GREEN ACCOUNTING AND FINANCIAL PERFORMANCE IN NIGERIAN INDUSTRIES: A STUDY OF SELECTED OIL AND GAS FIRMS IN NIGERIA

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Abstract

This study investigated the effect of Green Accounting on the financial performance of selected oil and gas firms in Nigeria. The specific objectives of the study were to: investigate the effect of emission control cost, the effect of renewable energy cost, and the effect of pollution remediation costs control on the financial performance of selected oil and gas firms in Nigeria. The study adopted ex post facto research design and the panel least squares regression technique. The study found that: emission control cost with coefficient (421.2015) and p-value (0.0022) has significant positive effect on the return on capital of selected listed oil and gas firms in Nigeria; pollution control cost with Coefficient of 2.018446 and p-value of 0.0000, has positive significant effect on the return on capital of selected listed oil and gas firms in Nigeria and that renewable cost energy with coefficient (80.40683) and p-value (0.0056) has significant positive effect on the return on capital of selected listed oil and gas firms in Nigeria. The study concluded that Green accounting has significant positive effect on the financial performance of selected oil and gas firms in Nigeria. Based on the findings of the study, the following recommendations were put forward: the oil and gas firms should prioritize Green Accounting as a significant component of their management process, the firms should adopt management practice, and as well adopt the pollution remediation, emission control and renewable energy control costs accounting in their production accounting model.

Key Words: *Green Accounting, Financial Performance, Emission Control costs, Renewable Energy costs, Pollution Remediation costs,*

1. INTRODUCTION

Climate change and global warming are some of the major issues facing the world and operations of most Companies in Nigeria due to increasing expansions in industrial production especially oil exploration, solid mineral mining, energy generation and other carbon related activities. This rise in industrial activities however gave rise to environment concerns. These activities leave long lasting and mostly hazardous effect on the ecosystem and by implication human and animal life. For instance, the hazardous effects of limestone mining, lead mining and salt mining activities in some parts of Ebonyi State in Nigeria, such as Ezza North, Enyigba, Ivo and Ikwo have left many precious lands useless. These mining activities created big pits that

were later flooded with water thereby reducing the available farm land, also making the affected area fragile for any potential development, while aquatic animals were eliminated in the rivers around the salt mining, oil exploration and gas flaring areas. Moreover, air, water and noise pollution from these exploration and mining activities have endangered the health of many people within the host community. These concerns have led government at different levels to enact legislations that seek to protect the environment from the dangerous impact of mineral exploration and related activities on the environment. The legislations have come in form of safety and security (industrial safety) laws with attendant consequences on the operations of the firms. The increasing awareness by stakeholders of environmental activities of the firm has prompted managers to introduce as part of their strategy the accounting for the effect of firms' activities on the environment which has led to increasing attention on what is now called Green Accounting.

Green accounting is a type of accounting that attempts to factor environmental costs into the financial results of operation. It helps to identify and quantify the costs of pollution remediation, waste, greenhouse gases, emission control, renewable energy and other environmental damages, and to assess the value of natural resources such as air, water, emissions as well as recycling, packaging and land.

The importance of Green accounting is not restricted to; the need of the company to submit information on social activities and environmental protection to the stakeholders of the company which will in turn build trust and improve their bottom line and induce companies to be socially responsible to the society. It also aims at the sustainability of environmental resources. Today, green accounting has gained global support among the developed countries and developing economies, because it allows companies to reduce the level of degradations on the environment as well saves environmental and development problems.

1.2 Statement of problem

The increasing effect of oil exploration, solid mineral mining, energy generation and other carbon related activities on the environment continues to pose a challenge on the ecosystem and by implication animal and people in the host communities. This is due to the lack of compliance to green accounting standard or perhaps inability to prioritize the green accounting that could ensure that firms are accountable for their actions in the environment. It also include craze for excessive profits, lack of openness and disclosure in the firms environmental reports who does not seek to address the prevalent cost associated in oil and gas production which includes but not restricted to Emission Control Costs, Renewable Energy Costs and Pollution Remediation Cost in their Financial Statements in order to show real data and information that reflect their financial situation which will in-turn be used to remedy environmental degradation. The effects

of green accounting on the financial performance of production companies may sometimes be limited to specific environmental measures, such as reducing carbon emissions, and may not capture the full extent of the company's environmental impact. The activities of these industrial production especially oil and gas exploration hold many major potential hazards to the environment which have led to recent increase in environmental concerns over the years due to the impact of the rapid oil and gas exploration, energy generation, solid mineral mining activities and others around the world, in which Nigeria is not in isolation.

The adoption of green accounting may face resistance from traditional industrial production firms that have not traditionally prioritized environmental concerns. This resistance may make it challenging to implement green accounting, hindering the potential benefits they may bring; such reluctant stance to adopt green accounting may have fueled crime and criminality such as oil bunkering, kidnapping and insecurity. Specifically, lack of environmental concerns may have caused local mobs declaring war against oil shipments by engaging in different obnoxious activities including oil theft (commonly referred to as bunkering), pipeline vandalizations, abduction of oil workers and forcing the oil firms to stop production. This was in their effort to ensure oil wealth redistribution owing to the negligence of environmental defect of the activities of the industries, which they argued that these oil companies are insensitive to their corporate social responsibility on the host communities.

Meanwhile, existing empirical works on environmental disclosure and financial performance have shown mixed results. Some studies like Emenike, John and Umeoduagu (2017), Utile, Tarbo and Ikya (2017) Eboh and Chukwuka (2018), Ikpor, Ituma and Okezie (2019), Muffee (2021) and Okwudili, Amedu and Uagbale (2023), show a positive effect and relationship while studies by Aggarwal (2018) and Hosam, Maher, Hongren, Gunawan and Salsabila (2020) show a negative relationship. The mixed results require further investigation. However, much had not been said about the effect of these key variables; emission control cost, pollution remediation cost, renewable energy cost and return on capital employed. It is against this backdrop that this study will examine the impact of Green Accounting (proxied to emission control cost, pollution remediation cost and renewable energy cost) on the financial performance (proxied to return on capital employed) of Nigerian industries; using a selected oil and gas firms listed on the floor of Nigeria Exchange Group Ltd.

2. REVIEW OF RELATED LITERATURE

Green accounting

Lako (2018) defined green accounting as an accounting system which considers the environmental impact of economic activities. Hence, it could be described as a way of measuring and reporting the economic and environmental performance of a business or organization. It is also referred to as environmental accounting – the process through which companies disclose information relating to environmental performance to show their evidence of accountability information. It is a growing field in Accounting which identifies resource use measures and communicates costs of an organization or national economy actual or potential impact on the environment (Eze 2021). Also, Smulders (2008) defined green accounting as a type of accounting that attempts to factor environmental costs into the financial results of operation.

Green Accounting is the process of recognizing, measuring value, recording, summarizing, reporting and disclosing information on objects, transactions, events or impacts of corporate economic, social and environmental activities on society and the environment and the corporation itself in an integrated accounting information reporting package that can be useful for users in economic and non-economic decision making (Uwuigbe, 2011), it is a type of accounting that takes note of the transfers of businesses reports on environmental costs to their stakeholders. This type of accounting enables a company to gather the cost of sustaining the environment while carrying out her normal/ daily business activities, discover benefits and gains from such activities, and provide the best means possible for quantitative measurement and encourage the communication of the results.

The concept of green accounting recognizes that traditional accounting methods only consider financial performance, and do not take into account the social and environmental costs of economic activities. Green accounting aims to provide a more comprehensive picture of a company's performance by incorporating environmental factors into financial reporting. The taking of corrective management action to reduce environmental impacts and costs plus, where appropriate, the external reporting of the environmental and financial benefits in established corporate environmental reports or published annual reports and accounts (Environmental Agency, 2011).

Emission Control Cost

According to Howes (2002), emission control cost means, the cost of the release of greenhouse gases (GHG) and/or any other precursors into the atmosphere over a specified area and period of time.

Renewable Energy Cost

Renewable energy, often referred to as clean or green energy, comes from natural sources or processes that are constantly replenished; it is a way to generate energy from unlimited natural resources. These resources are either available with no time limit or replenished more quickly than the rate at which they are consumed. Renewable energy cost therefore is the cost incurred in trying to constantly replenish unlimited natural energies resulting from the usage. Renewable energies costs are the cost of the cornerstone of the energy transition. The most popular sources of renewable energy costs currently are: solar energy cost, wind energy cost, hydro energy cost, tidal energy cost, geothermal energy cost, and biomass energy cost (Ali & Rizwan, 2013, Al-Shaer, Salama and Toms, 2015). Renewable energy cost is often thought of as a new technology cost which is seen as a solution for the future cost, employing nature's power has long been used for heating, transportation, lightening and more.

Pollution Remediation Cost

Pollution costs refer to the financial costs associated with remediation or clean-up of pollution caused by a company's operations. This can include costs associated with cleaning up contaminated soil or water, restoring natural habitats, and compensating affected communities or individuals. Pollution costs are an important consideration for companies as they can have a significant impact on the financial bottom line. Companies that cause pollution may be held liable for the costs associated with remediation and may also face legal penalties or fines for non-compliance with environmental regulations. Effective pollution cost management requires companies to take steps to minimize their environmental impact and prevent pollution from occurring in the first place. This can include investing in clean technologies, implementing best practices for waste reduction, and engaging in sustainable resource management (Muhammad, Ramdany and Heri 2023). In addition to reducing pollution costs, companies can also benefit from proactive pollution cost disclosure. By disclosing their pollution costs, companies can demonstrate their commitment to sustainability and build trust with stakeholders. This can also help companies identify areas for improvement and take steps to reduce their environmental impact over time.

Financial Performance

Performance is a widely used concept in many areas. Although, numerous researches have been carried out on the issues of performance, the definition of performance is still debated. In enterprise management, Emenike, John-akamelu & Umeoduagu, (2017) defined an organization's performance as "how well an organization is managed" and "the value the organization delivers for customers and other stakeholders". It measures results of a firm's policy and operations in monetary term, and overall financial health over a period of time. (Solomin and Ayodeji, 2019) suggests that It can also be used to compare similar firms

across the same industry, industries or sectors. Generally, Return on capital employed (ROCE) is a ratio used in finance and accounting, as a measure of financial performance and profitability. The return on capital is a financial ratio that measures the rate of return a company earns on the money it has invested in its business. According to Nuno (2014) return on capital employed is defined as a ratio used in finance, valuation and accounting, as a measure of the profitability and value-creating potential of companies relative to the amount of capital invested by shareholders.

Empirical Review

Okwudili, Adinoyi and Ekatah (2023) examined the effect of social and environmental disclosure respectively on gross profit margin (GPM) and return on capital employed (ROCE) of manufacturing firms in Nigeria. The study adopted ex-post facto research design while data were analyzed using ordinary least square (OLS) regression. Finding from the regression analysis showed there is significant positive effect of social disclosure on GPM. However, no significant effect of environmental disclosure was observed on ROCE, which could have been due to other factors outside our scope of study. The major point of departure from Okwudili, Adinoyi and Ekatah's (2023) work and the current study is in the model variables. In the current study we employ the emission control cost, pollution remediation cost and renewable energy cost. These were absent in the model developed by Okwudili *et al,* (2023).

Muffee (2021) examined the effect of environmental accounting on corporate performance using environmental liability, cost, profit, and corporate resources as measurement variables. The area of study was development and management mission for industrial zones (Magzi Ombe in South-West Region of Cameroon) while the opinions of 40 respondents were sampled from 6 organizations. The Pearson correlation analysis used in the study revealed that there is significant positive relationship between environmental accounting and corporate performance. The study by Muffee differs from the current study by methodology and modeling. Muffee employed qualitative analysis while the current study employed quantitative analysis which allows for proper measurement and quantification of the effects.

Hosam, Maher, Hongren, Gunawan and Salsabila (2020) analyzed the green accounting (GA) impact on financial performance (FP). Secondary data and multiple regression analysis were employed. The study proxied Green Accounting cost to environmental cost (EC), while financial performance employed a proxy of Return on Capital Employed (ROCE). The finding revealed that Green accounting costs on financial performance has a negative relationship. However, what make the current study different is that the time scope is expanded to read current incidents up to 2023. Also the current study employ the model variables

of emission control cost, pollution remediation cost and renewable energy cost which differ from Hosam et al, (2020) model variables.

Eboh and Chukwuka (2018) conducted an empirical investigation into the effect of green business practices on organizational performance of selected manufacturing firms in Nigeria. Simple random sampling technique was used in selecting the 10 manufacturing firms with a sample size of 543 respondents out of a population of 5705 drawn from management, middle and lower cadre of the selected manufacturing firms using Cochran (1977) statistical formula. Data were analyzed using linear regression model. Findings revealed that green business initiatives had significant and positive effect on the selected manufacturing firms' productivity, which indicates that the implementation of green business practices, principles and processes will lead to very positive outcome that will be visibly manifested in the organization and the environment. The study used survey design, linear regression to analyze data and also productivity as a model variable for organizational performance while the current study employ panel least square regression model, secondary source of data, and return on capital employed as a model variable for performance.

Utile, Tarbo and Ikya (2017) investigated the effect of environmental reporting on the financial Profitability of listed manufacturing companies in Nigeria. The study aimed at determining the effect of erosion control cost (ECI), waste management cost (WMI) and air pollution cost (API) on the financial Profitability of listed manufacturing firms in Nigeria. The study adopted an ex-post facto research design using the random effect regression analysis as the major technique for data analysis. It was found that erosion control cost, waste management cost and air pollution control cost has significant positive effect on the financial Profitability of listed manufacturing firms in Nigeria.

Aggarwal (2018) analyzed the relationship between environmental responsibility and financial performance of firm through review of extant literature, so as to find answer to the research question 'whether going green is profitable for firm or not'. The results are mixed, inconsistent and often contradictory; ranging from positive, to negative, to statistically insignificant relationship; depending upon the choice of measure of environmental responsibility, measure of financial performance, sample composition, time period and control variables.

Ikpor et al, (2019) examined the effect of environmental accounting on sustainable financial performance of firms in Nigeria, using data from ten petroleum companies operating in the Niger-Delta part of Nigeria over a period of 48 years (1970-2017), employed ordinary least square regression model to analyze data.

The study found that environmental operating costs and environmental prevention costs have significant impact on the profitability of petroleum firms in Nigeria. The model variables used in the current study differ from the study of Ikpor et al (2019) in that the current study adopted emission control costs, pollution remediation costs, renewable energy costs and return on capital employed (ROCE). Also the current study used panel least square regression model while the study of Ikpor et al, (2019) employed ordinary least square regression method.

Theoretical framework

The theoretical framework adopted for this study is sustainability development theory propounded by United Nations Brundtland Commission in 1987. The theory states that sustainability development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This theory was further amplified in 2002 by world summit on sustainable development which posits that Sustainability theory stands for three pillars: social development, economic development and environmental development.

The basic assumption of the theory is that companies have a responsibility to consider the long-term impacts of their activities on the environment and society and should be pursued in a way that is environmentally sustainable, socially equitable, and economically viable. This theory is relevant to this study following Nigeria's 2020 voluntary national review (VNR) on sustainable development goals which focused on the key issues of poverty, health and wellbeing, gender equality, and enabling environment of peace and security. Sustainable development theory can be used to analyze the potential social and economic costs of critical emission cuts in Nigeria and to identify ways to achieve sustainable development while reducing emissions. By adopting green accounting practices, companies can demonstrate their commitment to sustainability, which can attracts socially responsible investors, customers, and employees. This can improve company's long term financial performance by reducing risk, increasing stakeholder engagement and enhancing reputation. However, profit may not be attainable if the environment in which the business operates is neglected.

3. Research Methodology

The study adopts *ex-post-facto* research design. The design was used because the study relied heavily on already existing secondary data of green accounting and financial performance of listed oil and gas industries in Nigeria, and its capacity to determine the cause and effect relationship between variables without any manipulation. It is aimed to know the effect of green accounting in terms of emission control, renewable energy and pollution remediation costs on a firm's return on capital. The population of the study

consisted of all the oil and gas companies listed by the Nigerian Exchange Group as at 31st December 2022, out of which five (5) oil and gas companies chosen, reasons being that they remain listed for the period under review and their choice was based on the availability and reliability of data. Census sampling techniques was adopted for the study. The study used panel data from secondary sources, which were obtained from the published annual reports and accounts of the selected listed oil and gas companies in Nigeria. The data collected covers 2013 – 2022 with five (5) companies and ten (10) years period which gives a total observation of fifty (50). The study examined whether green accounting proxied to (emission control, pollution remediation and renewable energy costs) impact on financial performance proxied to return on capital employed. Multiple regression analyses technique was employed in order to ascertain the impact of green accounting on financial performance of listed oil and gas companies using Panel data. A model was adopted thus:

The Dechow et al (1995) modified Jones model is modified to suit the research objectives thus:

ROC =f (ECC, PCC, REE)……Equation 1

The econometric form of the model for estimation is given thus:

$ROC= \beta_0 +\beta_1 ECC +\beta_2 REE +\beta_3 PCC + \mu$……Equation 2. Where:

ROC = Financial performance proxied by Return on capital

ECC = Emission control cost , REE= Renewable energy and PCC = Pollution remediation cost

$\beta_1 – \beta_3$= coefficient of explanatory variables

β_0= constant or Intercept μ_{it} = Error term for firm i in year t

Where β_1, β_2, β_3 are estimated coefficients from the second equation, there the study use absolute measure of return on capital as a proxy for the extent of financial performance.

The study used descriptive statistic and ordinary least square of multiple regressions to analyze data

The presentation of result, analysis and interpretation of the data collected from annual report and account of the selected oil and gas companies were interpreted using the mean, minimum, maximum and standard deviation.

4. Results

The goal of the section is aimed at previewing the characteristics of the dependent and independent variables and estimating the quantitative value of the independent variables. The tests include the unit root test, the correlations test and Panel least squares regression.

4.1 Unit root test

In order to ensure the policy and forecasting reliability of the data employed in this, it was subjected to unit root diagnostic test and the summary of the result is presented below:

Table 2: Unit root test result

Variable	ADF-Fisher @level	P-value	Cross section	Observation	Order	Remark
ROC	34.3519	0.0002	5	50	1(0)	stationary
EMC	25.6640	0.0097	5	50	1(0)	stationary
PCC	47.42297	0.0000	5	50	1(0)	stationary
REE	34.3237	0.0015	5	50	1(0)	stationary

Source: Author's computation 2023 (E-views)

The result in table 2 above shows that the model variables (return on capital – ROC, emission control – EMC, pollution control cost – PCC and renewable energy – REE) were stationary (@ level as the unit root test confirms. Hence, they are integrated of order 1(0). The conclusion of stationarity is based on the fact that following the rule for unit root testing, p-value of the individual (ADF-Chi-square test statistic) of the variables is less than the 5% significance level. The implication of stationary process or series is that the model employed can be relied upon for policy analysis and decision making.

4.2 Correlation Test

Correlation test was used to ascertain the strength and magnitude of the relationship between the dependent and independent variables. The result of the correlation test is presented in table 3.

Table 3: Correlation Matrix

	ROC	EMC	PCC	REE
ROC	1.000000			
EMC	0.708822	1.000000		
PCC	0.684432	0.074077	1.000000	
REE	0.816462	-0.273463	0.147051	1.000000

Source: Author's Computation 2023 (Eviews)

The correlation test result in table 3 above shows the correlation movements of the dependent variable (return on capital – ROC) and the independent variables (emission control, pollution control cost and the renewable energy). The relationship was positive between the return on capital and the explanatory variables. This implies that there is a direct positive relationship between the green accounting components actions of the firms and their financial performance.

Trend Analysis Graph Description

From the graph in the appendix, it is indicated that the trend line for the return on capital as a measure of the financial performance of the firms was highest for Oando Plc between 2013 and 2014, followed by Conoil Plc and Total E & P Plc in that order. Green accounting helps to identify and quantify the costs of

pollution, waste, greenhouse gases and other environmental damages, and to assess the value of natural resources such as air, water, emissions as well as recycling and packaging and land. Green accounting is becoming increasingly important as it has implications on the financial performance of oil and gas firms

Emission Control Graph Description

Emission control graph from the appendix poses some degree of cost implications for firms and their financial performance. Hence, energy firms take into account the need to provide proper accounting of its emission control costs which help them in proper assessment of performance. From the figure above, it is indicated that across the firms, the emission control cost varied. The trend was upward for MRS Oil and Gas Plc, followed by Oando and Conoil in that order. The amount spent by the energy firms on emission control could significantly have effects on its returns on capital, thus there is need to properly account for it as a component of the green accounting practice of energy firms in Nigeria.

4.3 Panel Regression Result

Table 4 below presents the panel regression results

Table 4: Regression result

Dependent Variable: ROC

Method: Panel Least Squares

Date: 05/15/23 Time: 09:41

Sample: 2013 2022

Periods included: 10

Cross-sections included: 5

Total panel (balanced) observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EMC	421.2105	26.75752	2.574176	0.0022
PCC	2.018446	0.406901	3.045333	0.0000
REE	80.40683	5.156268	2.959400	0.0056
R-squared	0.682746			

Source: Author's Computation 2023 (Eviews)

Observing this result (table 3 above), the study pooled all 50 observations together in the regression model, not taking cognizance of features such as the cross section and time series nature of the data. The coefficient of determination (R-squared value) for the regression model is 0.682746 indicating that about 68.28% of

total variation in the financial performance of the selected oil and gas firms is explained by the green accounting components variables (emission control cost, pollution control cost and the renewable energy). Following the regression estimates, all the green accounting variables turned up positive and significant. This is confirmed by the population parameter (t-stat) and the p-value of the coefficients [emission cost, EMC- t-stat = 2.574176, p-value = 0.0022], [pollution control cost, PCC- t-stat = 3.045333, p-value = 0.0000], and [renewable energy cost, REE- t-stat =2.959400, p-value = 0.0056]. Hence, the green accounting components of the oil and gas firms have significant impact on their financial performance.

4.4 Test of Research Hypotheses

In this study, the decision making on the statistical significance of the results obtained for each of the research hypotheses rests on the probability values and the level/ direction of the coefficient. Thus, in testing the first, second and third hypotheses, the P-value of the population parameters (t-statistics) in table 3 were used and provide the basis for the decision rule.

4.4.1Test of Hypothesis One

Step 1: Restatement of the null Research Hypothesis

H_{01}: Emission control cost has no significant effect on the financial performance of selected oil and gas firms in Nigeria

Step 2: Decision Rules

Decision Rule 1**:** Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). It implies that the estimated variable has significant impact on the dependent variable.

Decision Rule 2: Accept the null hypothesis and reject the alternate hypothesis if the p-value is greater than the chosen level of significance (0.05). It implies that the estimated variable has insignificant impact on the dependent variable.

Step 3: Decision

Based on the regression result presented in table 3, the coefficient of emission control parameter is positive and significant in determining financial performance of the firms. This statement is based on its p-value. Since 5% (0.05) level of significance is greater than the P-value [0.05 > 0.0022], the null hypothesis is rejected, the study, accordingly accepts the alternate hypothesis and the study concludes that emission control has positive significant effect on the financial performance of selected oil and gas firms in Nigeria.

4.4.2 Test of Hypothesis Two

Step 1: Restatement of the null Research Hypothesis

H_{02}: renewable energy has no significant impact on the financial performance of selected oil and gas firms in Nigeria

Step 2: Decision Rules

Decision Rule 1: Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). It implies that the estimated variable has significant impact on the dependent variable.

Decision Rule 2: Accept the null hypothesis and reject the alternate hypothesis if the p-value is greater than the chosen level of significance (0.05). It implies that the estimated variable has insignificant impact on the dependent variable.

Step 3: Decision

Based on the regression result presented, the coefficient of renewable energy (REE) is 0.008085 whereas its p-value is [0.0056]. The parameter of renewable energy has significant positive effect on the return on capital of the oil and gas firms. Following the decision rule, the study rejects the null hypothesis. The alternative hypothesis that renewable energy has significant positive impact on the financial performance of selected oil and gas firms in Nigeria is hereby accepted.

4.4.3 Test of Hypothesis Three

Step 1: Restatement of the null Research Hypothesis

H_{03}: pollution costs control (Remediation cost) has no significantly impact on the financial performance of selected oil and gas firms in Nigeria

Step 2: Decision Rules

Decision Rule 1: Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). It implies that the estimated variable has significant impact on the dependent variable.

Decision Rule 2: Accept the null hypothesis and reject the alternate hypothesis if the p-value is greater than the chosen level of significance (0.05). It implies that the estimated variable has insignificant impact on the dependent variable.

Step 3: Decision

Based on the regression result presented, the coefficient of pollution control cost (PCC) is 2.018446 whereas its p-value is [0.0000]. Following the decision rule, the study rejects the null hypothesis. The alternative hypothesis that pollution costs control (Remediation cost) has positive significant impact on the financial performance of selected oil and gas firms in Nigeria is hereby accepted.

4.5 Discussions

This study investigates the effect of Green accounting on the financial performance of listed oil and gas firms in Nigeria - assessing to what extent the green accounting components as decomposed into emission control cost, pollution control cost and renewable energy influences the return on capital of the selected firms. The study sought whether to satisfactorily pin it that Green accounting components or other microeconomic/macroeconomic environment significantly influence the financial performance of listed oil and gas firms in Nigeria. Based on a sample consisting of five (5) selected oil and gas firms in Nigeria over the study period (2013-2022), Panel least square model was estimated to discern the whether the variables emission control cost, pollution control cost and renewable energy cost) are significant determinants of the financial performance (return on capital) for firms operating in the energy sector. The results indicate that the firms are on a safe path and can attain significant improvement in their financial performance by modeling their production activities while adopting Green accounting practice. Therefore, the industry players should seek incorporate and strictly apply Green accounting.

4.6 Policy Implication of the Result

The policy implication of this result is not varied but one-way. It implies that maintaining a functional Green accounting culture is a policy that could enhance the financial health of oil and gas firms; as such advantage can be translated into higher retained profits, ability to withstand a financial downturn and other overall improvements in the value of their return on capital employed.

5. Summary, Conclusion and Recommendations

The summary of the findings is based on the results obtained from the panel least squares econometric regression techniques and the tests of hypotheses carried out in the study. Below is the summary of the major research findings:

1. The study found that emission control has significant positive effect on the return on capital employed of selected listed oil and gas firms in Nigeria.
2. The study found that the pollution control cost has positive significant effect on the return on capital employed of selected listed oil and gas firms in Nigeria.

3. The study also found that renewable energy has significant positive effect on the return on capital employed of selected listed oil and gas firms in Nigeria.

The study examined the effects of Green accounting components on financial performance of selected oil and gas firms in Nigeria for the period 2013 to 2022 using panel data generated from 5 selected listed oil and gas firms in Nigeria. Based on findings from the empirical results, the study concludes that Green accounting components has significant positive effect on the financial performance of selected oil and gas firms in Nigeria. Based on the findings of the study, the following recommendations are put forward:

1. The oil and gas firms should prioritize green accounting practices as a significant component of their management process, because it helps to facilitate production and improve the financial performance of the firms.
2. The firms should adopt a management practice where the emission control accounting is also a significant variable; the emission control as a green accounting variable contributes to the financial performance of the firms.
3. The firms should also adopt the pollution cost and renewable energy accounting in their production accounting model as it helps the firms to leverage its external economies of scale and improve financial performance.

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