Environmental Accounting Costs and Financial Performance of Selected Quoted Oil and Gas Companies in Nigeria

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Abstract: **The focus of this study is to examine the effects of environmental accounting costs on the financial performance of selected quoted oil and gas firms in Nigeria. To achieve this objective, Secondary source of data was used in the study and sourced through Nigeria exchange group and companies' annual report of Conoil, MRS Oil and Forte Oil covering the period of 21years (2000-2020). The study adopted both the descriptive and inferential statistics in analyzing the panel data and in order to empirically investigate the effect of the explanatory variables on the dependent variable, multiple regression model involving ordinary least square method was used to test hypotheses formulated. Results from the regression indicate that environmental internal failure cost and environmental external failure cost have a positive and significant effect on the financial performance of oil and gas companies in Nigeria, while, Environmental pollution prevention costs and environmental detection costs revealed an insignificant effect on the financial performance of oil and gas companies in Nigeria. The Implications of these results are that, if the variables are not identified and improved upon, the challenges facing environmental accounting costs on the financial performance of the companies may persist and may lead to sub optimal performance and failed vision. Thus, the study concluded that the environmental accounting costs have significantly affected the general financial performance of oil and gas industry in Nigeria. The study therefore recommends that the management of petroleum companies should continue to put funds on internal failure cost to ensure continuous reduction of contaminants in the environment to an amount that complies with environmental standards.**

Keywords: **environmental internal failure cost, environmental external failure cost, Environmental pollution prevention costs, environmental detection costs, return on equity**

I. INTRODUCTION

Financial performance is a major key in all economic decision making relating to public and private companies to identify the difficult and hidden cost (Chashim & Fadaee 2016). Financial performance is a quantitative ration of how well a firm uses assets from its business operations and generate revenues. The Financial performance is also seen as a measure of a firm's overall financial health over a given period of time. According to Grant (2003), the most frequently used ratio for shareholder wealth creation has been total returns to shareholders but this method was faulted by some scholars who asserted that the financial health of a company cannot be measured by total returns because the needed cost of capital associated with the risk of the business and the debt involvement of the company. Assessing the financial performance of the firm at a given time can be measured by value-based measure (Grant 2003). The financial position of firm is now necessary for investors to take decisions on activities of the organization. Bingilar & Oyadenghuan (2014) stated that detailed accounting information are however needed to know if a company is making profit or not.

According to Okolie (2006), the real problem of profitability measurement is not, however, what we should measure. It is what to use as yardstick for measuring it. Usually profit as a percentage of sales will not indicate how vulnerable a product or business is to economic fluctuation. Only a breakeven point analysis will do that. Another yardstick could be return on invested capital. Though this makes sense but it is still not a very good yardstick because from return on invested capital, the following question will usually arise. What is invested capital? Is capital to be defined with the accountant as original cash value less subsequent depreciation? Or is it to be defined with the economist as wealth producing capacity in the future, discounted at capital market interest rate at current cash value? Neither definition gets us far. The accountants' definition makes no allowance for changes in the purchasing power of the currency or for technological changes. It does not permit any appraisal of business performance for the simple reason that it does not take the varying risk of different businesses into account, does not allow comparison between different businesses, does not allow comparison between different components of the same company, does not allow the comparison between the old plants and the new plants etc, and above all it tend to encourage technological obsolescence.

Businesses as part of human activities for existences are conducted within and around the environment, thus making the environment an important point of discourse. The nature of the world's environment and the impact of human race on the ecology globally have resulted to intense public concern and scrutiny about the activities and performances of

organizations (Agbiogwu, Ihendinihu and Okafor, 2016). Also, taking cognisance of the environment, business organizations now demonstrate their concern for it through environmental accounting. Akpan (2013) described environmental accounting as a type of accounting that attempts to measure the impact of business decisions after carrying out due diligence study on the environment which is expected to make the company socially responsible to the environment. Environmental accounting is largely concerned with the cost and benefits associated with use of the natural environment. Adejola (2013) defined Environmental cost as the costs; capital or recurrent which are incurred by a firm to ensure that organizations' activities do not cause harm to the environment or replenishment damage to the environment resulting from the firms' activities. Most times, the identification of environmental cost has posed a difficult task to organizations especially when hidden in order overheads instead of being separated. However, according to Adejola (2013), environmental costs can be categorized into: Environmental Pollution Prevention Costs, Environmental Detection costs, Environmental Internal failure cost and Environmental External failure cost. Environmental Pollution Prevention Costs is also seen as costs or expenses undertaken to forestall damages to the natural environment which includes land, water, air, forest, wildlife, etc. due to the organizations' activities. It includes costs of recycling products, training staff and carrying out environmental studies (Adejola, 2013). Environmental detection costs are the costs of activities executed to determine if products, processes, and other activities within the firm are in compliance with environmental appropriate standards. Environmental Internal failure cost are incurred to Eliminate and manage contaminants or waste once produced. While Environmental External failure cost are the costs of activities performed after discharging contaminants and waste into the environment (Homan, 2016).

Businesses all over the world, especially oil and gas firms for many decades have ignored the impact of their activities on the natural and social environment in which they operated, unless it had direct repercussions on the profit and loss account. Friedman (1970) famously supported this classical view of business objectives by stating that the sole reason for a firm's existence is to maximise the wealth of the shareholders, and that any act of philanthropy equates to stealing from the shareholders' wealth. However, the neglect by oil and gas companies in Nigeria of the negative externalities arising from the pursuit of economic objectives along with various environmental abuses by companies have created negative attitudes among stakeholders towards business.

Moreover, the Proponents of environmental accounting argue that the use of environmental accounting is very important while others were of the opinion that it does not. Interestingly, Adams (1998) acknowledges that the use of environmental accounting has gained consensus among the developed countries because it allows companies to reduce the level of degradations on the environment which in turn lead to the reduction in the level of penalties and fines, and other social costs. It makes companies to be socially responsible to the society. Howbeit, available evidence suggests that the neglect of the environment in Nigeria have been enormous (Enahoro, 2009; Kuratin, 2011; Ayoola 2011). This according to Enahoro (2009) has necessitated local groups to declare force majeure on oil shipments and to engage in various heinous crimes such as oil theft commonly referred to as bunkering, pipeline damage, abduction of oil workers and forcing companies to shut in production. Federal Environmental Protection Agency-FEPA (2011) report shows that since December 2005, Nigeria has experienced increased pipeline vandalization, kidnappings and militants' takeovers of oil facilities in Niger Delta. Despite the above observations some researchers such as Hossain, Islam and Andrew (2016) Agyapong and Nuertey (2017) strongly kicked against spending on the environment stating that businesses" expenditure on the environment affect businesses bottom line. Friedman (1970) claimed that environmental expenditure is a diversion of funds from positive projects.

In order to achieve the broad objective of this study, the following tentative statements were made and stated in null form;

- $H0_1$: There is no significant effect of Environmental Pollution Prevention Costs on the financial performance of quoted oil and gas companies in Nigeria.
- $H0_2$: Environmental detection costs has no significant effect on the financial performance of quoted oil and gas companies in Nigeria.
- $H0_3$: Environmental Internal failure cost has no significant effect on the financial performance of quoted oil and gas companies in Nigeria.
- $H0_4$: There is no significant effect of Environmental External failure cost on the financial performance of quoted oil and gas companies in Nigeria.

This study provides researchers and non-researchers, stakeholders and Shareholders such as; regulators, policy makers, and the entire public on the effect of environmental accounting cost on financial performance of oil and gas industry in Nigeria. The study is for the period of 21 years (2000 – 2020). It is against this background that the study seeks to examine the effect of environmental accounting costs on financial performance of selected listed companies in Nigeria.

II. REVIEW OF RELATED LITERATURE

This section of the paper focused on the conceptual review, theoretical review and review of a related empirical studies.

2.1 Conceptual Review

Environmental Accounting Costs

Agbiogwu (2016) sees environmental accounting as the process of communicating the environmental effects of organization's economic actions to particular interest group that is found in the society as well as the society itself in general. It is a process that enables an organization to identify the cost of environmental conservation while engaging in normal course of business, identify benefits gained from such activities, to bring about the best possible ways of quantitative measurement (in monetary value or physical units) and support the dissemination of its results (Environmental Accounting Guidelines, 2005; Pramanik, Shil and Das, 2007; Magara, Aminga and Momanyi, 2015). Environmental accounting involves the identification, measurement and allocation of environmental costs, and the integration of these costs into business and encompasses the way of communicating such information to the company's stakeholders (Gray, Bebbington and Walter, 1993; Bassey, Effiok and Eton, 2013). It is a management tool that can be used for various purposes, for example, improving environmental performance, costs controlling, investing in cleaner technologies, greener processes and product development, and taking decisions that pertain product mix, product retention, and product pricing (Uwuigbe, 2011). Charles, John-Akamelu and Umeoduagu (2017) opined that environmental costs are costs which are incurred by organizations for the purpose of protecting the environment, the prevention of environmental problems, and also to minimize damages that the environment may suffer.

According to Kamieniecka and Nozka (2013), environmental accounting also known as green accounting is a management tool addressing all areas of accounting that may be affected by the response of business organizations to environmental issues, including the new area of eco-accounting. It is an essential exercise necessary for the replenishment of the environmental losses due the activities of various business outfits within the environs.

There are several reasons environmental issues should be incorporated into the companies' Annual Reports. Some of them include;

Environmental Accounting may lead to the avoidance of penalty or fines imposed by the Environmental Protection Agency in the countries where such legislation exists, Environmental Accounting promotes research and development which will eventually translate into a significant reduction in many environmental costs through the design of more environmentally friendly production process. (Medley 1997), Environmental Accounting can attract more investors because investors sometimes need information on environmental performance and expenditure to make decisions; Environmental Accounting can promote more accurate costing and pricing of the product, Environmental Accounting may attract incentives from the government in form of tax reduction and subsidies and Environmental Accounting can lead to the development of the Environment Management System (EMS) which is necessary for companies engaged in International Trade. (Hutchinson 2002; Lethmathe & Doost 2000).

Environmental Pollution Prevention Cost

Pollution prevention (P2) is the cost of reduction or elimination of wastes and pollutants at their sources. It can also be the cost of avoiding, manage, treat, dispose of, or clean up a particular. P2 can encompass activities such as: redesigning products to cause less waste or pollution during manufacture, use, or disposal altering production processes to minimize the use of toxic chemicals, implementing better housekeeping practices to minimize leaks and fugitive releases from manufacturing processes, taking steps to reduce energy consumption Pollution prevention within industry generally receives the most attention. However, P2 efforts in other sectors are equally important. For example, planting pest-resistant crops can reduce or eliminate the need for chemical pesticides, thereby reducing the water, air, and soil pollution that results from the manufacture and use of agricultural chemicals. In office settings, simple steps such as making double-sided copies and printing drafts on the back sides of discarded paper can substantially reduce the consumption and disposal of paper products. In the home, minimizing the use of toxic household chemicals such as drain cleaners and herbicides will reduce the amount of hazardous chemicals that eventually end up in the environment. The range of P2 opportunities is constrained only by the limits to our imagination and ingenuity, and the strength of our commitment to improving our relation-ship with the environment (Environmental Solutions, 2005). Environmental Pollution prevention cost was measured as Cost of reduction or elimination of wastes or pollutants at their sources.

Environmental Detection Costs

Environmental detection costs are costs resulting from activities to determine if products, processes and other activities within the company are in compliance with appropriate environmental standards. The costs include auditing environmental activities, inspecting products and processes, developing environmental performance measures, testing contamination and measuring contamination level (Bassey, Usang & Edom, 2013). The environmental standards and procedures that a firm seeks to follow are defined in three ways: (1) regulatory laws of Governments, (2) voluntary standards (ISO 14001) developed by the International Standards Organization, and (3) environmental policies developed by management , Examples of activities are auditing environmental detection activities, inspecting products and processes (for environmental compliance), developing environmental performance measures, carrying out contamination tests, verifying supplier environmental performance, and measuring levels of contamination. Environmental Detection costs was measured as costs of activities executed to determine if products, processes, and

other activities within the firm are in compliance with environmental appropriate standards.

Environmental Internal Failure Costs

Environmental Internal failure costs are costs of activities performed because contaminants and waste have been produced but not discharged into the environment (Bassey, Usang & Edom, 2013). These are cost of making good contaminations and waste that have been discharged by the firm during production of goods and services, though at this level the waste or pollution so far has not been discharged into the public environment. Costs of maintaining pollution equipment and treating toxic wastes will fall under this category (Adejola, 2013). United Nations Division for Sustainable Development (UNDSD) (2001) defined environmental internal failure cost as costs incurred from performing activities that have produced contaminants and waste that have not been discharged into the environment. Internal failure costs are incurred to Eliminate and manage contaminants or waste once produced. Internal failure activities have one of two goals: (1) to the Ensure that the contaminants and waste produced are not released to the environment or (2) to reduce the level of contaminants released to an amount that complies with environmental standards. Examples of activities include internal failure of operating equipment to minimize or eliminate pollution, treating and disposing of toxic materials, maintaining pollution equipment, licensing facilities for producing contaminants, and recycling scrap (Bassey, Usang & Edom, 2013). Environmental internal failure was measured as incurred to Eliminate and manage contaminants or waste once produced.

Environmental External Failure Cost

These are costs of activities performed after discharging contaminants and waste into the environment. These costs are those for cleaning up a polluted lake, clearing up oil spills, cleaning up contaminated soil, settling personal injury claims which are environment related, restoring land to natural state, among others. The need for environmental accounting is to enhance and further drive for the benefit of eco-efficiency which maintains that organizations whose activities adversely affect the environment can carry out their activities of production while simultaneously reducing negative environmental impacts, resource consumption and costs. According to Van (2011), Environmental external failure costs are costs incurred by firms in remediation of its failure to forestall harm from occurring to the environment in its production activities. A good example of this type of environmental cost is costs of clearing oil spill or cleaning polluted river. However, costs incurred in the settlements of fees and fines arising due negligence or not observing certain legislations on environmental pollution including compensations paid to third parties cannot be attributed to this category. Environmental external failure cost was measured as costs of activities performed after discharging contaminants and waste into the environment.

Financial Performance

Performance referred to in this study is the financial performance of the firms under consideration. According to Ondieki (2011), financial performance is the term adopted in the general assessment of the complete financial condition of an organization within a specified period of time such that can be used to make comparisons with other firms in the same industry. For the purpose of this study, we used Return on Equity (ROE): which is a measure of a company's annual return (net income) divided by the value of its total shareholders' equity, expressed as a percentage (e.g., 12%). Alternatively, ROE can also be derived by dividing the firm's dividend growth rate by its earnings retention rate (1 – dividend payout ratio). Also, Return on Equity is a two-part ratio in its derivation because it brings together the income statement and the balance sheet, where net income or profit is compared to the shareholders' equity. The number represents the total return on equity capital and shows the firm's ability to turn assets into profits. To put it another way, it measures the profits made for each dollar from shareholders' equity. (Marshall Hargrave 2019).

2.2 Stakeholders Theory Review

This study is anchored on the stakeholders' theory, first propounded by Mitroff in 1983 and formulated by Edward Freeman (1984) in his book "Strategic Management." Freeman (1984) defined stakeholders as any individual or group who has an interest in the firm because he (or she) can affect or is affected by the firms' activities. Carroll (1999) has defined stakeholders as any individual or group who can affect or is affected by the actions, decisions, policies, practices, or goals of the organization. Stakeholders can be identified by the legitimacy of their claims, which is substantiated by a relationship of exchange between themselves and the organization. Hence, stakeholders include stockholders, creditors, managers, employees, customers, suppliers, local communities, and the general public. Stakeholders' theory assumes that an organisation will respond to the concerns and expectations of powerful stakeholders, and some of the response will be in the form of strategic disclosures. The relevance of Stakeholders' theory is that it provides a rich insight into the factors that motivate managerial behaviour in relation to the social and environmental disclosure practises of an organization. Previous social and environmental accounting research which utilised these theories indicates that organisations respond to the expectations of which they operate through the provision of social and environmental information within their annual reports. At this point, organisations need to take care of the environment from which they draw resources by ensuring that the environment is conducive and healthy.

This work is anchored on the stakeholders' theory because of the link and role it has with the work. The stakeholder theory assumes that an organisation will respond to the concerns and expectations of powerful stakeholders, and some of the response will be in the form of strategic

disclosure. Organizations need to take care of the environment in which they draw resources from by ensuring that the environment is conducive and healthy. There is always a conflict between the stakeholders and the public interest. Stakeholders are interested in profit, while the public is interested in a conducive and healthy environment. The stakeholder theory maintains that firms have a stewardship role towards a variety of stakeholders, different from shareholders. These include creditors, customers, suppliers, host community, government, future generations, etc. A firm understands the role the customer, the environment, and the host community play towards the success of a firm.

2.3 Empirical Review

Onyekachi, Ihendinihu & Azubike (2020), assessed the effect of environmental investments on the earnings of listed oil and gas firms within the Nigerian economy over a ten year period (2008-2017). *Ex-posit facto* research design was adopted and secondary data were sourced from the financial reports of the five selected firms. Data analysis was conducted using the ordinary least square regression method and findings indicate that firms investments on the environment associates significantly with their earnings. Hence the study recommended for all business units in Nigeria to keep pace with contemporary financial reporting issues by engaging in, and adequately reporting their investments in the replenishment of the planet as that will promote their organizational image and business. The study also noted that there is a gap in the reporting of environmental activities of firms largely drawn from unavailability of the global accounting standard to ensure accountability and harmonization of environmental reports; and so called on the International Accounting Standards Board to deliver a dedicated standard to fill this gap thus enabling the accounting profession to effectively contribute its quota towards a sustainable planet.

Adegbei & Nwobodo (2020), examined Environmental Accounting & Reporting Practices: Significance and Issues: A Case listed Deposit Money Banks (DMBs) in Nigeria. The primary data were collected from the total number of 34 Accountants, taking two from each company. The findings shows that EAR practices in DMBs is highly significant but not too satisfactory as there are many issues hindering them from carrying out best practices in EA and ER and hence poor in real sense of the term. Therefore, in order to improve the EAR practices in the DMBs, the proper authority need to implement the suggestions put forward by the respondents without any further delay.

Chiamogu & Okoye (2020), examined the extent environmental cost affects financial performance of oil and gas companies in Nigeria. Ex post facto research design was employed and data was obtained from annual reports and accounts for the periods 2011 to 2018. The hypotheses were tested using regression analysis with aid of e-view 9.0. The results of the empirical data analysis revealed that community development cost and environmental remediation cost has positive significant effect on Tobin's. The study therefore recommended among others that government should give tax credit to organizations that participate and contribute towards community development in order to encourage community development and which would go a long way in enhancing firm performance.

Adesina (2020), investigated the evaluation of environmental accounting and its impact on the sustainable economy in Nigeria. The study was narrowed to the 3 selected manufacturing companies (Portland Paint and Product, Bevpak and Premier Feed Mills Nigeria ltd) located in Ibadan metropolis, Oyo State. The primary source of data was used and out of two hundred (150) questionnaires that were distributed, 136 were received and only 124 fully filled were used in data analysis with the use of simple percentage and Chi-Square statistical tool. The major result of the hypothesis tested showed that environmental accounting as a significant effect on sustainable development with (X2cal (16.65) > X2tab (16.65) at significant level 0.05) and also enhance the life of the citizen with (X2cal (16.65) > X2tab (16.65) at significant level 0.05). Findings from the analysis of the data indicated that environmental accounting has enhanced sustainable development by reducing the environmental impact while increasing the value of an enterprise, satisfying human needs, contributing to the quality of life, and resource intensity. To this end, it is recommended that there is need for government to impose a restriction on the release of a toxic substance into the environment and stipulating the requirement which industries and facilities generating waste must meet.

Iliemena (2020), investigated the effect of environmental accounting practices on corporate performance of listed oil and gas companies in Nigeria, 2012-2018. Ex-post facto research design was employed in the study and the analysis carried out using simple linear regression. Findings reveal environmental accounting practices and accounting have significant positive effects on both turnover and Return on capital employed; while the effect on net profit even though positive, was insignificant. The study concluded that, environmental accounting has significant positive effect on corporate performance of practicing companies. It was therefore recommended amongst others that corporate organizations should extend their management accounting and financial reporting systems to environmental accounting as a way of ensuring long-run corporate sustainability.

Falack, Adiga, Shaki & Bassey (2020), focused on environmental reporting and corporate performance with particular reference to listed oil and gas companies in Nigeria. The study adopted the ex-post facto design and data was sourced from the published financial reports of 6 listed oil and gas companies out of the 12 quoted oil and gas companies. Ordinary least square was used in analyzing the data using Minitab 17. The findings revealed that environmental protection, development and safety cost has a negative but significant relationship with ROA. More also, environmental protection, development and safety cost showed a negative

and insignificant relation with EPS. The study recommends that oil firms should provide comprehensive reports of their environmental involvement and also government and stakeholders should be concern and mandate compliance to standards regulating and mandating firms to report environmental accounting satisfactorily.

Oshiole, Elamah and Ndubuisi (2020), ascertained the effect of environmental cost disclosure on profitability of oil and gas firms listed on Nigeria Stock Exchange between 2010 and 2019. Eleven (11) listed oil and gas firms were purposively sampled. The proxies for environmental cost disclosure include waste management cost disclosure, Environmental External failure cost disclosure and environmental remediation cost, while net profit margin was employed as profitability measure. Content analysis was employed while Pearson Correlation Coefficient and Panel Least Square (PLS) Regression analysis via STATA 13 statistical software were used to test the hypotheses of the study. The result of this study showed that waste management cost disclosure, Environmental External failure cost disclosure and environmental remediation cost disclosure have a significant positive effect on net profit margin at 5% level of significance respectively. This study therefore recommends inter alia that since environmental cost is value relevant in making strategic business decision. Thus, oil and gas firms should constantly reposition their accounting system in order to provide information on environmental cost so that the true costs in an organization can be ascertained and properly allocated.

Nwaimo (2020), examined the effect of environmental costs on performances of quoted firms in Sub Saharan Africa. The study adopted longitudinal/panel ex-post facto research design and random sampling technique while quantitative secondary data covering 2007 to 2016 were obtained for sixty-four extractive and industrial firms quoted in the Stock Exchanges of four Sub-Sahara African countries namely South Africa, Nigeria, Ghana and Tanzania. The models for the study were estimated using Ordinary least square regression (OLS) built on panel data analysis. In the regional level analysis as well as in South Africa and Nigeria specific country analyses, the study revealed that environmental costs represented by employee health and safety, waste management and Environmental detection costs have no significant effect on return on capital employed, earnings per share and return on equity. The study showed that in Ghana, the predictor variables demonstrated significant effect on return on capital employed and return on equity while only waste management cost has significant effect on return on capital employed and return on equity in Tanzania. The implication of the preponderance of the findings, save for the aforementioned exceptions in Ghana and Tanzania, is that quoted firms in the region are yet to adequately indulge in environmental responsibility or their environmental engagements are not adequately captured and disclosed to the extent that can cause significant swings in the measures of firm performance. The implication of the exceptions found in Ghana and Tanzania is that of comparative improvement in environmental responsibilities, compliances and disclosures by quoted firms in the two countries. The study recommended among other things that firms in Sub Saharan Africa should give greater attention to environmental responsibility, cost recognition, classification and disclosures in the annual, integrated and sustainability reports.

Onuora & Chiedu (2019), investigated the effect environmental cost on financial performance of oil and gas companies in Nigeria. In the study, they selected the sample of seven (7) listed oil and gas companies at Nigeria stock change. The data was collected for two years each financial statements for the seven listed oil and gas companies 2017 and 2018. The study applied ordinary list square and regression analysis in testing the formulated hypothesis. The study revealed that environmental costs have no significant effect on gross profit margin (GM) and environmental cost has significant effect on returned on capital employed. Based on the findings, the study recommends that management of oil and gas companies should continue to engage in incurring environmental costs accordingly as well, since they do not have any significant effect on financial performance.

Iliemena & Ijeoma (2019) examined the effect of Sustainability reporting on financial performance of manufacturing firms quoted on the Nigerian stock exchange using secondary data from annual reports and accounts of 24 sampled quoted manufacturing companies. The study period ranged from 2012 to 2018 which represents IFRS reporting period in Nigeria. The three hypotheses formulated were tested using regression analyses at 5% level of significance. Findings reveal among others that there is no significant effect of environmental disclosure on return on capital employed (ROCE

Agboola & Ayodeji (2019), examined Environmental Cost and Financial Performance: Analysis of Cement Companies in Nigeria. Regression analysis was adopted with the aid of Statistical Package for Social Sciences (SPSS) so as to determine the correlation between the two variables. The study found that Environmental Cost Savings was significantly related to Financial Performance of the quoted cement companies. The study concluded that Environmental cost Savings positively impacted on the business value of the companies and therefore recommends that continues investment in Environmental Cost Savings will yield a strong relationship to financial performance of the companies and should be considered as significant stimulant of financial performance.

Nyirenda, Ngwakwe and Ambe (2018) examined the impact of environmental management practices on the financial performance of a South African mining firm. Using multiple regression statistics, the return on equity of Green-Steel is regressed on three environmental management practices of Green-Steel (carbon reduction, energy efficiency, and water usage). The result showed there is no significant relationship between the variables and this lends credence to

information gathered from Green-Steel environmental reports that Green-Steel's environmental management practices are driven mostly by a desire to abide by regulations and also by a moral obligation to use environmental management practices to mitigate climate change impact.

Nwaiwu and Oluka (2018) examined the effect of environmental cost disclosure and financial performance measures of quoted oil and gas companies in Nigeria. Pearson product moment coefficient of correlation and multiple linear regression analysis with the aid of special package for social sciences (SPSS) version 22. The econometric results reviewed adequate disclosure on environmental cost, compliance to corporate environmental regulations have positive significant effect on financial performance measures.

Hai, Foo, Tan & Yap (2018) investigated the relationship between environmental disclosures and financial performance using a sample of potentially polluting publicly-listed companies in Singapore from 2012-2015. The issue was examined from several perspectives: (a) if there is any difference in financial performance between disclosing and non-disclosing companies of environmental information, (b) whether extent of environmental disclosure can be linked to financial performance, and (c) if there is any impact of prior financial performance on subsequent environmental disclosures, and vice-versa. Results showed that a positive link existed although the evidence was less strong for the impact of environmental disclosures on subsequent financial performance. All null hypotheses were rejected. This finding should encourage Singapore companies to increase the content of their environmental reporting in annual reports. This is important in order to expose pollution-prone companies to a wider spectrum of stakeholders on their role to achieve a cleaner and greener environment.

Oti, and Mbu-Ogar, (2018) examined the impact of environmental and social disclosure on the financial performance of quoted oil and gas companies in Nigeria. Time series data for five years were collected and analyzed using the ordinary least square regression technique. The theoretical framework was hinged on stakeholder and legitimacy theories which describe the tie between organizations and the social/societal strata need for disclosure and financial performance. Results from the statistical analysis revealed that disclosure on employee health and safety and community development do not significantly affect financial performance while disclosure on waste management had a positive and significant effect on firm's financial performance. The study recommended that oil and gas companies should constantly review their waste management strategy and employ bespoke technology in waste management to mitigate their impact on the environment. Furthermore, Oil and gas companies should improve on employee health and safety as part of their mission and vision statement for enhanced firm value. Companies should also ensure sustained development of their host communities to avoid hostility by stakeholder groups which will have negative effect on its operations and in turn affects performance.

Okafor (2018) ascertained the effect of environmental costs on firm performance. To achieve the objective, the study made use of financial reports of Oil and Gas Companies quoted in the Nigerian Stock Exchange Market from years 2006-2015. Regression analysis was employed with the aid of Statistical Package for Social Sciences (SPSS). The results of the statistical analysis indicated that better environmental performance positively impact business value of an organization. Moreover, environmental accounting provides the organization an opportunity to reduce environmental and social costs and improve their performance.

Nyirenda, Ngwakwe, & Ambe (2018), examined the impact of environmental management practices on the financial performance of a South African mining firm. The major aim of the study was to investigate whether such practices have a close relationship with the mining firm's financial performance (represented by return on equity [ROE]). The approach was a case study of a South African mining firm listed under the socially responsible index (SRI) of the Johannesburg Stock Exchange (JSE). It uses Green-Steel (pseudonym used in place of the real name) as a case study. Using multiple regression statistics, the return on equity of GreenSteel regressed on three environmental management practices of Green-Steel (carbon reduction, energy efficiency, and water usage). The result showed there is no significant relationship between the variables and this lends credence to information gathered from Green-Steel environmental reports that GreenSteel's environmental management practices are driven mostly by a desire to abide by regulations and also by a moral obligation to use environmental management practices to mitigate climate change impact.

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 was determined from the population of 5705 drawn from management, middle and lower cadre of the selected manufacturing firms using Cochran (1977) statistical formula. Data were analyzed and the hypotheses were tested using linear regression analysis. 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.

Okoye and Adeniyi (2017), examined the effect of environmental protection costs on product price in Nigeria. A survey design was used for the study. Questionnaire was administered to generate data. Researcher employed purposive sampling technique in selecting the sample frame. The study focus on Brewing Industry located in Lagos State. The

population of the study consists of Management Accountaunts in Nigeria Brewing Plc, Guiness Plc, Coca – Cola Plc and Seven - Up Plc. The study discovered that there was negative relationship between environmental regulatory cost and product pricing decision. The study therefore recommend that company should design accounting system that will capture expenses incur on environmental matters. This will enable the firm to appreciate the amount they have invested in managing firm's waste and the cost incur to comply with environmental protection rules and regulations.

Agbo, Ohaegbu & Akubuilo (2017), examined n the effect of environmental cost on organizational performance of Nigerian brewery Plc. Data used for this study were obtained from the annual report of Nigerian brewery Plc on Donations (DN), Medical Expenses (ME) and on the Return on Asset (ROA) within a period of five for the years 2011 to 2015. Hypotheses were formulated and multiple regressions were used for the analysis. The findings of this study revealed that the environmental cost has significant implications on financial development on business outfits such a Nigerian Breweries Plc. It was found that both donation and medical expenses have a negative relationship (r = -0.068 and r =-0.072) respectively with return on assets (ROA). Trainings, Recruitment and Canteen Expenses (TRC) and the return on assets (ROA) have a positive relationship (r = 0.068) on Nigerian brewery Plc

Obara, and Nangih, (2017) examined Accounting practices and its affect on the profitability of Oil and Gas companies in Nigeria, particularly those in the upstream sector. The specific objectives were: to determine the effect of accounting practices on Return on Assets (ROA) and Return on Capital Employed (ROCE) of Oil and Gas Companies in Nigeria. The study objectives guided the empirical review. The Researchers used Stratified Sampling Design approach. The target population comprised of Oil and Gas Companies in Nigeria. A total of 84 respondents were drawn from the population. Both primary and secondary data were used in the study. Primary Data were collected using questionnaires drawn using the Likert's Scale with five points ranging from very great extent to no extent, while secondary data were sourced from already published materials. Hypotheses were formulated and data were analyzed using SPSS Software and other Descriptive statistical tools such as; percentages and tables. The result of the study showed that accounting practices had a significant relationship with performance of Oil and Gas Companies, particularly, the Return on Assets and Return on Capital Employed. It was recommended that proper and best accounting practices should be adopted by Oil and Gas companies to ensure better performance on one hand and fair, transparent and reliable financial reports on the other hand.

Pariag-Maraye, Ansaram and Ramkalawon (2017) examined the relationship between environmental management practices adopted by listed firms on the Stock exchange of Mauritius and their impact, if any, on their financial performance. A content analysis of annual reports of the listed companies over the period 2011 to 2014 to determine the level of environmental management systems (EMS) was implemented by the local firms. The results found that companies tend to be more environmentally conscious due to compliance rather than a voluntary basis or to reap corporate benefits.

Eilola (2017) examined the link between corporate environmental performance (CEP) and corporate financial performance (CFP) in the forest, paper and packaging industry and in the manufacturing of machinery and equipment industry. The study was conducted as a qualitative study although it includes also some quantitative elements. Data consisted of CEP disclosures, mainly corporate social responsibility reports and annual reports. Pearson's correlation coefficients were computed for CEP and CFP figure pairs. Differing from majority of earlier studies, this study indicates that there is no link between CEP and CFP – not from CEP to CFP nor CFP to CEP. The results indicated that companies are not punished for high environmental performance.

Azomahou, Van & Wagner (2017) examined the relationship between the environmental and economic performance of firms in the European paper manufacturing industry from 2011-2015. Hypotheses were tested using pooled regression and a panel regression framework with random firm and temporal effects. It was found that for the system with return on sales as economic performance variable, and an environmental performance index as environmental performance variable, a significant and positive regression coefficient was estimated for the asset-turnover ratio, as well as significant and negative coefficients for the dummy variables representing the industrial and mixed sub-sector.

Ezeagba, Akamelu, & Umeoduagu (2017), investigated the relationship of environmental accounting disclosures and financial performance of food and beverage companies in Nigeria. Specifically, Data for the study were collected through secondary sources and analyzed using Pearson's correlation statistical technique and multiple regression, with the aid of SPSS version 20. The study revealed that there is a significant relationship between environmental accounting disclosures and return on equity of selected companies. It also revealed a negative relationship between environmental accounting disclosures and return on capital employed and net profit margin of selected companies. Based on these findings, the researcher recommends among others, that firms should adopt uniform reporting and disclosure standards of environmental practices. This will enhance control and measurement of performance. The study also advocates that firms (especially smaller ones), should be encouraged to disclose their environmental practices in their annual reports in order to enhance their competitiveness which would subsequently, lead to higher corporate performance.

III. METHODOLOGY

The *ex-post-facto* research design was adopted for this study, Conoil, MRS Oil and Forte Oil was used as sample of the study out of eleven oil and gas listed companies, this was used due to the availability of data for period selected for the purpose of obtaining data for the study. The researcher used secondary source of data in the course of this study. Data collected from Annual Report of Conoil, MRS Oil and Forte Oil. This study adopted both the descriptive and inferential statistics in analysing the panel data. Descriptive statistics such as mean, median, standard deviation among others were computed on the data collected from the secondary sources. While in order to empirically estimate the effect of explanatory variables on the dependent variable, panel regression model was used to estimate extent of which the financial performance of oil and gas companies is influenced by environmental accounting cost.

The multiple linear regression is used to describe the effect of a dependent variable and independent variables. The form of panel regression equation as stated in field (2005) and Asteriou & Hall (2017) is

$$ROE = \beta_0 + \beta_1 EPPC_{i,t} + \beta_2 ECDC_{i,t} + \beta_3 EHRMC_{i,t} + \beta_4 EHSC_{i,t} + \mu_{i,t}$$

Where;

ROE = Return on equity
EPPC =Environmental Pollution Prevention Costs
EDC = Environmental Detection costs
EIFC =Environmental Internal Failure Cost
EEFC =Environmental External Failure Cost
β_o = Intercept.
$\beta_1 - \beta_4$ = Coefficients or parameters to be estimated.
μ= error term
i = firms
t = time

Table 1: Variables Measurement

Variable Acronym	Variables Name	Variable Measurement
ROE	Return on equity	measure of a company's annual return divided by value of its total shareholders' equity as a percentage.
EPPC	Environmental Pollution Prevention Costs	Cost of reduction or elimination of wastes or pollutants at their sources.
EDC	Environmental Detection costs	costs of activities executed to determine if products, processes, and other activities within the firm are in compliance with environmental appropriate standards.
EIFC	Environmental Internal Failure Cost	incurred to Eliminate and manage contaminants or waste once produced.
EEFC	Environmental External Failure Cost	costs of activities performed after discharging contaminants and waste into the environment.

Source: Author's computation, 2022.

IV. RESULTS AND DISCUSSIONS

Table 2: Descriptive Statistics

	ROE	EPPC	EDC	EIFC	EEFC
Mean	17.77	2022818.	3147635.	1337756.	6270075.
Median	10.80	23352.00	3147635.	1239223.	2190000.
Maximum	88.04	19740931	5838838.	3145971.	1.48
Minimum	0.57	0.00	456432.0	296428.0	200000.0
Std. Dev.	20.30	3609308.	1591309.	725426.3	18624985
Skewness	2.04	2.70	-8.06	0.549688	7.16
Kurtosis	6.36	11.66	1.80	2.163128	54.97
Jarque-Bera	73.19	273.73	3.783811	5.011077	7627.91
Probability	0.07	0.06	0.150784	0.081632	0.12
Sum	1119.45	1.27	1.98	84278618	3.95
Sum Sq. Dev.	25555.11	8.08	1.57	3.26	2.15
Observations	**63**	**63**	**63**	**63**	**63**

Source: Author's computation, 2022.

As it is presented in the table, it includes the mean, standard deviation, number of observations, minimum, maximum, skewness and kurtosis for the dependent and independent variables of the model. It shows the average indicators of variables computed from the Nigeria Stock Exchange (NSE) Financial report.

As shown in methodology, Financial Performance was measured by Return on Equity (ROE) which in turn calculated as profit before tax divided by total owners Equities has minimum value of 0.57 and maximum value of 88.04, this indicate that oil and gas company under study has a minimum profit of N57B and maximum profit before tax of N88.04T. The mean value of ROE is 17.77. This means that the oil and gas company under study earned an average profit before tax of 17.77 for every 100% worth of total owners' equities. The standard deviation, which measure deviation of firm data from mean, is 20.30, this signifying that data deviate from mean by about 12%. The coefficient of skewness is 2.04. It reveals that data is normally skewed and thus; the data meets the symmetrical distribution assumption and kurtosis value at 6.37.

The tables 2 also show that Environmental Pollution Prevention Costs (EPPC) of oil and gas industries has minimum value of 0.00 and maximum value of 19740931. The mean value of EPPC of the sampled oil and gas industry in the study period is 2022818. The standard deviation of EPPC is 3609308, which indicate that data deviate from mean by approximately 44%. The coefficient of skewness is 2.702147 and it reveals that data is normally skewed and thus; the data meets the symmetrical distribution assumption and kurtosis value at 11.66442.

The tables 2 also show that Environmental Detection costs (EDC) has minimum value and maximum of 200000.0 and 148000000 respectively. The mean of EDC of the sampled companies in the study period is 6270075. The

standard deviation of EDC is 18624985, which indicate that data deviate from mean by approximately 67%. The kurtosis value of 54.96753 suggests that distribution of the data is leptokurtic. Similarly, the coefficient of skewness at 7.16 implies that the data is slightly positively skewed.

The tables 2 also show that Environmental Internal Failure Cost (EIFC) has minimum value and maximum of 296428.0 and 3145971 respectively. The mean of EIFC of the sampled companies is 1337756 and the standard deviation is 725426.3, which indicate that there is dispersion from the mean value. The coefficient of skewness at 0.55 signifies that data is normally skewed and therefore, conforms to the symmetrical distribution requirement and the kurtosis value at 2.16.

The tables 2 also show that Environmental External Failure Cost (EEFC) has minimum value and maximum of 456432 and 5838838 respectively. The mean of EEFC of the sampled companies is 3147635 and the standard deviation is 1591309, which indicate that data deviate from mean by approximately 49%. The coefficient of skewness at -8.06 signifies that data is negatively skewed and the kurtosis value at 1.80.

Table 3 Correlation Analysis

VARIABLES	ROE	EPPC	EEFC	EIFC	EDC
ROE	1.0000	-0.1497	-0.2447	-0.0030	-0.0431
EPPC	-0.1497	1.0000	-0.0777	-0.0033	0.0425
EEFC	-0.2447	-0.0777	1.0000	0.1148	0.2001
EIFC	-0.0030	-0.0033	0.1148	1.0000	0.2212
EDC	-0.0431	0.0425	0.2001	0.2212	1.0000

Source: Author's computation, 2022.

The values in the table 3 above indicate the strength of the correlation coefficients for the variables of the study. The table indicates that Environmental Pollution Prevention Costs (EPPC), Environmental Detection Costs (EDC), Environmental Internal Failure Cost (EIFC) and Environmental External Failure Cost (EEFC) with values of 15%, 4%, 0.3% and 24% respectively have negative correlations with Return on Equity (ROE) of the sampled oil and gas companies under study. Which means that negative relationship exists between the Dependent variable (ROE) with all the independent variables (EPPC, EDC, EIFC and EEFC). By implication the dependent and independent variables move in a different direction.

Table 4. Shapiro-WIlk Normality Test for Model

Tests of Normality			
	Shapiro-Wilk		
	Statistic	Df	Sig.
EPPC	1.627	63	.062
EIFC	1.919	63	.201
EEFC	1.255	63	.072
EDC	2.250	63	.764
ROE	1.701	63	.059

Source: Author's computation, 2022.

Shapiro-wilk test was carried out in order to verify normality of the variables used in this study. A significant P-value indicates the probability that the null hypothesis of the normality is true. The null hypothesis for Shapiro-Wilk test is H_0: Data follow a normal distribution at .05 level of significance. From the table 4.3 above it can be seen that the data distribution follows a normal distribution as required. From the table, it can be seen that the P-value of all the variables used is greater than 0.05. Therefore, we accept the null hypothesis of normal distribution and conclude that the data for the model is normally distributed, and thus the findings from the analysis of the model could be used for inferences.

Table 5: Regression Result

Dependent Variable: ROE				
Method: Panel Least Squares				
Sample: 2000 2020				
Periods included: 21				
Cross-sections included: 3				
Total panel (balanced) observations: 63				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EPPC	-3.06	6.99	-0.44	0.6629
EEFC	2.25	5.38	4.18	0.0001
EIFC	1.02	4.12	2.48	0.0162
EDC	6.18	1.29	0.48	0.6344
C	75.09	14.65	5.13	0.0000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.285941	Mean dependent var		17.76905
Adjusted R-squared	0.209435	S.D. dependent var		20.30220
S.E. of regression	18.05144	Akaike info criterion		8.728768
Sum squared resid	18247.86	Schwarz criterion		8.966894
Log likelihood	-267.9562	Hannan-Quinn criter.		8.822424
F-statistic	3.737482	Durbin-Watson stat		1.283106
Prob(F-statistic)	0.003388			

Sources: Author's computation, 2022.

The Fixed Effect regression result show that this study model is fit as evidenced by F-statistics value of 3.737482, which is significant at 5% level of significant given p-value 0.003388. According to Lawal Muhammed (2016) model can be say to be fit only if F-statistics value is above 1.96 approximately 2. From the Table 5 above, it indicates that the model is fit enough to explain the effect of Environmental Accounting cost on the financial performance of oil and gas industry in Nigeria.

The R-square within is the coefficient of determination which shows the intra relationship amongst

environment accounting cost proxies and return on Equity of oil and gas industry in Nigeria. The overall value of R-square signifies overall predictive power of the model in explaining proportion of variation in dependent variable course by independent variables. From the table above the value of R-square within is 0.285941, which means that 28.5% variation in return on equity of oil and gas companies is explained by environmental accounting cost while remaining 71.5% is explain by other variables which is captured by error term or which are not captured in this study.

Environmental Pollution Prevention Costs and Financial Performance

From Table 5, Financial Performance (proxied by Return on Equity) and Environmental Pollution Prevention Costs can be represented by the equation ROE = 75.09 + (-3.06) which implies that an increase in Environmental Prevention Costs by one percent will decrease return on equity by (3.06) holding other variables constant. Moreover, Environmental Pollution Prevention Costs records t-statistic with value of -0.44 and associated Prob. of 0.66, which is non-significant at 5% level of significance. In light of this finding there is evidence to accept the null hypothesis. Therefore, since P-value (0.66) is greater than 5% level of significance, we accept the null hypothesis and conclude that there is no effect of Environmental Pollution Prevention Costs on the Financial Performance of quoted oil and gas companies in Nigeria

Environmental Community Development Cost and Financial Performance

From Table 5, Financial Performance (proxied by Return on Equity) and Environmental detection costs can be represented by the equation ROE = 75.09 + (6.18) which implies that an increase in Environmental detection costs by one percent will decrease return on equity by (6.18) holding other variables constant. Moreover, Environmental detection costs records t-statistic with value of 0.48 and associated Prob. of 0.63, which is non-significant at 5% level of significance. In light of this finding there is evidence to accept the null hypothesis. Therefore, since P-value (0.63) is greater than 5% level of significance, we accept the null hypothesis and conclude that Environmental Detection Costs has no significant effect on the Financial Performance of quoted oil and gas companies in Nigeria.

Environmental Internal Failure Cost and Financial Performance

From Table 5, Financial Performance (proxied by Return on equity) and Environmental Internal failure cost can be represented by the equation ROE = 75.09 + (1.02) which implies that an increase in Environmental Internal failure cost by one percent will increase return on equity by (1.03) holding other variables constant. Moreover, Environmental Internal failure cost records t-statistic with value of 2.48 and associated Prob. of 0.02, which is significant at 5% level of significance. In light of this finding there is evidence to reject the null hypothesis. Therefore, since P-value (0.02) is less than 5% level of significance, we reject the null hypothesis and accept the alternative, and thus conclude that Environmental Internal failure cost has significant effect on the financial performance of quoted oil and gas companies in Nigeria.

Environmental External Failure Cost and Financial Performance

From Table 5, Financial performance (Proxied by Return on Equity) and Environmental External Failure cost can be represented by the equation ROE = 75.09 + (2.25) which implies that an increase in Environmental External failure cost by one percent will increase return on equity by (2.25) holding other variables constant. Moreover, Equity and Environmental External failure cost records t-statistic with value of 4.18 and associated Prob. of 0.0001, which is significant at 5% level of significance. In light of this finding there is evidence to reject the null hypothesis. Therefore, since P-value (0.0001) is less than 5% level of significance, we reject the null hypothesis and accept the alternative and conclude that there is a significant effect of Environmental External failure cost on the financial performance of quoted oil and gas companies in Nigeria.

V. CONCLUSION AND RECOMMENDATIONS

The study examined the effects of environment accounting costs on the financial performance of selected quoted oil and gas companies in Nigeria from 2000-2020; The data were sourced from the Nigeria exchange group annual report and analysed using multiple regression model involving ordinary least square method. The result of the test conducted revealed that all the environmental accounting cost variables have a joint effect with the financial performance indicator of oil and gas companies in Nigeria (as evident by the F-statistic prob. value of (0.003388) which is less than 5% significant level). By implications, if the variables are not identified and improved upon, the challenges facing environmental accounting cost on the financial performance of the companies may persist and may lead to sub optimal performance and failed vision. It was therefore recommended that management of petroleum companies in Nigeria should formulate and implement consistent environmental policies like immediate removal of pollution or contaminants from the environment; and companies should provide comprehensive reports of their environmental engagement and government should mandate compliance to Standard regulation and reporting of environmental cost genuinely. Again, the management of petroleum companies should continue to put more fund on internal failure cost in other to ensure continuous reduction of contaminants in the environment to an amount that complies with environmental standards. Adequate policies and measures should be put in place enable companies. Furthermore, management should adopt measures and policies that will ensure that costs resulting from external failure such as; environmental degradation and adverse impact on the property or welfare of

individuals are given priority. It was envisaged that if all these are put to place it will invariably improve environmental accounting cost concept and ultimately, the financial performance of oil and gas companies in Nigeria.

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