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EFFECT OF ENVIRONMENTAL COSTS ON FINANCIAL PERFORMANCE OF CEMENT COMPANIES IN NIGERIA

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Abstract

This study on effect of environmental costs on financial performances of listed cement companies in Nigeria was carried to ascertain the effect environmental costs have on the performances of cement companies in Nigeria. The specific objectives of the study were to examine the effect of environmental costs on profit after tax of listed cement manufacturing companies in Nigeria, evaluate the effect of environmental costs on liquidity of listed cement manufacturing companies in Nigeria and ascertain the effect of environmental costs on net worth of listed cement manufacturing companies in Nigeria. Ex-post facto research design was adopted for the study since secondary sources of data were used. A sample of 10 listed cement companies was used to represent listed cement manufacturing companies in Nigeria. Secondary data were sourced from the published financial statements of the listed cement manufacturing companies and analyzed using regression. The hypotheses tested in the study were Environmental costs has no significant effect on profitability of cement manufacturing companies in Nigeria, Environmental costs have no significant effect on the net worth of cement manufacturing companies in Nigeria and Environmental costs have no significant effect on liquidity of cement manufacturing companies in Nigeria The findings of the study showed that environmental costs have significant effect on profit after tax, liquidity and net worth of listed cement manufacturing companies. Based on the findings of the study, it was then recommended that cement manufacturing companies in Nigeria should give close attention to issues of environmental cost as it has significant influences on their financial performances.

Keywords: Environmental costs, financial performance, Accounting

1.0 Introduction

Environmental cost can be defined as all costs incurred by organizations directly or indirectly to preserve the environment. Environmental costs involve all costs that are associated in managing the environment to prevent pollution and equally preserve the environment. These include waste management costs, environmental sanitation costs amongst others. Uzoh (2022) explain environmental costs as conservation, preservation, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster and other activities. Environmental costs are those incurred by companies directly or through third parties to prevent, reduce or repair damage to the environment arising from their operating activities. These are costs connected with the actual or potential deterioration of natural assets due to economic activities. Environmental cost can include clean-up cost, environmental fines, penalties and taxes, purchase of pollution prevention technologies, waste management costs etc.

Environmental cost accounting involves basic capacity in tracking appropriately and managing the flow of energy, water and materials resources, which comprise of pollution and waste volume etc. Environmental accounting cost when adequately managed, decreases legal obligation, improves financial accessibility, customer relationship, reduction in environmentally associated capital investments or/and yearly running cost which can improve profit margin or allow minor product / service prices and influence organization market value. Environmental accounting is also referred to as "green accounting" which has to do with the present generation's capacity to meet its demand without necessarily compromising or impeding the ability of future generation to do same (Onipe, 2018). It is an account aimed at achieving sustainable development, maintaining a favourable relationship with the community and pursuing effective and efficient environmental conservation activities.

Environmental related matters together with the associated costs are on the increase. These concerns have drawn attention of many institutions, organization and businesses in many countries across the globe (International Federation of Accountants-IFAC, 2005). Environmental activities of the firm can cause possible avoidance of environmental influence such as pollution cost, waste disposal costs, drainage costs and regulatory compliance cost that need protection through environmental policies (Nwanwu, 2022) There exist a general

concern that the conventional accounting policies and regulatory framework do not make better provision covering management of environmental information. Therefore, the need for an accounting information system that would meet this purpose will contribute in promoting the advancement of environmental accounting information system.

Businesses may be faced with intensified environmental pressure which might force them to devise new innovative and least cost methods to minimize and manage environmental issues. These pressures have resulted in increased environmental related costs such as environmental compliance, importance of pollution cost and material control, pollution checking and discharge fee, regulating paper work and reporting, site remediation and liability related insurance costs. Most organizations in recent time have recognize the possible financial rewards of better environmental improvement that aimed at enhancing productivity in target areas such as manufacturing sector, power sector and water resource management through savings or reduced cost of service and raw materials. Other benefits which are very strategic include capacity to project environmentally refined products and services known as "Green product and services" This require competency to react speedily and cost efficiently to meet an ever changing environmentally regulatory frame work. Tellus Institute (2008), stated that environmental and financial performance can be improved through physical and cost related information maintained by the organization which flow in both directly. This information when generated accurately and in more comprehensive form enhance decisions making and report environmental performance which assist in improving the statutes of the organization.

The indices of United Nations division for Sustainable Development Goal (UNSDG 2003), shows that in a perfect world, organizations would indicate environmental issues in their accounting practices by recognizing environmental cost imbedded in products, methods and services. Moreover, several conventional accounting practices have proven inadequate in handling environmental cost independently but rather characterize them under overhead. Accordingly, directors are ignorant of these costs, have less knowledge on its existence and show no concern in reducing the occurrence as they arise. Wilmshurt and Fort (2000) suggest that, refusal to restructure management accounting practices to integrate environmental issues and trepidations is unethical. Institutions and businesses will be ignorant of the environmental impacts

on profit and loss account and the financial position as a result of environmental associated activities. It is interesting that organizations have nowadays become gradually conscious of the environmental implication of their operations, products and services by entrenching and implementing environmental accounting information system. Since environmental risks can no longer be ignored, therefore businesses are now making it much a part of its operations just like product design, marketing and sound financial management.

Recently, organizational managers are conscious of the sustainability of their business and more prone to adopt environmental accounting. The idea of sustainability need acknowledgement that humankind have to live in an organized form within the bounds of the earth and secure control over resources and resounding ability over them (IFAC 2005). Core management accounting methods unlike investment appraisal requires both routine and strategic organizational decision to perform leading role under environmental accounting. Under investment appraisal, businesses are required to take account of all possible important and substantial cost together with environmental related costs that may disturb performance. According to Benneth, Bouma and Wolters (2009), environmental management do not only represent cost of business, but can also be frequently used to direct business benefits too. The need for management of organizations to preserve the environment and make it convenient for business operations cannot be over-emphasized. This is because for any business to flourish the interest of all stakeholders must be taken into consideration.

1.2 Statement of the problem

Environmental preservation in recent times has become a very important aspect of business operations. Businesses are being faced with intensified financial pressure from having to comply with environmental laws and regulations. These pressures have resulted in increased environmental related cost such as environmental compliance cost, social responsibility costs and liability related insurance costs. The question now is, can businesses really be able to manage these costs and exposures in such a way that financial performance is not hampered?

Experience has shown that conventional accounting system and practice cannot provide adequate accounting information that can help businesses combat these rising environmental costs and liabilities. The fact that expenditure/cost on environmental compliance related issues are buried under general overhead expenditure in most cases

and or cost of sales in other cases and not appropriately reported under conventional accounting systems deprives management of the needed information to tackle the environmental related costs. Due to this apparent inadequacy, businesses are now embracing and promoting the advancement of environmental accounting information that would adequately access, analyze and report environmental cost benefits to the organization. Environmental accounting information is now seen and applied as the live-wire for making important environmental cost/benefit decisions. Different scholars have tried to examine environmental cost on financial performance using different proxies, but none has considered the inclusion of net worth of organizations being influenced by environmental cost. This has created a gap thereby necessitating this study.

1.3 Objectives of the study

The main objective of the study was to examine the effect of environmental costs on financial performance of cement manufacturing companies in Nigeria. The following specific objectives were considered:

i. To examine the effect of environmental costs on profitability of the cement manufacturing companies in Nigeria
ii. To evaluate the effect of environmental costs on liquidity of cement manufacturing companies in Nigeria
iii. To determine the effect of environmental costs on the net worth of cement manufacturing companies in Nigeria

1.4 Research questions

To achieve the objectives of the study above, the following questions were asked by the researcher:

i. To what extend does environmental costs influences profitability of cement manufacturing companies in Nigerian?
ii. To what extend does environmental cost influences liquidity of cement manufacturing companies in Nigeria?
iii. To what extend does environmental cost influences the net worth of cement manufacturing companies in Nigeria?

1.5 Research hypotheses:

To be able to resolve the research problem, the researcher developed the following hypotheses for empirical testing:

Ho1: Environmental costs has no significant effect on profitability of cement manufacturing companies in Nigeria.

Ho2: Environmental costs have no significant effect on liquidity of cement manufacturing companies in Nigeria.

Ho3. Environmental costs have no significant effect on the net worth of cement manufacturing companies in Nigeria.

2.0 Literature review

2.1 Conceptual review

2.1.1 Environmental costs

Environmental costs involve all costs that are associated in managing the environment to prevent pollution and equally preserve the environment. These include waste management costs, environmental sanitation costs amongst others.

Environmental cost could be defined as conservation, prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities. The environmental impacts are the burden on the environment from business operations or other human activities and potential obstacles which may hinder the preservation of a favorable environment (UN2002).Uncovering and recognizing environmental costs associated with a product process, system, or facilitating important decisions for good management. Costs incurred to comply with environmental laws are clearly environmental costs and costs of environmental remediation, pollution control equipment, and non-compliance penalties are all unquestionably environmental costs (Eisner,2004).

Ofoegbu and Megbuluba (2016) stated that expenditures associated with causing, learning about, treating, and avoiding environmental degradation are environmental costs. They further mentioned that it helps to ensure that environmental sustainability is a core component of every corporate culture. Ifurueze et al. (2013) described environmental costs as having been expanded to include factors such as worker training, research and development, recycling, and product design for sustainability. The authors go on to say that environmental management systems (EMS) have developed as a way to systematically apply business management to environmental costs in order to improve a firm's long-term financial performance by creating procedures and goods that boost both competitive and environmental performance. They went on to say that using environmental expenses as a way to reduce organizational costs effectively is a very realistic strategy for providing managerial rationale for spending on environmental management systems

(EMS). Nwaiwu and Oluka (2018) described environmental expenses as environmental measurements and environmental losses, such as clean-up expenses, costs associated with resource recycling or energy conservation, closure costs, capital expenditures, and development expenditures. They continued by saying that environmental expenses result from operations that affect the environment and its consumers. There is also widespread worry that environmental costs limit operating flexibility and lower business output.

2.1.2 Environmental accounting

Environmental accounting is synonymous with Green accounting (Uzoh, 2023) Environmental accounting has evolved in recent years to become an increasingly interested means and system that management is using to account for the interaction between the firm and the environment and vice-versa. Regulating agencies at all levels of government are becoming increasingly interested in environmental protection at their various levels. These are shown and rigorously enforced through enactment of several environmental laws and regulations. According to Bassey, Effionk and Eton (2013), the environment is becoming a much more urgent economic, social and political problem. This goes to support the argument for a workable and practicable conceptualization of the subject of environmental accounting in order to provide a framework for accountants and practitioners to be able to assess the impact of the environment to the business.

Ramana (2002), states that environmental accounting serves as a tool for achieving company`s objectives, because it accounts for economic efficiency and environmental conservation activities. That management occasionally attempts to make suitable plans to protect the environment unless not required by act doing so has a long term economy value on the organization corporate existence. However, companies must account for most important external environmental influences and also determine their profitability at every accounting period as measurement Indies for performance analysis. Raouf (2002) elaborates a set of conceptual framework for environmental accounting to include subjects such as environmental, ecological and natural resources and green accounting.

Onipe (2018), states that environmental accounting is also referred to as "green accounting," which has to do with the present generation's capacity to meet its demands without necessarily compromising or impeding the ability of future generations to do the same. He

continued by stating that it is an art or science to assess organizational performance in relation to the objective, disclose it to internal and external stakeholders, and be responsible for its sustainable development. According to Norhasimah et al. (2016), environmental accounting can help communities preserve their relationships with one another while also achieving sustainable growth and development. They go on to say that it is an essential component of accounting that is growing and developing because societal forms are becoming more environmentally conscious, which raises the bar for monitoring the environment. They continued by pointing out that the International Organization for Standardization (IOS) had introduced the IOS 14,000 series of standards, which cover a variety of environmental management-related topics. This gave businesses useful tools to improve their environmental performance, which in turn increased productivity and success

2.1.3 Environmental costs and financial performance

An effective and efficient environmental accounting policy is reached by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts. The link between an environmental and a financial variable is achieved by measuring the environmental performance of an enterprise with respect to its financial performance (UNCTAD, 2003). Environmental accounting linking the environment and financial performance can be used to forecast the impact of environmental issues on future financial performance, thereby creating room for making informed investment decisions. Though, UNCTAD (2003) the problem with constructing environmental accounting indicators is that there are no agreed rules or standards for recognition, measurement and disclosure of environmental information either within the same industry or across industries. Most importantly, there are no rules for consolidating environmental information for an enterprise or for a group of enterprises so that it can be used together and in line with the enterprise's financial items. Adams (1998) as cited in Beredugo & Mefor (2012) found that there is no consensus either on accounting for environmental performance or on their standardization. The lack of comparability makes it impossible to either measure progress over time or compare the performance of one enterprise with other. Amidst this exposure, the United Nations Conference on Trade and Development (UNCTAD) which Nigeria

belongs advocated - the net value-added approach – a quantitative means of quantifying the relationship between the environmental performance of a company caused by its activities and economic performance i.e. the financial value produced by the same activities during a specific period.

In a nutshell, the ratio of environmental performance over financial performance is measured in monetary units. Denoted as:

$$VA = \frac{\text{Environmental performance}}{\text{Financial performance}}$$

Where environmental performance likened as Energy Consumption measured in units of gigajoules and financial performance: Value Added (Net Sales - Costs of Goods Purchased). This Information is useful in determining the ability of an enterprise to adapt to changes in the environment in which it operates (UNCTAD, 2003) as cited in (Beredugo & Mefor, 2012). Environmental information means any data on an item that relates to an environmental element, while financial information means any data on an item that relates to assets, liabilities, equity, income and/or expenses. Environmental information is measured in physical units, while financial information is measured in monetary units. Global Reporting Initiative (2001) as cited in Beredugo & Mefor (2012) specified that the ratio of environmental performance to financial performance should measure the environmental burden per unit of economic value.

2.2 Theoretical review

The two theories discussed in the study were the triple bottom line theory and the eco-efficiency theory, however the study was anchored on the triple bottom line theory

2.2.1 The triple bottom line theory

This theory was propounded by Elkingston in 1999, though similar to Adam Smith`s theory of the firm. The theory postulate that organizations must account for social and environmental performance in its process thereby increasing firms consciousness on environmental, social and economic activities that aimed at embracing life circle technology given room to social common group and restructure company authority, modify products and services to be more environmentally friendly and also ensure compliance with environmental rules and guidelines. Hart (1997) opine that the

achievement of environmental sustainability needs products and services accountability, pollution prevention and green technology were reformed firms would have advanced pollution control and reduce environmental cost.

According to Ballou, Heiger and Landes (2006), companies have recognized that ascertaining stakeholders need is crucial in maximizing the general strategic business objectives. They went further to assert that if achieving shareholders worth continue to be dominant anxiety, companies would not be fragile in meet other key stakeholderswelfares, post, Preston and Sachs (2002), submitted that firm market value increases in a sustainable form when critical stakeholder`s needs are meet.

Triple bottom down suggests a special recognition of businesses to the sustainable development of environmental performance matrix. According to Higgins (2001), quantifying and recording are organization`s bottom down (TBD) has emerge as a critical organizational procedure for organization to prove that their contributing to the society is appropriate in line with regulations. This study is anchored on this theory as it best relates to the subject under discussion

2.2.2 Eco-efficiency theory

According to Arbelo, Gomez, Gonzalez and Ramos (2014), the concept of eco-efficiency was raised during the second half of the 20th century in response to growing interest in the effect of economic growth on environment and the development of initiatives such as the Club of Room. Reports and scientific papers like The limits to Growth (Meadows, Behrens, D. H. D. L. Meadows and Randers, 1972), defines ecosystem as basically determined by the natural environment as opposed to man activities, showing the level of interaction between them. Eco-efficiency advocates that organizations can manufacture valuable product while gradually decreasing harmful environmental impacts, material intakes and cost. This theory further charge organization to focus basically on cause rather than consequences of their activities on the environment they operate. According to Porter and Linde (1995), eco-efficiency concept convey three significant messages to include enhancement of ecological and economic advancement, enhancement of environmental performance should not be seen as charity but a matter of competitive necessity and supportive role for sustainable development. Mackinglay (1997) posit that organization incurred social cost as basic responsibility to

improve social value as related cost cannot be matched with revenue.

The paradigm of eco-efficiency confirm the possibility of achieving better environmental performance without reducing economic result which in this study refers to financial performance of the cement companies. Albelo et al (2014) in their studies, posits that eco-efficiency permit the process that aimed at minimizing the environmental impact of business activity on the surrounding conditions and, at the same time to increase the effectiveness and the efficiency of production process by respecting the environment and creating business values. This is in line with the opinion of Schemmidheiny (1992) which opined that for businesses to achieve the aforementioned objectives, eco-efficiency is required to established business which enables effective management of a product`s life cycle attempting to use input production and reducing waste materials and contamination. Porter et al (1995) believed that people have wrong thoughts about the connection between competitiveness and the environment by thinking that caring for the environment involve higher cost whereas this would actually results in higher benefits that would enable businesses to introduce practices that cost of product or increase its value.

Miller (1996:89), defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. He maintained that complete sustainability may not achieve advancement towards its accomplishment has several merits. Eco-efficiency, a factor of improving environmental enhancement also secured numerous benefits such as increase demand for better products without humiliating the environment. Employees needs satisfaction, insurance rate reduction, lower cost of capital, securing healthy environment and improved technological system.

2.3 Empirical review

Enekwe, Ugwudioha & Uyagu (2023), examine the effect of environmental costs on the financial performance of listed oil and gas companies in Nigeria. The ex-post facto research design was employed for the collection of financial statements of four listed oil and gas companies in Nigeria for a ten-year period from 2010 to 2019. The purposive sampling technique was used for the study. The Panel Ordinary Least Square of the multiple regression model was conducted using the E-views version 9.0 statistical software package. The findings

revealed that staff development costs have a negative but insignificant effect on listed Nigerian oil and gas companies' return on assets, while community development costs and employee health and safety costs have a positive but insignificant effect. This implies that the amounts of these costs incurred by the studied companies are too small to have an impact on their performance metrics. However, studies are based on the quantity of information provided by a small number of companies, and as a result, these studies may be influenced by the costs that these companies incur as well as the extent to which they report those costs. The study is limited to only the oil and gas sector and some specific environmental cost variables. The utilization of environmental cost variables and the use of financial performance.

Uzoh, E. E (2022) evaluated the effect of environmental cost on financial performance of selected oil and gas firms in Nigeria. Specifically, the study examined the effect of environmental pollution prevention cost, environmental protection cost, environmental remediation cost and environmental recycling cost. Data for the study were generated from the content analysis of firms annual reports for the ten-year period (2009-2018). The data collected were subjected to inferential statistical analysis using SPSS version 20. The findings were that pollution prevention cost, environmental protection cost, environmental remediation cost and environmental recycling cost have positive effect on firm's financial performance.

Nwanwu (2022) evaluated the environmental management expenses and financial performance of Nigerian oil and gas firms for the period of nine (9) years from 2011 to 2018, both years inclusive. The explanatory research design of secondary data was used for the study. The linear regression model and e-views statistical software were also adopted for the study. The environmental management cost is an independent variable proxied by pollution cost (PC), while financial performance is a dependent variable proxied by net profit (NEP). The regression result indicated that pollution costs have a positive and significant impact on the net profit of Nigerian oil and gas firms.

Ekpose & Enidiok (2021) researched the influence of environmental costs on the financial performance of quoted Nigerian oil and gas firms for the period of eleven (11) years from 2009 to 2019, both years inclusive. The ex post facto research design, panel data, purposive sampling technique, and linear regression model were adopted

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

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

Nwaimo (2020) looked into how quoted enterprises' performance was impacted by

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

Chiamogu & Okoye (2020) adopted the ex-post facto research design for the impact of environmental costs on the financial performance of Nigerian oil and gas companies for an eleven (11) year period from 2008 to 2018, both years inclusive. The study used the purposive sampling technique for the selection of sample size. The environmental cost is an independent variable measured by community development cost (CDC) and environmental remediation cost (ERC), with two control variables as firm size (FSZ) and leverage (LEV), while financial performance is a dependent variable measured by Tobin’s Q (TQ). The regression analysis results revealed that community development costs (CDC) and environmental remediation costs (ERC) have a positive and significant effect on Tobin’s Q of listed oil and gas companies in Nigeria.

Okezie, Ibe & Kanu (2019) did an assessment on environmental costs and financial performance of quoted companies in Nigeria. The study set out to determine impact of environmental costs on Earnings Per Share, Dividend Per Share, Net Profit Margin, Return on Capital Employed on environmental costs of the quoted companies studied. The study employed ex post facto research design, anchored on Stakeholder's Theory and adopted a purposeful sampling method for the study. The study covers four (4) years period of annual report of the company under study covering period from 2014 to 2017. Descriptive and inferential statistics plus multiple Regression model were used to analyze the data collected from the annual report of the companies. The results and the findings show that there is highly negligible impact between environmental costs and financial performance in the companies studied. The study therefore recommends that the companies search for other factors which accounted for high cost and think of how to tackle them towards profitability. New technological approaches on cost reduction should be applied in the normal discharge of management functions geared towards improving financial performance.

Nwaiwu and Oluka (2018) studied the financial performance of Nigerian oil and gas corporations and environmental cost transparency. For this study, secondary data were employed, and a causal comparative research design was used in the methodology. This study also made use of time series data. Waste management costs (WMC), pollution abatement costs (PAC), and rules and regulations (LR) are used as independent variables in the environmental cost disclosure, while earnings per share (EPS) is used as a proxy for financial performance. This study also made use of time series data. Waste management costs (WMC), pollution abatement costs (PAC), and rules and regulations (LR) are used as independent variables in the environmental cost disclosure, while earnings per share (EPS) is used as a proxy for financial performance. The Pearson product was used to examine the data that was gathered. Moment correlation coefficient and multiple regression analysis were performed using SPSS version 24 for the social sciences. The findings show that environmental cost disclosure policies have a positive and noteworthy impact on the financial performance of Nigerian oil and gas businesses. Agbo et al. (2017) looked into how Nigerian Brewery's financial performance was impacted by environmental costs. For this investigation, secondary data were

employed. The information was taken from the Nigerian Brewery's annual report for the five (5) years between 2011 and 2015. Financial success as a dependent variable was proxied by return on assets, while environmental cost as an independent variable was proxied by donations, medical costs, training costs, recruitment costs, and canteen costs (ROA). The analysis for this study used multiple regression. The analysis was carried out utilizing the SPSS version 22 software suite. The findings indicate that medical expenses (ME) and donations (DN) have a negative, minor impact on the Nigerian Brewery's return on assets (ROE), whereas training, recruitment, and canteen expenses (TRC) have a positive, insignificant impact on ROA

Okafor (2018) studied using a study of publicly traded Nigerian oil companies, environmental expense accounting and reporting on business financial performance Ex-post facto research design and secondary data were employed in the study. Accounting for and reporting on environmental costs is an independent variable, whereas business financial performance is a dependent variable. The dependent variable was proxied by return on assets, whereas the independent variables were the cost of environmental remediation and pollution control, the cost of environmental law compliance and penalties, and the cost of donations and charity contributions. An analysis of financial records from oil and gas businesses listed on the Nigerian Stock Exchange from 2006 to 2015 was conducted. The statistical program for social sciences (SPSS) was used to conduct the analysis, which included the use of regression analysis. The statistical analysis's findings indicated that environmental remediation and pollution control have a positive but negligible impact on the return on assets of Nigeria's listed oil and gas companies, whereas compliance with environmental laws, penalties, donations, and charitable contributions have a significant positive effect.

Norhasmimah et al. (2016) examined the effect of environmental disclosure on Malaysian financial performance. Ex-post facto research design and secondary data were employed in the study. Financial performance is the dependent variable, with environmental disclosure acting as the independent variable. Total environmental disclosure (TED) served as a proxy for the independent variable, whereas return on assets (ROA), return on equity (ROE), earnings per share (EPS), and profit margin served as proxies for the dependent variable. Non-probability sampling approaches, such as convenience and

purposeful sampling, were used in this investigation. Ten (10) companies' annual reports were chosen at random as the sample size for this investigation. 2011 was the research study year, and annual reports were gathered. For this study, the researchers conducted multiple regression analysis as well as correlation (Spearman's rho). The analyses for this study were carried out using the SPSS program. The result indicated that total environmental disclosure (TED) has a significant negative impact on return on equity (ROE), a major positive impact on earnings per share (EPS), and a significant negative impact on profit margin (PM) of Malaysian listed companies.

Raymond et al. (2016) investigated how Nigerian corporate organizations' financial performance is affected by sustainability and environmental cost accounting. Financial success is a dependent variable, while sustainability and environmental cost accounting are independent variables. Environmental cost served as the independent variable's benchmark, while income and profit served as the dependent variable's benchmark. Time series data and the ex post facto study design were used. The financial reports for the years 2009 to 2013 were used by the researchers. For this investigation, the simple sampling method was employed. The analysis for the study was carried out using the statistical package for social sciences (SPSS) version 20 software. The study also made use of linear regression. The result revealed that environmental costs have a favorable considerable impact on revenue and a favorable small impact on profit for Nigerian corporate organizations. In the research of Musa et al. (2015) on the environmental accounting disclosure practices of Nigerian quoted firms using a case study of some selected quoted consumer goods companies, the study used secondary data and an ex-post facto research design. The study selected only eight (8) quoted companies out of nineteen (19) consumer goods companies listed on the Nigerian Stock Exchange. The annual reports for the eight (8) companies were collected and analyzed using one-way analysis of variance to test the hypothesis. The result indicates that accounting standards do not significantly influence the environmental accounting disclosures of selected consumer goods companies.

Ofoegbu and Megbuluba (2016) looked at the disclosure of corporate environmental accounting information by industrial companies in Nigeria. They looked at how firm factors influenced how well Nigerian manufacturing enterprises disclosed corporate environmental accounting information. The size and financial

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

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

Beredugo & Mefor (2012) evaluated the impact of environmental accounting and reporting on sustainable development in Nigeria. Pearson Correlation Coefficient and Ordinary Least Square Regression Analysis were used for data analysis and the findings indicated that there is a significant relationship between environmental accounting and reporting and sustainable development; that with environmental accounting encourage organizations to track their GH Gemissions and other environmental data against reduction target sand there are consequences for non-compliance with environmental accounting

and reporting. It was recommended that acceptable standard such as ISAR be acknowledged and Graphical indicators be adopted illustrating to users on timely basis whether the organization is performing above, below or in–line with the targets so that corrective actions can be taken as needed to successfully execute on sustainable initiatives.

Makori & Jagongo (2013) examined the environmental accounting and firm's profitability of selected firms in India to see if there is any significant relationship between them. Data for the study was collected from the annual reports of 14 randomly selected quoted companies in Bombay Stock Exchange in India which was analyzed using Multiple Regression Analysis through the use of Econometric Model. The key finding of the study shows that there is a significant positive relationship between environmental accounting and firm's profitability. It was recommended that government should give tax credit to organizations that comply with its environmental laws and that environmental reporting should be made compulsory in India so as to improve the performance of organizations and the nation as a whole.

Mgbame & Ilaboya (2013) examined the environmental accounting audit decisions and firm performance on the audited final accounts of 160 companies for 2009 financial year using the binary logit regression techniques to analyzed their data. The findings revealed that profitability is a positive and significant determinant in evaluating the probability that a firm includes environmental information for external audits and that firm specific factors may provide incentives for corporate environmentalism in Nigeria.

3.0 Methodology

The researcher adapted the ex-post facto design in carrying out the study. The choice of the design was necessary because the variables were present prior to the study and the researcher cannot in any way manipulate or control them. The population of the study was made up of ten major cements manufacturing companies in Nigeria. They were made up of wholly and partly indigenously owned cements manufacturing companies spread across the country.

The researcher adopted the formulae of Guilford and Fruchter (1973) to determine the required sample size for the study. This is expressed as: $n=N/1+N\ (e^2$

Where:

n= required sample size

N= Total population

e= Margin of error @ 0.05

Therefore, n= 10/1+10(0.05) ²

n= 10/1+10(0.0025)

n= 10/1 + 0.025

n=10/ 1.025

n= 9.76

Therefore, sample size is = 9

The nine (9) companies were then sampled using the judgemental technique.

3.1 Model specification

The independent variable is proxied with environmental cost EC while the dependent variables were proxied with profit after tax PAT, liquidity LIQ and net worth NWT

PAT =*f*(EC) ……(1)

The ordinary least square for the above model is started thus:

PAT = bo +b1EC+µ

bo = Constant term

b1 =Parameters to be estimated

e = Stochastic error term

b0, b1, ≥ 0

LIQ =*f*(EC) ……(2)

The ordinary least square for the above model is started thus:

LIQ = bo +b1EC+µ

bo = Constant term

b1 =Parameters to be estimated

e = Stochastic error term

b0, b1, ≥ 0

NWT =*f*(EC) …… (3)

The ordinary least square for the above model is started thus:

NWT = bo +b1EC+µ

bo = Constant term

b1 =Parameters to be estimated

e = Stochastic error term

b0, b1, ≥ 0.

3.2 Methods of data presentation and analysis

The methods adopted in analyzing the data collected for the study are both descriptive statistic and analytical approach involving regression analysis of time series data covering 2007 to 2014.

3.3 Decision rule:

Durbin – Watson (D-W) Statistics: This was used to test the econometric criterion at investigating whether the assumption of economic model employed is satisfactory or not any particular case. It was used to measure the degree of auto-correction among the variables used.

R-Square: R^2 is defined as the proportion of the total variation in the dependent variable

Y that is explained by the regression line (or independent variables). Hence the closer the R^2 is to one (1), the stronger is the explanatory power of the estimated regression line and thus, the closer the observations to the line.

F-Statistics: This was used to either accept or reject the null hypothesis (Ho) at 5% level of significance and n-2 degree of freedom. If the absolute value of the computed t-value is greater than the absolute value of the theoretical t-value, we reject H_O, if not we accept H_O.

4.0 Data analysis discussion of results

Table 4.1: Regression result of the effect of Environmental cost on financial performance of selected cements companies in Nigeria.

Variables	Estimated Coefficients	Standard Error	T-Statistic	P-Value
EC	1159307.6	866115.3	1.34	0.25
PAT	0.026	0.007	3.45	0.026
LIQ	0.037	0.01	3.65	0.022
NTW	0.005	0.002	1.92	0.127

R	=	0.93
R2	=	0.87
Adjusted R2	=	0.78
SEE	=	1405606
F-Statistic	=	9.4
DW	=	1.6

Source: Researcher`s computation

4.1 Analysis

The results of the analysis show that the dependent variables that is financial performance are positively influenced by environmental costs and financial performance of cement companies in Nigeria.

The coefficient of determination R2 value of 0.87 indicates that 87 percent change in the dependent variables is caused by the changes in the dependent variables. This implies that the other 13 percent changes could be caused by other factors indicated in the error term.

The value of the adjusted R2 of 0.78 indicates a goodness of fit of the parameter estimates. The total variation in the observed behavior of the variables that made up the financial performance of the selected cement companies is used as a measure of impact that Environmental costs beard on the financial performance of the companies. This shows that the line of the regression control more than 78 percent of the total variation in the dependent variables. That is, it accounted for 78 percent of the variation in profit after tax, liquidity and net worth of the companies under study. The remaining 22 percent is accounted for by the stochastic error term or other unknown variables not captured in the model.

The F-statistic was used in testing the statistical significance of the model is said to be statistically significant at 5 percent level because the F-statistic computed of 9.4 (p-value =0.028) is greater than the F-statistic table value of 6.59 at df1=3 and df4=7.

In testing the autocorrelation using Durbin Watson, the result shows that the D.W value of 1.6 falls within the inconclusive region of D.W partition curve. Therefore, it is concluded that the model is free from autocorrelation.

4.2 Test of hypotheses

The hypotheses earlier formulated in chapter 1 of the study were tested based on the regression results. All the hypotheses were tested at 0.05 level of significance.

4.2.1 Test of hypotheses 1

Ho1: Environmental cost has no significant effect on profitability of cement companies in Nigeria.

Decision rule:

The decision rule for testing of hypothesis 1 is:

If calculated t-statistics < Tabulated F-ratio, accept Ho1

If calculated t-statistics ≥ Tabulated F-ratio, reject Ho1

Decision:

Using the value of t-statistics in table 4.1 to test the significance of the estimated coefficients, the result shows that the calculated t-statistics of 3.45 is greater than the table value of 1.94. Since the calculated t-statistics is greater than the table value 3.45 > 1.94 with the degree of freedom n-2 (i.e 8-2) at 0.05 level of significance, the null hypothesis is rejected and alternate accepted. Therefore, it is concluded that environmental cost has significant effect on profitability of cement companies in Nigeria.

Test of hypothesis 2:

Ho2: Environmental cost has no significant effect on liquidity of cement companies in Nigeria.

Decision rule:

The decision rule for testing of hypothesis 1 is:

If calculated t-statistics < Tabulated F-ratio, accept Ho1

If calculated t-statistics ≥ Tabulated F-ration, rejected Ho1

Decision:

Using the value of t-statistic in table 4.1 to test for the significance of the estimated coefficients, the result shows that the calculated t-statistic of 3.65 is greater than the table value of 1.94. Since the calculated t-statistic is greater than the table value 3.65 > 1.94 with degree of freedom n-2 (i.e 8-2 = 6) at 0.05 level of significance, the null hypothesis is rejected and alternate hypothesis accepted. Therefore, it is concluded environmental costs has significant effect on liquidity of cement companies in Nigeria.

Test of hypothesis 3:

Ho3: Environmental costs does not have significant effect on net worth of cement companies in Nigeria.

Decision rule:

The decision rule for testing of hypothesis 1 is:

If calculated t-statistic < Tabulated F-ratio, accepted Ho1

If calculated t-statistic ≥ Tabulated F-ratio, rejected Ho1

Decision:

Using the value of t-statistic in table 4.1 to test for the significance of the estimated coefficients, the result shows that the calculated t-statistic of 1.92 is lower than the table value of 1.94. Since the calculated t-statistic is than the value 1.92< 1.94 with the degree of freedom n-2 (i.e 8-2 = 6) at 5% value of significance, the null hypothesis is accepted and alternate

rejected. Therefore, it is concluded that environmental costs have significant effect

on net worth of cement companies in Nigeria.

5.0 Discussion of findings:

It was revealed from the result of the analysis on table 4.6 on page 39 that there exist a positive and significant effect of environmental costs on profitability of cement companies in Nigeria. The result of the test of hypothesis one in page 41 confirmed that the effect is significant since the t-value of 3.45 obtained from the analysis was greater than the benchmark (table value) of 1.94. this finding is in line with the finding arrived at by Arong et al (2014) who in their study found out that there exist a significant effect of environmental costs management on the profitability of sector in Nigeria.

The study also revealed that environmental cost does have a significant effect on liquidity of cement companies in Nigeria. The result revealed that with t-value of 3.65, the effect is significant, and goes to suggest that as environmental cost is managed effectively, the liquidity of the companies would be greatly improved because important assets would be saved. This finding agrees with the findings of Uwuigbe et al (2012) which revealed that firm`s financial performance and the size of audit firm have a significant positive relationship with the level of corporate social responsibility disclosure.

The findings further showed that there exist no significant relationship between environmental cost and the value of net worth of cement companies in Nigeria. This finding corroborates the findings of Uwuigbeel al (2012) which revealed that total asses and leverage have no significant relationship with corporate social responsibility disclosure. It should be made clear that the value of net worth which represents the volume of investment in the company may not affect or be affected by the level of environmental cost because investors may consider other factors other than in their investment decision.

5.1 Summary of findings

The study was undertaken with the objective of assessing the effect of environmental accounting costs on the financial performance of cement companies in Nigeria. The following are the major findings of the study:

1. The result revealed that environmental cost significantly influences profitability of cement companies in Nigeria.
2. It was also discovered that the liquidity of cement companies in Nigeria can be influenced by the

level of environmental cost incurred.

3. The findings further showed that there exists significant effect of environmental cost on the value of net worth of cement companies in Nigeria.

6.0 Conclusion and recommendations

From the results obtained, it can be seen that information on environmental accounting especially environmental costs can significantly help cement companies in Nigeria to improve their financial performance through maximization of profit and enhancement of company`s liquidity. If the cement companies are able to generate and utilize this accounting information especially on environmental costs profile, then the companies can better manage the costs in order to maximize financial performance. After a careful consideration of the findings of the study, the researcher made the following recommendations which in his opinion would aid all interested parties either in making managerial decisions or undertaking similar study in the future.; cement companies should gather, analyzed and apply environmental costs information in such a way that wastages and liabilities are effectively controlled so that profitability is enhanced. Cement companies should continue to invest in and harness more liquid assets and effectively controlled costs resulting from environmental liabilities. Cement companies should seriously be involved in effectively controlling their environmental costs in order to be more attractive to existing and potential investors.

REFERENCES

Agbo, B.O; Ohaegbu, O.K & Akubuilo, F (2017). The Effect of Environmental Cost of Financial Performance of Nigerian Brewery. European Journal of Business and Management, 9(17), 59 – 64.

Chiamogu, A & Okoye, J.N (2020). Environmental Cost and Financial Performance of Oil and Gas Companies in Nigeria. International Journal of Advanced Academic Research for Social and Management Sciences, 6(10), 1 – 24 .

Chowdhury, A. A. & Hamid, K (2013). Present Status of Corporate Environmental Accounting in Bangladesh: A study based on some selected Textile Companies.

Research Journal of Finance and Accounting, 4(17), 122- 129.

Daniel, M.M & Ambrose, J (2013). Environment Accounting and Firm Profitability: An Empirical Analysis of selected Firms in Bombay Stock Exchange, India. International Journal of Humanities and Social Science, 3(18), 248 -255.

Ekpoese, J.D & Enidiok, E.O (2021). Environmental cost and Financial Performance of Quoted Oil and Gas Companies in Nigeria: A Critical Examination. International Digital Organisation for Scientific Research Journal of Applied Sciences, 6(1), 70 – 78.

Enekwe, C.I; Agu, C.I & Eziedo, K.N (2014). The effect of Financial Leverage on Financial Performance: Evidence of Quoted Pharmaceutical Companies in Nigeria. IOSR Journal of Economic and Finance (IOSR-JEF), 5(3), 17 – 25.

Ifurueze, M.S.K; Lyndon, M.E & Bingilar, P.F (2013). The Impact of Environmental Cost on Corporate Performance: A Study of Oil Companies in Niger Delta State of Nigeria. Journal of Business and Management, 2(2), 1 – 10.

Koutsoyianis, A (2003). Theory of Econometrics (2nd ed.). Palmgrave Publishers.

Lawrence, U.E & Bernard, E.E (2023). Environmental Costs and Financial Performance of Selected Industrial Goods Firms in Nigeria: A Moderated Regression Analysis Approach. FUOYE Journal of Finance and Contemporary Issues, 4(1), 83 – 97.

Musa, S.J; Peter, T & Bukar, M (2015). Environmental Accounting Disclosure Practice of Nigerian Quoted Firms: A Case Study of Some Selected Quoted Consumer Goods Companies. Research Journal of Finance and Accounting, 6(22), 31 – 37.

Ndukwe, O.D. & John C.O (2015). Determinant of Environmental Disclosures in Nigeria: A Case Study of Oil and Gas Companies. International Journal of Finance and Accounting, 4(3), 145 – 152.

Norhasimah, M.N; Norhabibi, A.S.B; Nor, A.A; Shehu, M.Q.A.S.K & Inaliah, M.A (2016). The Effects of Environmental Disclosure on Financial Performance in Malaysia.

7th International Economics and Business Conference Procedia Economics and Finance, 35, 117 – 126.

Nwaimo, S.C (2020). Effect of Environmental Costs on Performances of Quoted Firms in Sub-Saharan Africa (2007 – 2016). European Journal of Accounting, Auditing and Finance Research, 8 (7), 97 – 120.

Nwaiwu, N.J & Oluka, N.O (2018). Environmental Cost Disclosure and Financial Performance of Oil and Gas Companies in Nigeria. International Journal of Advanced Academic Research Financial Management, 4(2), 1 – 23.

Nwanwu, P.O (2022). Environmental Management cost and Financial Performance of Oil and Gas Companies in Nigeria. International Journal of Innovative Finance and Economics Research, 10(2), 119 – 134.

Ofoegbu, G.N & Megbuluba, A (2016). Corporate Environmental Accounting Information Disclosure in the Nigeria Manufacturing Firms. International Journal of Management Science and Business Research, 5(12), 208 – 220.

Okafor, T.G (2018). Environmental Costs Accounting and Reporting on Firm Financial Performance: A Survey of Quoted Nigerian Oil Companies. International Journal of Finance and Accounting, 7(1), 1 – 6.

Okezie, B.N, Ibe, S.U & Kanu, C.I (2019). Environmental Costs and Financial Performance of Listed Firms in Nigeria. AE-FUNAI Journal of Accounting, Business and Finance (FJABAF), 5(1), 98 – 112.

Onipe, A.Y (2018). Environmental Reporting Practices and Financial Performance of Listed Environmentally-Sensitive Firms in Nigeria. A Journal of Environmental and Social Sciences, 24(2), 403 – 412.

Onyekwelu, U.L (2015). Firm Foundation in Accounting and Finance Research. His Glory Publications.

Oraka, A.O (2021). Environmental Costs and Financial Performance of Oil and Gas Companies in Nigeria.

Research Journal of Management Practice, 1(5), 1 – 18.

Raymond, A.E; John-Akamelu, R & Chigbo, C.B.E (2016). Effect of Sustainability Environmental Cost Accounting on Financial Performance of Nigerian Corporate Organisations. International Journal of Scientific Research and Management (IJSRM), 4(8), 4536 – 4549.

Sergio, M & Carmen-Pilar, M (2017). Analysing the Effect of Corporate Environmental Performance on Corporate Financial Performance in Developed and Developing Countries. MDPI Journal of Sustainability, 9, 1 – 30.

Shehu, U.H (2011). Environmental Cost and Firm Performance: Evidence from Quoted Oil Companies in Nigeria. International Journal of Marketing and Technology, 1(6), 6 – 21.

Uwuigbe, U & Olayinka, M.U. (2011). Corporate Social and Environmental Disclosure in Nigeria: A Comparative Study of the Building Material and Brewery Industry. International Journal of Business and Management, 6(2), 258-264.

Waris, A., & Muhammed, R. (2013). Factors Influencing Corporate Social and Environmental Disclosure Practices in the Developing Countries: An Institutional Theoretical Perspective. International Journal of Asian Social Science, 3(3), 590-609.

Enekwe, C. I, Ugwudioha, O. M & Ugyagu, B. D (2023) effect of environmental cost on the financial performance of listed oil and gas companies in Nigeria. International journal of Accounting Research, 8(1), 31-36

Uzoh, E. E (2022) Effect of environmental cost on financial performance of selected oil and gas firms in Nigeria. Advance journal of Management, Accounting and Finance. 7(8), 1-12

Okezie, B. N, Ibe, S. U & Kanu, C. I (2019) Environmental costs and financial performance of listed firms in Nigeria. AE-FUNAI journal of Accounting, Business and Finance (FJABAF). 5(1), 98-112