data were employed in the study. Financial performance is the dependent variable, with environmental disclosure acting as the independent variable. Total environmental disclosure (TED) served as a proxy for the independent variable, whereas return on assets (ROA), return on equity (ROE), earnings per share (EPS), and profit margin served as proxies for the dependent variable. Non-probability sampling approaches, such as convenience and purposeful sampling, were used in this investigation. Ten (10) companies' annual reports were chosen at random as the sample size for this investigation. 2011 was the research study year, and annual reports were gathered. For this study, the researchers conducted multiple regression analysis as well as correlation (Spearman's rho). The analyses for this study were carried out using the SPSS program. The result indicated that total environmental disclosure (TED) has a significant negative impact on return on equity (ROE), a major positive impact on earnings per share (EPS), and a significant negative impact on profit margin (PM) of Malaysian listed companies.

Raymond et al. (2016) investigated how Nigerian corporate organizations' financial performance is affected by sustainability and environmental cost accounting. Financial success is a dependent variable, while sustainability and environmental cost accounting are independent variables. Environmental cost served as the independent variable's benchmark, while income and profit served as the dependent variable's benchmark. Time series data and the ex post facto study design were used. The financial reports for the years 2009 to 2013 were used by the researchers. For this investigation, the simple sampling method was employed. The analysis for the study was carried out using the statistical package for social sciences (SPSS) version 20 software. The study also made use of linear regression. The result revealed that environmental costs

have a favorable considerable impact on revenue and a favorable small impact on profit for Nigerian corporate organizations. In the research of Musa et al. (2015) on the environmental accounting disclosure practices of Nigerian quoted firms using a case study of some selected quoted consumer goods companies, the study used secondary data and an ex-post facto research design. The study selected only eight (8) quoted companies out of nineteen (19) consumer goods companies listed on the Nigerian Stock Exchange. The annual reports for the eight (8) companies were collected and analyzed using one-way analysis of variance to test the hypothesis. The result indicates that accounting standards do not significantly influence the environmental accounting disclosures of selected consumer goods companies.

Ofoegbu and Megbuluba (2016) looked at the disclosure of corporate environmental accounting information by industrial companies in Nigeria. They looked at how firm factors influenced how well Nigerian manufacturing enterprises disclosed corporate environmental accounting information. The size and financial performance of the firm served as proxies for the firm's characteristics, and the corporate environmental accounting information disclosure served as the dependent variable. In addition to using the judgmental sample technique, the ex-post facto research design was employed to choose the 10 (ten) Nigerian manufacturing industries that were mentioned. Panel data were gathered for the study during a seven-year period, from 2008 to 2014. The influence of the independent variables on the dependent variable was calculated using the pooled panel data least squares regression model. The results strongly showed that firm financial performance has a significant impact on the quality of CEAID, but firm size has no impact on the quality of CEAID.

Ifurueze et al. (2013) investigated a study of oil businesses in Nigeria's Niger Delta States to examine the effect of environmental costs on corporate performance. For this investigation, secondary data were employed. Community development costs (CDC), waste management costs (WMC), and employee health and safety costs (EHSC) were used as proxies for the environmental cost as an independent variable, and return on total assets (ROTA) was used as a proxy for business performance as a dependent variable (ROTA). Twelve (12) Nigerian oil companies with publicly traded stock were the sources of the data for this study. For the eleven (11) years from 2001 to 2011, the annual reports or financial statements of the twelve (12) oil firms were gathered. The analysis for this study was conducted using SPSS version 19 and multiple regression analysis. The findings showed that employee health and safety costs (EHSC) have a positive and significant effect on the return on total assets (ROTA) of oil companies in the Niger Delta States of Nigeria, while community development costs (CDC) and waste management costs (WMC) have a negative and insignificant effect on ROTA.

Nwaiwu and Oluka (2018) studied the financial performance of Nigerian oil and gas corporations and environmental cost transparency. For this study, secondary data were employed, and a causal comparative research design was used in the methodology. This study also made use of time series data. Waste management costs (WMC), pollution abatement costs (PAC), and rules and regulations (LR) are used as independent variables in the environmental cost disclosure, while earnings per share (EPS) is used as a proxy for financial performanceology. This study also made use of time series data. Waste management costs (WMC), pollution abatement costs (PAC), and rules and regulations (LR) are used as independent variables in the environmental cost disclosure, while earnings per share (EPS) is used as a proxy for financial performance. The Pearson product was used to examine the data that was gathered. Moment correlation coefficient and multiple regression analysis were performed using SPSS version 24 for the social sciences. The findings show that environmental cost disclosure policies have a positive and noteworthy impact on the financial performance of Nigerian oil and gas businesses. Agbo et al. (2017) looked into how Nigerian Brewery's financial performance was impacted by environmental costs. For this investigation, secondary data were employed. The information was taken from the Nigerian Brewery's annual report for the five (5) years between 2011 and 2015. Financial success as a dependent variable was proxied by return on assets, while environmental cost as an independent variable was proxied by donations, medical costs, training costs, recruitment costs, and canteen costs (ROA). The analysis for this study used multiple regression. The analysis was carried out utilizing the SPSS version 22 software suite. The findings indicate that medical expenses (ME) and donations (DN) have a negative, minor impact on the Nigerian Brewery's return on assets (ROE), whereas training, recruitment, and canteen expenses (TRC) have a positive, insignificant impact on ROA.

Nwaimo (2020) looked into how quoted enterprises' performance was impacted by environmental costs in Sub-Saharan Africa (2007–2016). As substitutes for environmental costs (an independent variable), the study included employee health and safety, waste management, and community development costs. Return on capital employed, earnings per share, and return on equity were used as substitutes for performance (dependent variables). Industrial enterprises on the stock exchanges in South Africa, Nigeria, Ghana, and Tanzania provided the data for this study. From 2007 through 2016, inclusive, the researcher used an ex-post facto study approach, random sampling, and quantitative secondary data. The Granger causality analysis for this study was conducted using panel data analysis and ordinary least squares (OLS) regression. The results indicate that employee health and safety, waste management, and community development expenses have no appreciable impact on a company's return on equity, earnings per share, or return on capital employed in Nigeria or South Africa, but they do in Tanzania. In Ghana, however, these have a sizable impact on these metrics. Okezie, Ibe, and Kanu (2019) examined the financial performance and environmental costs of Nigerian listed companies. The study divided financial performance, the dependent variable, into independent variables such as environmental costs and dependent variables such as earnings per share, dividend per share, net profit margin, and return on capital used. Data collection took place over a period of four (4) years, inclusive of the years 2014 and 2017, using the ex-post facto study approach. For the analysis, the multiple regression model was used. The findings show that there is very little correlation between environmental costs and the financial success of listed companies in Nigeria.

Oraka (2021) studied the environmental costs and financial performance of Nigerian oil and gas businesses. Environmental remediation expenses and compliance costs were used to measure the independent variable, environmental costs, while Tobin's Q was used to assess the dependent variable, financial performance. The financial statements of eleven (11) businesses were gathered for a period of twelve (12) years, from 2008 to 2019, both years included, using the ex-post facto research design. Statistical software called E-Views 9.0 was used to implement the regression analysis. The outcome demonstrates that environmental remediation costs and compliance costs have a considerable impact on the Tobin's Q of oil and gas businesses in Nigeria.

Chiamogu & Okoye (2020) adopted the ex-post facto research design for the impact of environmental costs on the financial performance of Nigerian oil and gas companies for an eleven (11) year period from 2008 to 2018, both years inclusive. The study used the purposive sampling technique for the selection of sample size and E-views version 9.0 statistic software for the running of the panel regression analysis. The environmental cost is an independent variable measured by community development cost (CDC) and environmental remediation cost (ERC), with two control variables as firm size (FSZ) and leverage (LEV), while financial performance is a dependent variable measured by Tobin's Q (TQ). The regression analysis results revealed that community development costs (CDC) and environmental remediation costs (ERC) have a positive and significant effect on Tobin's Q of listed oil and gas companies in Nigeria. Nwanwu (2022) evaluated the environmental management expenses and financial performance of Nigerian oil and gas firms for the period of nine (9) years from 2011 to 2018, both years inclusive. The explanatory research design of secondary data was used for the study. The linear regression model and e-views statistical software were also adopted for the study. The environmental management cost is an independent variable proxied by pollution cost (PC), while financial performance is a dependent variable proxied by net profit (NEP). The regression result indicated that pollution costs have a positive and significant impact on the net profit of Nigerian oil and gas firms.

Ekpose & Enidiok (2021) researched the influence of environmental costs on the financial performance of quoted Nigerian oil and gas firms for the period of eleven (11) years from 2009 to 2019, both years inclusive. The ex post facto research design, panel data, purposive sampling technique, and linear regression model were adopted for the study. The environmental cost is an independent variable measured by health-related costs (HRC), infrastructural development costs (IDC), and education program costs (EPC), while financial performance is a dependent variable measured by profit margin (PM). The SPSS version 20 statistical software was used for the analysis. The findings show that health-related costs (HRC) have a positive and significant influence on profit margin (PM), while infrastructural development costs (IDC) and education program costs (EPC) have a positive but insignificant influence on the profit margin (PM) of quoted Nigerian oil and gas firms. Lawrence & Bernard (2023) carried out research on the moderated regression analysis approach to environmental costs and financial performance of Nigerian industrial goods firms for the period of eleven (11) years from 2011 to 2020, both years inclusive. Environmental costs are independent variables proxied by waste management costs (WMC) and community development costs (CDC) with the moderated variable of firm size (FS), while financial performance is a dependent variable proxied by net profit margin (NPM). The ex-post facto research design and panel data were used for the data collection. The panel estimates of generalized least squares and unit root tests were analyzed using e-views statistical software. The regression result indicates that waste management costs (WMC) and community development costs (CDC) have a significant positive effect on net profit margin (NPM), while the moderated variable of firm size on both waste management costs (WMC) and community development costs (CDC) has a significant negative effect on the net profit margin (NPM) of the selected industrial goods firms in Nigeria.

3. MATERIALS AND METHODS

The *ex post facto* approach was used for this study's research design because it deals with past or existing occurrences that cannot be changed. The primary emphasis of this paper was on the thirteen (13) listed Nigerian oil and gas companies, which made up the majority of the study. Only four (4) of these thirteen (13) businesses were chosen for the study, though. The four (4) firms were chosen because neither the internet nor the Nigerian Exchange Group had any information on all the listed oil and gas companies in Nigeria. For the computation of the variables for the analysis from the 2010 to 2019 financial years, the financial statements of the four (4) companies chosen among the publicly traded oil and gas companies were gathered which included Conoil Nigeria Plc, Oando Plc (O & O Plc), MRS Oil Nigeria Plc, and Mobil Nigeria (11 Plc) Plc. Non-probability or purposive sampling, also known as convenient or accidental sampling, was utilized to select the oil and gas sector from the list above for the study (Onyekwelu, 2015). The pool panel data gathered over ten (10) years, encompassing four (4) businesses chosen among the listed oil and gas corporations in Nigeria, served as the basis for the econometric technique used. In order to determine the impact of the independent variable on the dependent variable, we aggregate the cross-sectional dimension of the entire variable included in the mode. A descriptive analysis was employed in the study to give thorough details about each pertinent variable and to describe pertinent features of the environmental costs. Also, in order to determine the impact of each independent variable on the dependent variable and to evaluate the combined or overall impact of independent variables (environmental costs) on the dependent variable (financial performance) of listed oil and gas companies in Nigeria, the regression analysis was also used for multiple regressions. The multiple regressions for this investigation were carried out by the researcher using E-Views 9.0 statistical software.

3.1 Model Specification

The model's specifications were made in a way that it answered the study's specific goals. Because of its straightforward computational process and the estimates, it produces, which have the best properties, including linearity, unbiasedness, minivariance, and mean square error estimation, ordinary least square (OLS) was chosen for this research project (Koutsoyianis, 2003). In carrying out this research work on the effect of environmental costs on the financial performance, we developed a compact form of our as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + U_t$$

Where:
Y = Dependent variable of company
X = Independent variable of company
β_0 = Intercept for X variable of i company
β_1 - β_3 = Coefficient for the independent variables X of companies, denoting the nature of the relationship with dependent variable Y (parameters)
U_t = Error term

Model
$$ROA_{ij} = f(CDC_{ij}, EHSC_{ij}, SDC_{ij}) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$
$$ROA_{ij} = \beta_0 + \beta_1 CDC_{ij} + \beta_2 EHSC_{ij} + \beta_3 SDC_{ij} + U_t \dots\dots\dots\dots\dots\dots (2)$$

ROA = Return on assets was measured by profit after tax divided by total assets; CDC = Community development costs was measured by medical, donations and charitable contributions incurred for the development of the host community; EHSC = Employee health and safety

costs measured by health safety, environmental expenses and security expenses incurred for the employees or administrative expenses of the company and SDC = Staff development cost measured by staff trainings or administrative expenses for the company.

4. RESULTS AND DISCUSSION

Table 1. Descriptive Statistics

	CDC	EHSC	SDC	ROA
Mean	3.237320	5.277680	1464.093	0.019813
Median	3.662000	5.163950	5.588550	0.023700
Maximum	5.562100	7.339100	58359.00	0.158400
Minimum	0.000000	0.000000	0.000000	-0.368400
Std. Dev.	1.779566	1.232375	9226.538	0.096234
Skewness	-0.920769	-1.745670	6.084870	-1.905335
Kurtosis	2.675282	9.454605	38.02564	8.398834
Jarque-Bera	5.827837	89.75231	2291.497	72.78102
Probability	0.054263	0.000000	0.000000	0.000000
Sum	129.4928	211.1072	58563.73	0.792500
Sum Sq. Dev.	123.5073	59.23116	3.32E+09	0.361178
Observations	40	40	40	40

Source: Authors' E-view 9.0 Output

The above descriptive statistics table reveals that community development costs (CDC) have the lowest mean value and staff development costs (SDC) have the greatest mean value. Furthermore, the low standard deviation of community development costs (CDC) suggests that it does not deviate significantly from the mean, in contrast to the relatively high standard deviation of staff development costs (SDC) substitution, which suggests that it does deviate significantly from its respective means, as shown by the squared deviation figures. The table also shows that the observed distributions for community development costs (CDC), employee health and safety costs (EHSC), and staff development costs (SDC) have skewness coefficients of -0.920769, -1.745670, and 6.084870 that, respectively, estimate the asymmetry of the distribution of time series data around its mean. Employee health and safety costs (EHSC) and staff development costs (SDC), which indicate how high or flat the distribution of series is, were 9.454605 and 38.02564, respectively, while community development costs (CDC) were 2.675282. The result implied that employee health and safety costs (EHSC) and staff development costs (SDC) were allocated properly, whereas community development costs (SDC) were distributed abnormally. This result was further supported by Jarque-Bera statistics, which found significant values of 0.000000 for employee health and safety costs (EHSC) and staff development costs (SDC), and 0.054263 for community development costs (CDC).

Table 2. Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CDC	0.009825	0.009803	1.002243	0.3262
EHSC	0.005099	0.013746	0.370949	0.7139
SDC	-5.51E-07	1.42E-06	-0.387789	0.7016
C	-0.038100	0.096853	-0.393379	0.6975
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.694811	Mean dependent var		0.019812
Adjusted R-squared	0.504068	S.D. dependent var		0.096234
S.E. of regression	0.067770	Akaike info criterion		-2.256212
Sum squared resid	0.110227	Schwarz criterion		-1.580660
Log likelihood	61.12424	Hannan-Quinn criter.		-2.011954
F-statistic	3.642659	Durbin-Watson stat		1.765444
Prob(F-statistic)	0.002392			

Source: Authors' E-view 9.0 Output
Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/25/21 Time: 19:52
Sample: 2010 2019
Periods included: 10
Cross-sections included: 4
Total panel (balanced) observations: 40

The aforementioned regression analysis demonstrates that 69.48% of variations in return on assets (ROA) of listed oil and gas companies in Nigeria were caused by the level of community development costs (CDC), employee health and safety costs (EHSC), and staff development costs (SDC), while 30.52% of variations in return on assets (ROA) were influenced by other factors outside of our model. The adjusted R-Squared, which displays a number larger than 50%, suggests that the three main determinants of return on assets (ROA) of listed oil and gas companies in Nigeria were community development costs (CDC), employee health and safety costs (EHSC), and staff development costs (SDC). The F-statistic is 3.642659, and the P-value for the Durbin-Watson statistic is 0.002392. The regression analysis table above shows that the level of significance is 0.3262 and that the t-calculated community development costs (CDC) are 1.002243 less than the crucial value of 2.0000. This suggests that community development costs (CDC) have a positive and insignificant effect on return on assets (ROA). Since there is no discernible relationship between community development costs (CDC) and return on assets (ROA) of listed oil and gas companies in Nigeria, the researcher rejects the alternative hypothesis (Hi) and accepts the null hypothesis (Ho) of hypothesis one. Therefore, there is no significant effect of community development costs (CDC) on the return on assets (ROA) of listed oil and gas companies in Nigeria. The study's findings were consistent with those of Raymond et al. (2016), Nwaimo (2020) and Ekpoese & Enidiok (2021), which contrasted with the findings of Chiamogu & Okoye (2020). The study suggested that management should become more involved in community development initiatives that will benefit the host communities, as this will help boost the profitability of their companies' financial performance.

Additionally, the employee health and safety costs (EHSC) t-calculated value are 0.370949 less than the critical value of 2.0000 in the regression analysis table above, and the P-value indicates a value of 0.7139 greater than 5%, which is the threshold of significance. This suggests that employee health and safety costs (EHSC) have a positive and insignificant effect on return on assets (ROA). Employee health and safety costs (EHSC) have no significant effect on the return on assets (ROA) of listed oil and gas companies in Nigeria, according to the null hypothesis (Ho) of hypothesis two, which the researcher accepts in place of the alternate hypothesis (Hi). Therefore, the return on assets (ROA) of listed oil and gas companies in Nigeria is not primarily influenced by employee health and safety costs (EHSC). The study's findings were consistent with those of Nwaimo (2020), which contrasted with the findings of Ifurueze et al. (2013) and Ekpoese & Enidiok (2021). The study also suggested that to ensure the conflict-free workplace environment that managers and employees require for maximum productivity, management should design a well-articulated employee health and safety system in order to help motivate the staff to stay safe at all times in the work environment.

The staff development costs (SDC) t-calculated value shows a value of -0.387789 less than 2.0000, and the P-value shows a level of significance of 0.7016 more than 5%. This indicates that staff development costs (SDC) have a negative and insignificant effect on return on assets (ROA). The researcher therefore accepts the null hypothesis (Ho) of hypothesis three, which states that staff development costs (SDC) have no significant effect on the return on assets (ROA) of listed oil and gas companies in Nigeria. This is because the researcher rejects the alternative hypothesis (Hi) and accepts the null hypothesis (Ho). Therefore, the main determinant of return on assets (ROA) for listed oil and gas companies in Nigeria is not staff development costs (SDC). The result of the study was in line with the findings of Norhasmimah et al. (2016) and Ekpoese & Enidiok (2021), and against the result of Okafor (2018). The study further suggested that environmental regulatory agencies ought to put more effort into making sure that staff development expenses are documented separately and individually for effective reporting and transparency, which in turn will help in the improvement of the firm's profitability, which is the main target goal for all businesses. The three independent variables used in this study—costs associated with community development, employee health and safety, and staff development—indicate that these three variables are not the primary determinants of return on assets (ROA) for listed oil and gas companies in Nigeria. As a result, the test output in the table above that corresponds to the outcomes and the emerging multiple regression equation is as follows:

$$(ROA)_{yt} = -0.038100 + 0.009825(CDC)_{yt} + 0.005099(EHSC)_{yt} - 5.51E\text{-}07(SDC)_{yt} + \sum i$$

5. CONCLUSION

The researchers came to the conclusion that the impact of community development costs (CDC) and employee health and safety costs

(EHSC) has a positive but insignificant effect on the return on assets (ROA) of listed oil and gas companies in Nigeria which implies that any unit increases in community development costs (CDC) and employee health and safety costs (EHSC) will result to a unit increase in the financial performance of the firm's profitability and vice versa while staff development costs (SDC) have a negative but insignificant effect on the return on assets (ROA) of listed oil and gas companies in Nigeria which implies that any unit increase in staff development costs (SDC) will result to a unit decrease in the financial performance of the firm's profitability and vice versa. This suggests that the amounts of these costs incurred by the studied companies are too negligible to have an impact on their performance metrics. However, studies are based on the quantity of information provided by a small number of companies, and as a result, these studies may be influenced by the other costs that these companies incur as well as the extent to which they report those expenses in their financial statements.

Based on the specific findings of this study, the researchers recommended the followings:

- Management should increase their participation in community development cost issues to their host communities which will in turn improve the financial performance in their companies.
- Management should develop a well-articulated employee health and safety cost system to guarantee a conflict-free corporate atmosphere needed by managers and workers for maximum productivity.
- Environmental regulatory authority should be more committed to ensuring that staff development cost components are individually and separately disclosed for efficient reporting.

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