# ENVIRONMENTAL COSTS AND FINANCIAL PERFORMANCE IN NIGERIA'S SELECTED EXTRACTIVE INDUSTRY

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## ABSTRACT

The continued depletion of environmental resources in a bid to meet up with human needs coupled with the desire of every business entity to remain profitable has aroused the need to explore the right mix to balance the desire of all stakeholders. This study thus examined the effect of environmental cost on financial performance in the extractive industry in Nigeria. 18 companies listed on the Nigerian Stock Exchange were sampled for the study and secondary data from their annual financial reports for a period of 11 years (2010-2020) was collected and analyzed using panel regression estimation model. Findings from the result (R2 = 0.476728: F-statistic < 0.01) indicates that cost of Environmental variables like Environmental Remediation Cost, Administrative Cost has a positive effect on Financial performance, Business location Cost has a negative and highly significant effect on financial performance while Research and Development Cost and Social Cost has no effect on financial performance of selected sampled extractive industry in Nigeria. The study therefore concluded that Business location Cost exert negative and highly significant effect on financial performance while Research and Development Cost and Social Cost has no significant effect on financial performance of selected sampled extractive industry in Nigeria. Thus, it was recommended that extractive industry in Nigeria should be objective in their financial expenses so as to improve on their performance possibilities.

**Keywords**: Return on Equity, Environmental Cost, Financial Performance, Extractive Industry

## INTRODUCTION

Issues relating to the management of the environment has become of great concern to stakeholders to an extent that environmental accounting today is a major branch of accounting. The continued effort at sourcing for scarce natural resources as economic inputs, prevention, reduction and avoidance of environmental impact, removal of the impact if any, restoration in the case of disaster and the pollution of the environment is a

major subject of discussion for accountants, economic, social and political leaders throughout the world, therefore, accounting for the environment has become increasingly relevant to enterprises whether they are profit oriented, non-profit oriented or government corporations Gilbert, Anokye, Clement and George (2021). Environmental accounting is an important tool for understanding the role played by business enterprises in the economy towards the environmental management. It affords data that indicates the input of business to economic well-being and the cost imposed in the form of pollution or resource degradation (United Nations Conference on Trade and Development, 2002).

Environmental cost is described by Al-Mawali, (2021); Onyekachi, Ihendinihu and Azubike (2020) as well as Mieseigha and Ihenyen (2014) as the impact incurred by society, an organization or individual resulting from activities that affect the quality of the environment. They are the costs, direct or indirect, tangible or intangible with short or long run financial impact on an enterprise. These includes the cost of handling, treatment and disposal of waste and emissions as well as remediation and compensation cost; such as equipment depreciation, operational materials, water and energy, internal personnel, external services, fees, taxes and permits, fines and insurance (Shehu, 2014). It is further viewed to include the cost of complying with environmental laws and regulations. Additionally, Adagye and Abubakar (2018) stated that based on what is known of environmental degradation, environmental cost comprises of the amount spent on prevention of environmental dilapidation as well as the amount spent in restoring the environment to its original state before damage or a combination of both. The Japan Environmental Accounting Guidelines, (2005) categorized environmental cost to include the business area costs which is made up of the cost allocated for the control of environmental impact resulting from business activities within the business area. It also includes the administrative cost, research and development cost, social activities cost and the environmental remediation cost.

Firms experience rising pressure from both internal and external stakeholders to reduce their environmental impacts. External stakeholders, such as investors, financial analysts, regulatory bodies, host communities, government and her agencies as well as the public, increasingly take into consideration the environmental performance of the business firm and this puts pressure on companies to improve this performance (United Nations Division on Sustainable Development, 2000b). Furthermore, in addition to the external pressures, better environmental management can be driven by internal financial benefits. Therefore, environmental costs of companies, which includes the costs for monitoring, pollution reduction, waste management, regulatory reporting, legal fees and

insurance is of great importance to management (United Nations Division on Sustainable Development, 2000a). The experiences of many companies as recorded by Navarro and Vincenzo (2019) shows that there are many profitable options to avoid the costs for waste management, to reduce potential costs if environmental regulations become more stringent and also to position the company as environmentally friendly in the market.

In Nigeria, the extractive industry is one sector of the economy that has witnessed lots of public outcry on environmentally related issues. However, going by the fact that lots of the country's accrued revenue comes from the sector; there have not been many efforts to abase the situation. The extract industry is made up of firms that are involved in the extraction of raw materials from the earth to be used by consumers. The extractive industry consists of any operations that remove metals, mineral and aggregates from the earth, this includes oil and gas extraction, mining, dredging and quarrying. Perdeli, Smith, Duzgun and Waclawski (2021) viewed the extractive industries as having unacceptable impacts on the environment and that by their very nature; these industries use energy and disturb the land in extracting the resource being developed. Sustainable development of an extracted resource is a paradoxical concept. They further held that there appears to be an inherent, economically based conflict between the extraction of virgin materials and the reduction in the amount of use, reuse, or recycling of these same materials. Indeed, reduction, reuse, and recycling can be viewed as competitors to the extractive industries.

The extractive industry is renowned as having a substantial impact upon the population, both from the financial and from the socio-cultural and environmental point of view (Frunza, 2010). The United Nations Conference on Trade and Development (2002) defines the extractive industry as a process that involve different activities that lead to the extraction of raw materials from the earth (such as oil, metals, mineral and aggregates), processing and utilization by consumers. Nwaiwu and Oluka (2018) opined that Nigeria being a developing nation has massive degradation and destruction of environmental systems and natural resources which continually threatens sustainable development in a bid to remain a going concern. That is to say, whether investing in environmental conservation improves corporate performance which Jensen (2002) considers as the core objective of every firm. Hence it is against this background that this study is carried out to address the identified problems.

Statement of Problem

In the very recent past, the question of whether or not environmental performance is

associated with financial performance has been a long-standing debate among researchers as well as business societies. The question remains, how good for profit is going green? How much should corporate entities concern themselves about their environmental reputation and performance? Some researchers have postulated that going green costs more as design and systems change in a bid to be more environmentally friendly. However, others believe that the capital market and product/service market do appreciate green companies and green products/services, and therefore, environmental performance should have positive effects on financial performance

Prior empirical findings such as Ojiakor, Ezuwore and Ozioko (2018); Iheduru and Chukwuma (2019); Aggarwal (2013) have inconclusively narrowed down the effect of environmental costs on firm performances resulting to controversies by varied schools of thoughts on the relationship between environmental cost and financial performance using Return on Equity (ROE) as proxies for measuring performance. Horvathova (2010) additionally held that the inconclusive prior studies of the relationship between environmental performance and firm financial performance have led to conflicting results due to the three competing schools of thoughts that exist recently in the field: that investments in environmental conservation improves financial performance; the contrary that better spending on environmental performance does not improve financial performance and that which opined that there is no connection between environmental cost and financial performances. This forms a fundamental gap on which this study will be anchored.

Consequently, Nwaimo (2020) stated that there have been strong opinions between the proponents of negative effect (contemporary school of thought) and positive effect (classical school of thought) on aged dichotomy which have given birth to postulations on the effect of environmental costs on firm finances. The classical proponent viewed all costs (including environmental costs) as reduction in profits with consequential negative effect, therefore, the basis of cost reduction strategies. For them, all manner of costs (including environmental costs) is inversely related to firm performance (Amoako, Lord and Dixon, 2016). This is the bedrock of traditional accounting and reporting that also anchors cost minimization strategies and narrowed perspective on firm's financial performances. Therefore, the divergent opinions on the subject with shortcomings and variances of prior empirical studies have necessitated a study to offer some improvements and to establish the effect of environmental costs on firm's financial performances particularly in a developing country such as Nigeria. This study therefore analyzes and ascertain, if environmental cost by extractive companies in Nigeria has any

impact on the corporate financial performance of the companies.

## Research Hypothesis

Ho1: Environmental Cost does not have significant effect on Financial Performance of Extractive Industry in Nigeria

## Literature Review

### Environmental Cost

Corporate performance is no longer seen simply as a measure of profitability alone rather information on accounting for investment on environmental conservation is equally important. All categories of cost are to be considered as it arises so as to accord it the appropriate treatment in line with the international accounting principle of Generally Accepted Accounting Principle (GAAP) (Nwaiwu and Oluka, 2018). Environmental cost can be defined as the generation and analysis of both financial and non-financial information in order to support internal environmental conservation. Additionally, UNCTAD (2002) see environmental cost to comprise the costs steps taken or required to be taken, to manage environmental impacts of an enterprise activity in an environmentally responsible manner, as well as other costs driven by the environmental objectives and requirements of the enterprise. It is based on costs and its effect examination. It allocates to environmental exploitation entities the costs of their impacts on the environment (Mukah, 2021).

Environmental cost consists of environmental measures and environmental losses. They include cleanup cost, cost of recycling materials or conserving energy, closure cost, capital expenditure and development expenditure. These costs are incurred in preventing, reducing or repairing damage to the environment and conserving resources. However, environmental losses are costs, which bring no benefits to the business. Example of these includes fines, penalties, and compensation and disposal losses relating to assets which have to be scrapped because they impact negatively on the environment. It is the investment and expenses related to the prevention, reduction and avoidance of environmental impact, removal of such impact, restoration following the occurrence of disaster and other activities measured in monetary value.

### *Classification of Environmental Cost*

Environmental Cost can be categorized into the different business activities of a production entity. They are fixed into the Business Area Cost (BCA), Administrative Cost (AC), Research and Development Cost (RDC), Social Activities Cost (SAC) and the

Environmental Remediation Cost (ERC). This classification as indicated in Table 1 below creates a decision-oriented information base for environmental conservation and for planning, control and supervision of material and energy flow.

**Table 1: Classes of Environmental Cost Application**

| CATEGORIES | ENVIROENMENTAL COST CONTENT |
|---|---|
| **BAC** | Monetary investment to control environmental impacts which results from key business activities within the production location |
| **AC** | Monetary investment stemming from administrative activities in relation to environmental conservation |
| **RDC** | Monetary investment stemming from research and development activities in relation to environmental conservation |
| **ERC** | Cost incurred for dealing with environmental degradation |
| **SAC** | Environmental conservation cost stemming from social activities |

Source: Adapted from Japan Environmental Accounting Guideline, 2005

**Financial Performance**

Hansen and Mowen (2005) opined that a firm's performance is an outcome of the activities of such firm in relation to its authority and responsibility in achieving its set objectives through lawful, moral and ethical means of which are essential to the management. Furthermore, performance is the function of the ability of a firm to gain and manage the resources available through legal means to achieve competitive advantages. Measuring performance is therefore important as it builds on the results and helps make different decisions in economic units (Falope et al, 2019; Tochukwu 2018).

According to Benjalux (2006), performance measures are the life blood of economic units, since without them no decisions can be made. Financial Performance Measure is one of the important measures and determinant of performance. Financial performance measures are used as the indicators to evaluate the success of economic units in achieving stated strategies, objectives and critical success factors. Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity; ROE=(Net Income)/(Average Shareholders Equity)

## Empirical Review

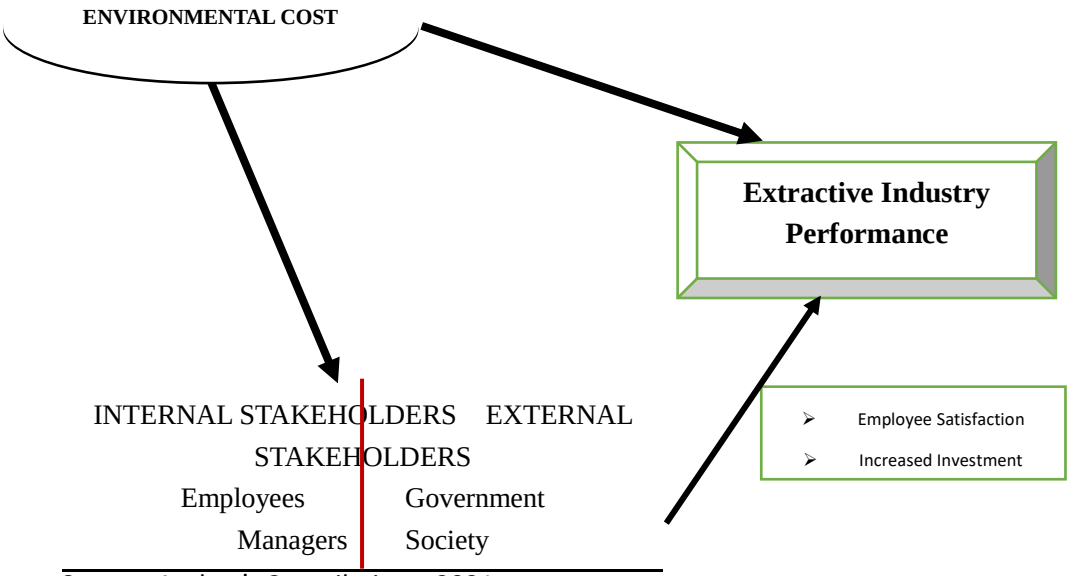
Studies within the domain of environmental accounting and environmental cost have received substantial interest from academics across developed and developing nations,

results of which measures corporate performance against environmental cost with varying output of result. This study therefore, reviewed considerable literatures from both local and international authors. Nwaiwu and Oluka (2018) conducted research to examine whether there is a significant relationship between environmental cost disclosure and financial performance of oil and gas companies in Nigeria. Time series data from 2011 to 2015 were collected from annual financial report of quoted oil and gas companies. The result showed that there exists positive and significant relationship between environmental cost disclosure and compliance to corporate environmental regulations on the financial performance of the review companies. Also, Ojiakor, Ezuwore and Ozioko (2018) in their study with the topic environmental cost disclosure in the financial statements of motor vehicle manufacturing firms in south east Nigeria held that the degree of environmental cost disclosure in the financial statements of these companies is dependent on profitability of the firm.

However, Agbo, Ohaegbu and Akubuilo (2004) in their research work titled the effect of environmental cost on financial performance of Nigerian Brewery made use of regression analysis and found that environmental cost has a negative relationship with financial performance. Also, Ahmed, Muhammed and Jubril (2017) considered environmental cost and corporate performance of oil and gas companies in Nigeria making use of panel data. The result of the study showed that environmental cost has a positive significant effect on the performance of listed oil and gas firms. Furthermore, Ngozi and Ike (2019) examined the effect of environmental and social costs on performance of manufacturing companies in Nigeria. Data were analyzed using multiple regression models, while findings of the study showed that there is significant negative relationship between Environmental and social costs and Return on Capital Employed (ROCE) and Earnings per share (EPS) and a significant positive relationship between environmental and social costs and Net Profit Margin (NPM) and Dividend per Share (DPS). Additionally, Taiwo and Owolabi (2019) examined the effect of environmental sustainability on corporate performance from shareholders perception. The study adopted ex-post facto and content analysis research design. The result of the study indicated that there is a positive relationship between environmental sustainability and corporate performance.

## Conceptual Model for the study

The construct of this study was embedded on Stakeholders' Theory




Source: Author's Compilations, 2021.

## METHODS

Quantitative research approach was employed. The 18 companies listed on the Nigerian Stock Exchange were sampled for the study and secondary data from their annual financial reports for a period of 11 years (2010-2020) was collected and analyzed using descriptive analysis like percentage, mean, and standard error while a panel regression estimation model was used to test the formulated hypothesis. The model specification was based on the theory that environmental costs correlate with financial performance, Acti et al. (2013); Karambu and Joseph (2016). The dependent variable of this study was financial performance proxied as Return on Equity (ROE).

$ROE\ (Y) = \beta_{\circ} + \beta_1 BAC + \beta_2 SC + \beta_3 ERC + \beta_4 AC + \beta_5 R\&DC + \varepsilon$

Where;

ROE = Return on Equity

$\beta_{\circ}$=Intercept

$\beta_{1-5}$= Coefficient of independent variables

BAC = Business Area Cost

AC = Administrative Cost

SC = Social Cost

ERC = Environmental Remediation Cost

R&DC = Research and Development Cost

ε=Error term (Assumed to be purely random)

The 'a priori' expectations are:

$\beta_1 > 0$; implying that the higher the BAC, the higher the Y.

$\beta_2 > 0$; implying that the higher the AC, the higher the Y.

$\beta_3 > 0$; implying that the higher the SC, the higher the Y.

$\beta_4 > 0$; implying that the higher the R&DC, the higher the Y.

$\beta_5 > 0$; implying that the higher the ERC, the higher the Y.

## RESULTS AND DISCUSSIONS

### Descriptive Statistics of Study variables

Based on this research study, the descriptive statistics presents the dependent variable as corporate performance proxied ROE while the independent variable Environmental Cost is proxied with Business Area Cost, Social Cost, Administrative Cost, Research and Development Cost and Environmental Remediation Cost in the extractive industry from the year 2010 to 2020 (a period of 11 years). This is in conformity with the works of Arumona, Lambe and Ogunmakinde (2020) which states that a period covering a total observation of 120 observations is adequate for a panel data regression analysis. The descriptive statistics shows estimates of the mean, standard deviations, skewness, kurtosis, and Jarque-Bera statistics of the study variables and the format of the descriptive statistics adopted is in line with existing empirical researchers such as Soewarno and Tjahjadi (2020). The descriptive statistics result is as presented in table 2 below. The result shows that Return on Equity is skewed to the left with leptokurtic distribution. The standard deviations of the variables are volatile and therefore of low predictive power. The Jarque-Bera statistics and associated probability values less than 0.05 (i.e., $p < 0.05$) indicates that the distribution of the variables is not normal. The analysis in table 2, further shows that Return on Equity (ROE) indicate a mean value of 7.433433 and a standard deviation of 142.7667 alongside a minimum and maximum values of -1572.240 and 872.2948 respectively. This implies that ROE witnessed some fluctuations during the study period, as the standard deviation is large compared to the mean, together with the wide range between the minimum and maximum values. The standard deviation values show the disparity in the dataset. The higher the value of the standard deviation, the wider the deviation of the dataset from its mean value. Equally, in the case of smaller value of the standard deviation compared to its corresponding mean value, the lesser the disparity. Kurtosis value measures the peakness and flatness of the distribution of a series of dataset. If Kurtosis value is less than 3, it means the distribution of the variable is normal, but when it is more than 3, the distribution of the variable is said to be abnormal. Variables with value of kurtosis less than three are called platykurtic (fat or short-tailed). On the other hand, variables whose kurtosis values are

greater than three are called leptokurtic (slim or long tailed). Hence, variables adopted in this study qualify for this during the study period.

**Table 2: Summary of Descriptive Statistics Model**

| | ROE | AC | BAC | ERC | SC |
|---|---|---|---|---|---|
| Mean | 7.433433 | 7786538. | 4628134. | 540782.4 | 8383355. |
| Median | 12.00040 | 900220.0 | 256950.0 | 17397.00 | 961.5000 |
| Maximum | 872.2048 | 2.72E+08 | 2.17E+08 | 34695999 | 3.12E+08 |
| Minimum | -1572.240 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| Std. Dev. | 142.7667 | 24078957 | 20248515 | 3607427. | 36533754 |
| Skewness | -6.202287 | 7.797541 | 7.975705 | 8.438084 | 5.643320 |
| Kurtosis | 87.54522 | 79.63168 | 75.77214 | 76.28424 | 39.22672 |
| | | | | | |
| Jarque-Bera | 57805.66 | 48415.34 | 43939.34 | 44771.80 | 11398.13 |
| Probability | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| | | | | | |
| Sum | 1412.352 | 1.48E+09 | 8.79E+08 | 1.03E+08 | 1.59E+09 |
| Sum Sq. Dev. | 3852263. | 1.10E+17 | 7.75E+16 | 2.46E+15 | 2.52E+17 |
| | | | | | |
| Observations | 190 | 190 | 190 | 190 | 190 |

Source: Author's E-View 10 Output Compilation (2021)

## Cross-Sectional Dependency Test

The study carried out a cross-sectional dependence test. The cross-sectional dependence testing is an important diagnostic which should be investigated prior to performing the panel analysis. The results are presented in Table 3 below, which clearly shows that the null hypothesis of no cross-sectional dependence (correlation) is rejected at 1% level of significance. The results are exhibited a strong cross-sectional dependence. Hence the need to proceed to determine the stationarity of the dataset.

**Table 3:** Cross-Sectional Dependence Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| | **Breusch–Pagan LM** | **Pesaran-scaled LM** | **Bias-corrected scaled LM** | **Pesaran CD** |
|---|---|---|---|---|
| **ROE** | 213.9390 (0.0000) | 3.48652 (0.0000) | 2.583652 (0.0000) | -0.225445 (0.0000) |
| **AC** | 293.2861 (0.0000) | 8.019625 (0.0000) | 7.119625 (0.0000) | 4.152974 (0.0000) |
| **BAC** | 266.0003 | 6.459799 | 5.559799 | 5.0306682 |

| | | | | |
|---|---|---|---|---|
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) |
| **SC** | 249.5384<br>(0.0000) | 5.518733<br>(0.0000) | 4.618733<br>(0.0000) | 2.270303<br>(0.0000) |

Note: Numbers in bracket are P-values

Source: Author's E-View Output Compilation (2021)

## Unit Root of Stationarity Test

Variables in a regression model are required to be stationary to ascertain the reliability of the result. Therefore, potential variables for a model have to be tested for stationarity before estimation. As the method involved for this model is panel data analysis, an appropriate panel unit root test (which is a test for stationarity) was carried out. Therefore, the Levin, Lin and Chu t* panel unit root test and Im, Pesaran and Shin unit root test were performed to ascertain the stationarity state of the dataset. The existence of a common unit root was rejected with 95% probability, implying stationarity of the data is used for analysis as depicted in Table 4.

**Table 4** Unit Root Test Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| Variables | Liven, Lin, and Chu | | Im, Pesaran, and Shin | |
|---|---|---|---|---|
| | Intercept | Intercept with Trend | Intercept | Intercept with Trend |
| | | | | |
| ROE | 5.50633 | 6.43210 | 3.41858 | 1.77373 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | | | |
| AC | 12.1059 | 6.02635 | 4.99129 | 1.48154 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0692 |
| | | | | |
| BAC | 8.16582 | 7.42646 | 4.39550 | 1.77823 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0377 |
| | | | | |
| ERC | 1.46513 | 0.18907 | 1.4034 | 0.98208 |
| | 0.9286 | 0.4250 | 0.9198 | 0.8370 |
| | | | | |
| SC | 1691.73 | 1896.13 | 413.156 | 311.190 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Source: Author's E-View 10 Output Compilation (2021)

## Pooled Regression Test

Table 5 showed the effect of environmental cost proxied with Administrative Cost, Business Area Cost, Environmental Remediation Cost, Research and Developmental Cost as well as Social Cost on Corporate Performance (proxied with Return on Equity) in the extractive industry in Nigeria. The result revealed that 11% increase in Administrative Cost will lead to an increase in Return on Equity by 0.06681% at t-statistics of 1.5916. however, probability (p) value of p=0.1131>0.05 and therefore not significant at 5% significance level. This shows that there is a positive non-significant effect of Administrative Cost on Return on Equity. This result deviates from that of Abor (2005) who found that administrative cost reacted positively and significantly. The difference in results may be attributed to the differences in the actual variables used in the study.

Furthermore, Business Area Cost (BAC) has a t-statistics value of -1.497762 at a coefficient of -0.048787 with probability (p) value of p=0.1358>0.05 and therefore not significant at 5% significance level. This implies that BAC has a negative and non-significant effect on Return on Equity (ROE). This result negates the work of Udoayang, Uwah, and Asuquo (2020) where they held that BAC has a positive and significant effect on ROE. Environmental Remediation Cost (ERC) however has a t-statistics value of 3.4614 with probability (p) value of p=0.0007<0.05 and therefore significant at 5% significance level. This implies that ERC has a positive and significant effect on Return on Equity (ROE). This is in line with the work of Kaoje, Idris, Danrimi, Kurfi, and Abubakar (2020) where they held that ERC has a positive and significant effect on ROE.

The result revealed that 1% increase in Research and Development Cost (R&DC) will lead to an decrease in Return on Equity by 0.04818% at t-statistics of -2.3887 however, probability (p) value of p=0.017>0.05 and therefore significant at 5% significance level. This shows that there is a negative significant effect of R&DC on Return on Equity. This result deviates from that of Oluwafemi, David, Yetunde, Olayinka, Ajetunmobi, and Simon (2018) which found that R&DC reacted positively and significantly to ROE. Social Cost (SC) however has a t-statistics value of -1.34014 and probability (p) value of p=0.1818>0.05 and therefore not significant at 5% significance level. This implies that SC has a negative and non-significant effect on Return on Equity (ROE). This position is in line with the work of Umakanta and Pramod (2020) where they held that SC has a negative and non-significant effect on ROE but negates the works of Jacob, Muhammad, Phung, Thao, Muhammad, and Nguyen (2019) and Lita (2020) where they held that SC has positive and significant effect on ROE. Given the coefficient of determination (R2) as 0.68617 which is 68% supported by value of adjusted R2 as 39%, it presumes that the

independent variables incorporated into this model have been able to explain the effect of environmental cost on corporate performance in the extractive industry in Nigeria to the tune of 39%. That is, there is a significant effect of independent variables (AC, BAC, ERC, R&DC and SC) on dependent variable Return on Equity.

Table 5 Pooled Regression Test Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| **Dependent Variable** | **Independent Variable** | **Coeff.** | **Std. Error** | **t-Statistics** | **Prob.** |
|---|---|---|---|---|---|
| **ROE** | AC | 0.066813 | 0.041979 | 1.591605 | 0.1131 |
| | BAC | -0.048787 | 0.032574 | -1.497762 | 0.1359 |
| | ERC | 0.068092 | 0.019672 | 3.461440 | 0.0007 |
| | R&DC | -0.048186 | 0.020172 | -2.388703 | 0.0179 |
| | SC | -0.027598 | 0.020593 | -1.340144 | 0.1818 |
| **R-Square 0.068261** | Adj. R-Square 0.035920 | Durbin-Watson Stat. 1.117359 | Mean Dep. Variable 2.284181 | S.D Dep. Variable 1.330384 | S.E of Regression 1.304044 |

Source: Author's E-View 10 Output Compilation (2021)

### Fixed Effect Test

The result in Table 6 showed a value of β= 0.00285, p=0.9117>0.05 at t-statistics of 2.45326 which reveals the positive effect of Administrative Cost on Return on Equity (ROE). The study further revealed that 8% increase in the amount spent as Business Area Cost (BAC) will lead to a decrease in the value of ROE by 0.056%, it shows that there is a negative non-significant effect of BAC on ROE (β= -0.05681 p=0.0804>0.05). The findings also exposed that 1% increase in the value of Environmental Remediation Cost (ERC) increases ROE Profile by 0.05477%, it shows that there is a positive significant effect of ERC on ROE Profile at t-statistics of 2.7165 and probability value of p=0.0072<0.05. It was found that 18% increase in Research and Development Cost (R&DC) decreases ROE by 0.028%, this shows that there is a negative non-significant effect of R&DC on ROE (β= -0.02837 t=0.1883>0.05). The study further revealed a value of β= -0.01946, p=0.3459>0.05 at t-statistics of -0.94486 which shows a negative effect of Social Cost (SC) on ROE. Therefore, Business Area Cost, Research and Development Cost and Social Cost has a negative non-significant effect on Return on Equity while

Administrative Cost has a positive non-significant effect on Return on Equity. It also implies that Environmental Remediation Cost has a positive and significant effect on Return on Equity in the extractive industry of Nigeria.

The model had R2 of 9.74% which indicates that the adjusted R-squared is of low value. This implies that the model had low predictive power in using the independent variables to explain the dependent variable under this study. This further implies that more or different predictor variables need to be used in the study. The F-statistic for the model was 2.912275 and the p (F-statistic) of 0.006470 (less than 0.05) shows that the F-statistic was significant and therefore the model as a whole was significant in predicting corporate performance.

Table 6 Fixed Effect Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| Effect Test | Statistics | d.f | Prob. |
|---|---|---|---|
| Cross-section F | 7.335203 | (17,172) | 0.0000 |
| Cross-section Chi-square | 107.408702 | 17 | 0.0000 |

| **Dependent Variable** | **Independent Variable** | **Coeff.** | **Std. Error** | **t-Statistics** | **Prob.** |
|---|---|---|---|---|---|
| **ROE** | C | 1.809187 | 0.737461 | 2.453263 | 0.0151 |
| | AC | 0.001414 | 0.049170 | 0.028700 | 0.9771 |
| | BAC | -0.056810 | 0.032318 | -1.757873 | 0.0804 |
| | ERC | 0.054771 | 0.020162 | 2.716549 | 0.0072 |
| | R&DC | -0.028373 | 0.021487 | -1.320460 | 0.1883 |
| | SC | -0.019460 | 0.020596 | -0.944564 | 0.3459 |
| **R-Square** **0.097361** | Adj. R-Square 0.063920 | F-Stat. 2.912275 | Prob. (F-Stat.) 0.006470 | S.D Dep. Variable 1.330384 | S.E of Regression 1.287156 |

Source: Author's E-View 10 Output Compilation (2022)

### Random Effect Test

The result in Table 7 showed a value of β= 0.073874, p=0.1142>0.05 at t-statistics of 1.586771 which reveals a positive non-significant effect of Administrative Cost on

Return on Equity (ROE). The study further revealed that 1% increase in the amount spent as Business Area Cost (BAC) will lead to a decrease in the value of ROE by 0.084%, it shows that there is a negative but significant effect of BAC on ROE (β= -0.083595, p=0.0032>0.05). The findings also exposed that 10% increase in the value of Environmental Remediation Cost (ERC) increases ROE Profile by 0.032272%, it shows that there is a positive non-significant effect of ERC on ROE Profile at t-statistics of 1.713769 and probability value of p=0.1003>0.05. It was found that 37% increase in Research and Development Cost (R&DC) decreases ROE by 0.016%, this shows that there is a negative non-significant effect of R&DC on ROE (β= -0.016836, p=0.3747>0.05). The study further revealed a value of β= -0.01110, p=0.5522>0.05 at t-statistics of -0.595606 which shows a negative effect of Social Cost (SC) on ROE. Thus, Research and Development Cost and Social Cost has a negative non-significant effect on Return on Equity while Environmental Remediation Cost has a positive non-significant effect on Return on Equity. It also implies that Administrative Cost has a positive and significant effect on Return on Equity and Business Area Cost has a negative and significant effect on Return on Equity in the extractive industry of Nigeria. The model had R2 of 8.23%. The interpretation of the low adjusted R-squared value is that the model had low extrapolative influence in using the independent variables to explain the dependent variable as adopted in this study. This further implies that more or different predictor variables need to be used in the study. The F-statistic for the model was 2.422578 and the p (F-statistic) of 0.02129 (less than 0.05) shows that the F-statistic was significant and therefore the model as a whole was significant in predicting corporate performance in the extractive industry in Nigeria.

**Table 7** Random Effect Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| Random Test | S. D | Rho |
|---|---|---|
| Cross-section random | 0.744493 | 0.3443 |
| Idiosyncratic random | 1.027317 | 0.6557 |

| Dependent Variable | Independent Variable | Coeff. | Std. Error | t-Statistics | Prob. |
|---|---|---|---|---|---|
| **ROE** | C | 0.658505 | 0.966972 | 0.680998 | 0.4967 |
| | AC | 0.073874 | 0.046556 | 1.586771 | 0.1142 |
| | BAC | -0.08359 | 0.028005 | -2.985005 | 00032 |

| | | | | | |
|---|---|---|---|---|---|
| | ERC | 0.0322272 | 0.019831 | 1.713769 | 0.1003 |
| | R&DC | -0.016836 | 0.018920 | -0.889860 | 0.3747 |
| | SC | -0.011100 | 0.018636 | -0.595606 | 0.5522 |
| **R-Square 0.082337** | Adj. R-Square 0.048350 | F-Stat. 2.422578 | Prob. (F-Stat.) 0.021290 | S.D Dep. Variable 1.069459 | S.E of Regression 1.042828 |

Source: Author's E-View 10 Output Compilation (2021)

### Hausman Test

To establish the effect of environmental cost on corporate performance, the panel data approach of fixed-effects and random-effects models are applied. However, if p-value is <5%, the Hausman test would imply that the random-effects model is rejected and the fixed-effects model is more appropriate. The panel data regression workings on effect of the variables of environmental cost on Return on Equity of the extractive industry in Nigeria are presented in Table 8 where the Hausman test is restated and indicates that p-value is p=0.077<0.05 as shown below. This implies that the random effect model be adopted. The estimation of the model for the extractive industry having Return on Equity (ROE) as corporate performance indicator with a sample size of 18 firms, 11 years and 198 observations. In accordance with the random-effects estimation model, the results for the effect of environmental cost on ROE shows p-value of F-statistic < 0.01, with a good explanatory power (R2 = 0.476728).The result further indicates that there is no significant statistical effect by the intercept on ROE and there exist a positive and weak significant effect of Administrative Cost on Return on Equity. Business Area Cost has a negative and highly significant effect on ROE, while Environmental Remediation Cost possess a positive non-significant effect. Research and Development Cost and Social Cost showed no statistical effect on Return on Equity.

**Table 8** Hausman Effect Model of Effect of Environmental Cost on Corporate Performance in the Extractive Industry in Nigeria

| Test Summary | | Chi-Sq. Stat. | | Prob. |
|---|---|---|---|---|
| Cross-section random | | 12.771569 | | 0.0779 |
| Variable | Fixed | Random | Var. (Diff) | Prob |
| AC | 0.101383 | 0.073874 | 0.000186 | 0.0437 |
| BAC | -0.093124 | -0.083595 | 0.000029 | 0.0792 |

| | | | | |
|---|---|---|---|---|
| ERC | 0.023387 | 0.032272 | 0.000041 | 0.1676 |
| R&DC | -0.014039 | -0.016836 | 0.000016 | 0.4852 |
| SC | -0.005080 | -0.011100 | 0.000024 | 0.2209 |
| FIRM SIZE | 0.439762 | 0.311289 | 0.024933 | 0.4159 |
| LIQUIDITY | 0.005678 | 0.003459 | 0.000000 | 0.0010 |

| Independent Variable | Coeff. | Std. Error | t-Statistics | Prob. |
|---|---|---|---|---|
| C | 0.254040 | 1.253864 | -0.202605 | 0.8397 |
| AC | 0.101383 | 0.048513 | 2.089820 | 0.0381 |
| BAC | -0.093124 | 0.028526 | -3.264496 | 0.0013 |
| ERC | 0.023367 | 0.020850 | 1.121701 | 0.2636 |
| R&DC | -0.014039 | 0.019339 | -0.725953 | 0.4689 |
| SC | -0.005080 | 0.019274 | -0.263571 | 0.7924 |
| R-Square 0.476728 | Adj. R-Square 0.403713 | F-Stat. 6.529207 | Prob. (F-Stat.) 0.0000 | S.E of Regression 1.027317 |

Source: Author's E-View 10 Output Compilation (2021)

## DISCUSSION OF FINDINGS

The study's findings revealed specific aspects of environmental disclosure, such as environmental remediation costs, administrative costs, R&D costs, and social costs.The cost of environmental variables like environmental remediation cost and administrative cost has a positive effect on financial performance. Business location cost has a negative and highly significant effect on financial performance. Research and Development Cost and Social Cost have no effect on the financial performance of selected sampled extractive industries in Nigeria. The results showed that there is a significant difference in the effects of all these identified components on the financial performance of the extractive industry in Nigeria. These results are supported by earlier studies by Munasingbe Ngozi and Ike (2019). Findings showed that business location costs exert a negative and highly significant effect on financial performance, while research and development costs and social costs have no significant effect on the financial performance of selected sampled extractive industries in Nigeria. The result negates the argument of Ahmed, Muhammed, and Jubril (2017).

## CONCLUSION AND RECOMMENDATION

Based on results of Findings, it can be concluded that business location Cost exert negative and highly significant effect on financial performance while Research and Development Cost and Social Cost has no significant effect on financial performance of selected sampled extractive industry in Nigeria. Thus, it was recommended that extractive industry in Nigeria should be objective in their financial expenses so as to improve on their performance possibilities.

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