



THE IMPACT OF ENVIRONMENTAL ACCOUNTING ON FINANCIAL PERFORMANCE OF QUOTED COMPANIES IN NIGERIAN EXTRACTIVE INDUSTRY

BUKAR MUSA

Department of Accountancy, Federal Polytechnic Mubi

ABSTRACT

Environmental accounting is now widely accepted as a medium through which companies assess the impact of their activities on the environment and provide environmental performance related information to diverse stakeholders. But the main issue of concern is that environmental accounting is perceived as a voluntary disclosure in countries like Nigeria and as such those engaged in it, only disclose qualitative and positive statement about environmental performance. Previous studies examined disclosed that few companies in

Introduction

The state of the world's environment and the impact of mankind on the ecology of the world have led to environmental pollution; environmental degradation and destruction; modification of the ecosystem through species elimination, change in the biodiversity of the environment; deforestation, drought and desertification. This creates public concern and scrutiny of the operations and performances of organization (Uwuigbe, 2012). Similarly, organizations are now expected to address the impact of their operations on the environment and society in general. This has become so acute that stakeholder's awareness on issue become so serious that environmental accounting is now viewed as an alternative to conventional mode of reporting and disclosure used by companies in their published annual reports (Innocent, Okafor & Egolum, 2014). What constitute environmental costs as revealed in the study of Graff, Ferskin, White and Bodroell (1998) is any cost, direct or less intangible, with short or long-term financial consequences for the firm. Those include costs for handling treatment of and disposal of waste and emissions, remediation and compensation costs related to environmental damage and any control related regulatory compliance costs; such as equipment depreciation, operating materials, water and energy, internal personnel, external services, fees, taxes and permits, fines, insurance and remediation costs. Enahoro (2011) stated that effective environmental costs identification; classification and reporting will give added objectivity to financial statements for decision making. Also, budgeting and effective budgetary control of environmental costs will allow for



extractive industry (consisting of oil and gas, mining, quarrying,) provide quantitative and in monetary term their environmental performance. This study investigated how these reported environmental cost impact on their financial performance. Taking the environmental cost reported as the independent variable and Return on Capital Employed (ROCE), and Return on Assets (ROA) as the dependent variables to formulate hypothesis, which were tested on data obtained from five (5) years published annual reports (2016-2021) of 12 quoted companies in Nigerian Extractive industry. Secondary data obtained was analyzed using descriptive statistics, ordinary least square regression, Durbin Watson statistics and correlation coefficient to assess the impact. It was found that environmental accounting has a negative impact on the financial performance proxies ROCE and ROA. As a results of environmental cost is statistically insignificant as it ranges from 1% - 30.6%. The study, therefore, recommends that the regulatory bodies should come up with a comprehensive and all-inclusive standard to guide on environmental accounting and its subsequent effect on financial performance of firms

KEYWORDS: Environment Accounting; Return on Assets; Return on capital employed; Performance; Extractive industry

effective and efficient management of environmental cost. These environmental costs are subject to varied specifications and definitions. In the work of Shield, Beloff and Heller (1996), the term was often used to refer to costs incurred in order to comply with regulatory standards. Also costs which have been incurred in order to reduce or eliminate releases of hazardous substances and all other costs associated with corporate practices aimed at reducing environmental impacts.

There are several reasons for studying environmental accounting in the extractive sector of the economy. The extractive sector is a very large producer of pollution due to its size and predominance in pollution intensive industries such as oil, gas, mining of minerals and metals. The depletion of non-renewable resources as a results of air emissions, discharge of liquid effluent and the activities generation of large volumes of solid waste. Energy use and contribution to global warming are also considered to be significant in the industry. Mining of some types of minerals (for example metal and cement) is also associated with acid drainage problems that can cause long term acidification of waterways and negatively impact biodiversity. Some effluents generated by the extractive industry can also contain quantities of toxic substances such as cyanide and heavy metals, methane which can pose significant human health, animal health and ecological risks (Azapagic, 2004).

The extractive industry has been defined as the industry that focused on extracting natural resources from the ground such as sand, clay, salt, stone, petroleum (oil and gas) and mining industries (Luther, 1996). Such industries have received wide attention in the world of business because the extractive industry is considered to be one of the most effective and important sectors in the world of business and is universally considered as environmental sensitive (Deegan & Gordon, 1996; Frost, 1999; Frost, 2007; Hackson & milne, 1996; Patten, 1992). The World Bank



(2005) defined the extractive industries to include oil, gas and mining of minerals and metals. These industries have a visual impact on the landscape and lead to the destruction or disturbance of natural habitats, change in the biodiversity of ecosystem, deforestation, desertification and drought resulting in a loss of human lives and damage to the extended ecosystem.

An unresolved research issue in environmental accounting is not the extent to which it impacts on corporate financial performance of the firm (Al Tuwaijri, Christensen & Hughes, 2004; Hughes, Anderson & Golden, 2011), but rather on how it is measured particularly environmental related cost. Therefore, there is need for proper charging and allocation. Distinguishing between environmental costs and other costs will lead to a proper cost allocation of these costs and thus more precise and will help to develop sustainability indicators. Studies also reveal that the cost of environmental degradation is usually lumped into overheads which are used in price determination of goods and services and later borne by the consumers instead of the organization treating it as its own cost (Degburo et.al, 2008).

Nikolaev (2003) observes that environmental cost provides a framework to environmental responsibility and corporate performance and that the extent to which the environmental costs influence performance is not discovered. Environmental issues arise across the whole life cycle of the extractive industry products including the use and disposal stages. For instance, the use of some minerals can have toxic effects on humans and the environments. The most drastic examples here are asbestos, lead and uranium. Other issues include generation of solid waste and loss of valuable resources at the end of the products life cycle (Azapagic, 2004).

Objectives of the Study

The main objective of this study is to assess the impact of environmental accounting on financial performance of quoted companies in Nigerian extractive industry. The specific objectives include:

- i. To assess the impact of environmental cost on return on equity (ROE) of quoted companies in Nigerian extractive industry.
- ii. To examine the impact of environmental cost on return on assets (ROA) of quoted companies in Nigerian extractive industry.

Research Questions and Research Hypothesis

The following research questions were developed from the objectives of the study;

- i. To what extent does environmental cost impact on return on equity(ROE) of quoted companies in Nigerian extractive industry?
- ii. What impact does environmental cost have on return on assets (ROA) of quoted companies in Nigerian extractive industry?

The following null hypotheses are formulated to serve as a guide to the study.

Ho₁: Environmental cost has no significant impact on return on capital employed of quoted companies in Nigerian extractive industry.

Ho₂: There is no significant impact of environmental cost on return on assets of quoted companies in Nigerian extractive industry.

CONCEPT OF ENVIRONMENTAL COST: The U.S. Environmental Protection Agency (1996) defines environmental costs as those costs that have a direct financial impact on a company (internal



costs), and costs to individuals, society and the environment (external costs). Internal costs may include conventional costs, potentially hidden costs, contingent costs and image or relationship costs (United State Environmental Protection Agency, 1995). Conventional costs include costs of capital equipment, raw materials and supplies. Hidden costs refer to the results of assigning environmental costs to overhead pools or overlooking future and contingent costs.

Contingent costs refer to environmental costs that are not certain to occur in the future but depend on uncertain future events, for example, the costs involved in remediating future spills. Image and relationship costs are less tangible costs because they are incurred to affect subjective perceptions of management, customers, employees, communities, and regulators. This category can include the costs of annual environmental reports and community relations activities and costs expended voluntarily for environmental activities such as tree planting. The costs themselves are not intangible, but the direct benefits that result from corporate image expenses often are (Beer and Friend, 2006).

External costs include: (1) environmental degradation for which firms are not legally liable and (2) adverse impacts on human beings, their property and their welfare that cannot always be compensated for through legal systems (Beer and Friend, 2006). External costs usually arise from specific attributes of natural resources. Some of these exhibit private good characteristics. Fossil, fuels, minerals, agricultural and some forested land would be examples of such resources. Private markets for the allocation of such resources tend to develop and function reasonably well. Environmental problems, by contrast, are often associated with resources which exhibit public good characteristics, where markets are either incomplete or nonexistent. For such resources (for example clean air and water, ocean fisheries and natural areas), incomplete markets create a danger of exhaustion from misuse (Milne, 1991).

What is important is that environmental costs are not ignored. Obviously, some consistency in how an organization defines environmental costs from period to period will enable more meaningful inter period comparisons. Uncovering and recognizing environmental costs associated with a product, process, system, or facility is important for good management decisions. Attaining such goals as reducing environmental expenses, increasing revenues, and improving environmental performance requires paying attention to current, future, and potential environmental costs (Wildavsky, 1994). How a company defines an environmental cost depends on how it intends to use the information (e.g., cost allocation, capital budgeting, process/product design, other management decisions) and the scale and scope of the exercise. Moreover, it may not always be clear whether a cost is "environmental" or not; some costs fall into a gray zone or may be classified as partly environmental and partly not. Whether or not a cost is "environmental" is not critical; the goal is to ensure that relevant costs receive appropriate attention (European Commission, 2000).

FINANCIAL PERFORMANCE: Magara et al., (2015) defined financial performance as measures to give the account of stewardship by the management team to the shareholders. The key aspect of this involves measuring the profitability, market value and growth prospect of a company. Financial performance is commonly used as an indicator of a firm's financial health over a given period of time. The financial performance of a firm can be defined or measured in different ways including profitability, gross return, market share growth, return on investment, return on equity and liquidity. Similarly, Bhattarai (2014) asserted that the economic performance of a firm is



considered as an important factor in determining whether environmental issues will be a priority or not and that in periods of low economic performance, the firm's economic objectives may be given more attention than environmental concerns.

Purnomo and Widianingh (2012) observed that financial performance measure can be done with the assessment of financial ratio analysis as a basis for assessing and analyzing the company's operating accomplishment or company performance. Financial performance (FP) is commonly used as an indicator of a firm's financial health over a given period (Vijfvinkel, Bouman, and Hessels, 2011). Firm FP can be defined as a firm's financial viability or the extent to which a firm achieves its economic goals (Price and Mueller, 1986; Venkatraman and Ramanujam, 1987). There are five measures of firm FP: liquidity (for example, quick ratio, current ratio); asset management (for example, inventory turnover ratio, average collection period, fixed assets turnover ratio, total assets turnover ratio); debt management effectiveness (for example, total debt to total assets ratio, times interest earned (TIE) ratio, fixed charge coverage ratio); profitability (for example, returns on investment, return on equity); and market value (for example, price/earnings ratio, market/book ratio). Financial performance has been an important focus in the research of companies' performance (Barney, 2002; Richard, Devinney, Yip, & Johnson, 2009). In the earlier years, researchers utilized accounting-based performance, such as Return on sales (ROS), Return on Assets (ROA), and Return on Equity (ROE) as proxies of financial performance.

A study from Gentry and Shen (2010) describes the relationship between accounting-based measurement and market-based measurement. They argue that positive correlation exists between the measurements of financial performance. The noteworthy result from their research is their argument for future research of financial performance to combine both accounting and market performances but should not measures in a single financial performance because of the covariance of the relationship is low (Gentry & Shen, 2010).

Environmental Accounting (cost) and Return on Assets (ROA): Return on Assets (ROA) or its variant Return on Total Asset (ROTA) is one of the most commonly used financial performances employed in determining impact or relationship between environmental accounting and financial performance. ROA explicitly, takes into account the assets used to support business activities, determines whether the company is able to generate adequate returns on these assets rather than simply showing robust returns on sales (Palmer, 2012).

The results obtained from the use of ROA and environmental accounting are mixed. Positive impact was reported by some researchers (Saleh, Zulkifli and Mohammed, 2011; Suleiman and Moktar, 2009; Waddock and Graves, 1997; Nelling, 2006; Hart and Ahuja, 1996; Russo and Fourts, 1997; Nakao, et. al., 2007; Vasanth, et. al., 2015 and Guenster, et. al., 2011; Vinayagamooth, Murugesan and Kasilingam, 2015; and Omnamasivaya and Prasad, 2017). Neutral or no significant relation was found in the study of Salema, (2005); Aupperle, et.al, (1985); Mcwilliam and Siegel, (2000); Nor, Bahari, Adnan, Kamal and Ali, (2016) Gonzalez and Gonzalez, (2005); Rahman, Jauhari and Roslan, (2015); and Malarvizhi and Matta, (2016).

Environmental Accounting (cost) and Return on Capital Employed (ROCE): Return on capital employed (ROCE) or return on investment (ROI) as it is called is means of measuring the success of a business in realizing its goals, indicating the overall efficiency and profitability of firm (Chen, Tang and Feldmann, 2014). It measures how well the firm is utilizing its capital employed to



generate revenue. ROCE is useful measure to evaluate longevity of a firm as it shows how effectively assets are performing considering long term financing (Malarvizhi and Matta, 2016).

Studies in this area also give a mixed result. Positive relationship or effect was found in the work of Wagner, et.al. (2002); Odetayo, Adeyemi and Sajuyigbe, (2012); Oba, Fodio and Soje, (2012); and Agbiogwu et.al (2016). While Makori and Jagongo, (2013); Vasanth el. al. (2015); Adediran and Alade, (2013); and Vinayagamooth, Murugesam and Kasilingam, (2015) all disclosed a negative or inverse association between environmental accounting and ROCE. The work of Malarvizhi and Matta, (2016) shows no significant relationship.

Empirical Review: Most studies on environmental accounting had used various indices to measure environmental performance and how it affects corporate financial performance. Reduction in toxic waste emission, waste recycled and waste management (Hart and Ahuja, 1996; Al-Tuwaijri, Christensen and Hughes, 2004; Hamilton, 1995; Alvarez, 2012; Elfrink and Ellison, 2009 and Kumazawa and Callaghan, 2012; Ochiri, Wario, Odhiambo and Arasa, 2015 and Osuga and Okello, 2015); Environmental expenditure, environmental cost and environmental liabilities (Bassey, Effiok and Eton, 2013; Spicer, 1978 and Nehrt, 1996); Environmental disclosure, environmental performance index and environmental performance score (Oba, Fodio and Soje, 2012; Nor, Bahari, Adnan, Kamal and Ali, 2011; Rahman, Yusoff and Mohammed, 2009; Nakao, Nakano, Amano, Matsumura, Gemba, 2007; Vasanth, Selvam, Lingaraja and Ramkumar, 2016; Gatimbu and Wabwire, 2016; Norhasimah, 2015; Ong, Tho, Goh, Thai and Teh, 2016); Environmental responsibility and rating (Aggarwal, 2013); Decrease in toxic chemical emission and chemical oxygen demand (Konar and Cohen, 2001; King and Lenox, 2002; Wagner, Van phu, Azoma hou and Wehrimeyer, 2002; and Shalbaz, Tiwari and Nasir, 2013); Energy consumption, material consumption, water consumption and efficiency (Zeren and Koc, 2014; Dogan, 2014; Ong, Teh and Ang, 2014; Leitai, 2015 and Sinha, 2015); Pollution prevention and reduction (Sarkis and Cordeiro, 2001 and Spicer, 1978); Environmental proactivism measurement and environmental ratings (Cordeiro and Sarkis, 1997; Waddock and Graves, 1997; and Russo and Fonts, 1997) Clean water regulation (Rassier and Earnhart, 2010) and Greenhouse gas emission and waste reduction (Iwata and Okada, 2011; Butch and Hoffman, 2011 and Rokhmawati, 2015; Griffin and Sun, 2012) Spills and other plant accidents (Karpoff, Lott and Rankine, 1998) Lawsuits concerning improper disposal of hazardous waste (Muoghalu, 1990); Ranking of superior environmental performers reward or other recognition for superior environmental performance and participation in environmental management standards (White, 1996; Lorraine, Collison and Power, 2004) were all used to hypothesized relationship between environmental accounting and corporate financial performance.

Theoretical Framework: In order to conduct the study on the impact of environmental cost on financial performance of companies in the Nigerian extractive industry, the stakeholder theory was found relevant. (Buhr, 2007; Setyorini and Ishak, 2012).

Stakeholder Theory: The stakeholder's theory was propounded by Freeman, R. Edward in 1984 in his work "strategic management: a stakeholder approach". In this work he identifies and models the groups which are known as the stakeholders of a corporation. He describes and recommends methods by which management can give due regard to the interest of these groups (Wikipedia, 2017). The stakeholder's theory implies that the business interacts with a number of actors in the environment. These actors are groups called stakeholders and can be investors, political groups,



customers, communities, employer's trade association, suppliers, and government etc., the communication of influence is bidirectional i.e. the business to its stakeholders and the stakeholders to the business (Donaldson and Preston, 1995). It is used as one of the framework in corporate social responsibility methods. For example ISO 26000 and GRI (Global Reporting Initiative) involve stakeholder analysis (Mansell, 2013).

Moneva and LLena (2000) said that stakeholders theory gives the premise for which social and environmental accounting information are disclosed voluntarily by companies in response to the existence of users who are legitimately interested in the behavior of the company and who compete with traditional users (Freeman, 1984; Woodward, Birkin and Edward, 1993; Roberts, 1992; Donaldson and Preston, 1995; Fekrat, Inclan and Petroni, 1996). Tilt (1994), states that the recognition of stakeholders who demand social information, together with the impact of activities that are harmful to the environment, have created a favorable context of the disclosure of data which reflect the interaction between the company and the environment. The progressive increase in the number of obligatory rules has also contributed towards the creation of this situation. The premises of stakeholder theory, is that management supplies information designed to satisfy the stakeholders fundamentally the most relevant (Roberts, 1992). This information may, in some case be of a nature which generates negative reactions in the market (Meznar, Nigh and Kwok, 1994).

METHODOLOGY: The research design employed in this study is the ex-post factor design. The choice of ex post facto research design is because the study was based on past event and the variables are studied the way they are. Data was extracted from the published annual reports and accounts and Nigerian Stock Exchange factbook.

The population of this study is sixteen (16) quoted companies in the Nigerian Extractive Industry listed on the Nigerian Stock Exchange (NSE) as at 31st December, 2021 that have consistently submitted their annual reports to the NSE from 2016 to 2021. The sample size of this study consists of twelve (12) companies drawn from the population based on availability of annual reports and accounts in public circulation. List of Sample Companies Drawn from the Population

S/N	Name of company	Sector
01	Ashaka Cement Plc	Industrial goods (cement)
02	Capital oil Plc	Oil and Gas
03	Cement Company of Northern Nigeria	Industrial goods (Cement)
04	Conoil Plc	Oil and Gas
05	Dangote Cement Plc	Industrial goods (Cement)
06	Eternal Plc	Oil and Gas
07	Forte oil	Oil and Gas
08	Lafarge Africa Plc	Industrial goods (Cement)
09	MRS Oil	Oil and Gas
10	Multiverse mining and exploration	Natural resources
11	Seplat petroleum Dev. Com	Oil and Gas
12	Total Nig. Plc	Oil and Gas

Source: Researcher sampling, 2022

The techniques used to analyze the data for this study is descriptive statistics while the hypothesis was tested using ordinary least square (OLS) regression.



Descriptive statistics: this was used to present the data in brief by providing the mean, the standard error and standard deviation, the minimum and maximum values

Model Specification: To determine the impact of environmental accounting on financial performance of quoted companies in Nigerian extractive industry. The following model was developed for each hypothesis stated earlier and which examines the relationship between the dependent variables and the independent variables.

The independent variable is the environmental accounting cost (ENVC). This is the environmental cost of quoted companies in the extractive industry, which in this study is the restoration cost, remediation cost, rehabilitation cost and decommissioning cost of those companies. It relates to expected reclaiming of excavated quarry sites (mines), oil fields and other mining location into a habitable settlement for farming and local villager’s settlement.

While the dependent variables are:

$$\text{ROCE is calculated as} = \frac{\text{Profit before tax}}{\text{Capital employed}} \times \frac{100}{1}$$

$$\text{ROA is calculated as} = \frac{\text{Profit after tax before extra-ordinary items}}{\text{total assets}} \times \frac{100}{1}$$

$$\text{ROCE} = \beta_1 + \beta_2 \text{ ENVC} + \mu t_1 \dots \dots \dots (1)$$

$$\text{ROA} = \beta_1 + \beta_2 \text{ ENVC} + \mu t_2 \dots \dots \dots (2)$$

Where ROCE is return on capital employed

- “ ROA is return on assets
- „ β_1 is the co-efficient of ROCE, and ROA, „
- β_2 ENVC is the co-efficient of environmental accounting
- „ $\mu t_{1,2,3 \& 4}$ is the error terms used respectively.

The apriori expectation on the impact of environmental accounting on financial performance proxies is that ROCE, and ROA should have a positive relationship as indicated by the stakeholders and legitimacy theories. This is so, because all the financial performance proxies used are dependent on earnings generated by those companies and environmental cost being an expense tends to reduce earnings or have effect on earnings.

DATA PRESENTATION AND ANALYSIS

Descriptive Statistics: With the aid of SPSS version 21 statistical tool, the researcher used the data to compute the descriptive statistics as shown below:

Table 1: Descriptive Statistics Analysis

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis			
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Std. Error	
ENVC	60	9.60	9700.98	1431.88	231.2	1790.86	2.116	.309	6.774	.608
ROCE	60	-328.40	189.60	10.42	7.47	57.85	-3.294	.309	21.491	.608
ROA	60	-46.28	672.00	26.90	13.45	104.21	5.426	.309	30.163	.608
Valid N (listwise)	60									

Source: Researchers’ computation using SPSS 21, 2022



The Table, above shows that descriptive statistics of ENVC (the independent variable). As well as ROA, and ROCE, (Dependent variables) the result shows that the mean of ENVC is ₦1431.88m that is widely varied with standard deviation of ₦1790.86m. This shows that there was no stability of ENVC spent across the firms under consideration. The mean on return on capital employed is 10.45% with high variability of 57.85. This indicates lack of stability for ROCE earned within the firms under study. The variable ROA has a mean of 13.45% with high variability of 104.21. This indicates that the ROA earned within the firms under consideration is not evenly stable during the time of the study.

Test of hypothesis

Regression results of ENVC and ROCE

Restatement of the hypothesis: H₀₁: Environmental Accounting has no significant impact on return on capital employed of quoted companies in Nigerian extractive industry.

Table 2: Regression results of ENVC and ROCE

Model	R squared	Adjusted R Square	F	Sig.	Standardized Co-efficient	T	Sig.
1(constant)	0.309	0.297				4.495	0.000
ENVC					-0.556	-5.097	0.000
Regression			25.976	0.000 ^b			
a. Dependent variable; Sum Mean ROCE							
b. Predictors (constant) Sum Mean ENVC							

Source: SPSS output file (Version 21.0)

The regression results (SPSS output), in which ROCE is the dependent variable, are presented in table 3.2 which shows that the F score is 25.976 with a sig. value (P value) of 0.000 which establishes that the model is fit and could be used. Further the co-efficient of determination R² = 0.309 implies that 30.9 percent of the variations in the ROCE can be explained by the independent variable ENVC.

To examine the impact of the independent variable on ROCE, the t statistics are considered. Table 4.2 shows that at a 95% confidence level, the ENVC has a negative effect on ROCE. This means that an increase in ENVC will lead to decrease in ROCE. That an increase of 1% in ENVC will lead to decrease of 55.6% in ROCE.

Decision Rule: to reject the null hypothesis that environmental accounting has no significant impact on return on capital employed of quoted companies in the Nigerian extractive industry.

Regression results of ENVC and ROA

Restatement of the hypothesis: H₀₂: There is no significant impact of environmental accounting on Return on Assets (ROA)

Table 3: Regression results of ENVC and ROA

Model	R squared	Adjusted R Square	F	Sig.	Standardized Co-efficient	T	Sig.
1(constant)	0.009	-0.009				1.106	0.273
ENVC					0.093	0.708	0.482
Regression			0.501	0.482 ^b			
a. Dependent variable; Sum Mean ROA							
b. Predictors (constant) Sum Mean ENVC							



Source: SPSS output file (Version 21.0)

The result in table 4.3, in which ROA is the dependent variable shows that the f-score is 0.501 with a sig. value (P.Value) of 0.482 which indicates that the model is not fit and cannot be used to draw conclusion. Furthermore, the coefficient of determination $R^2 = 0.009$ implies that 0.9 percent of variations in ROA can be explained by the independent variable ENVC.

To examine the impact of the independent variable (ENVC) on dependent variable (ROA), the t statistics was employed. Table 4.3 shows that at a 95% confidence level, the ENVC has a negative effect on ROA. This implies that an increase in ENVC will lead to an increase in ROA. That an increase of 1% in ENVC will lead to an increase of 9.3% in ROA.

Decision rule: to reject the null hypothesis that there is a significant impact of environmental accounting on return on assets (ROA).

Findings of the Study: The following are the findings of the study.

- i. Environmental accounting has a negative impact on ROCE but ENVC is not statistically significant in influencing ROCE and that only about 30.9% of variation in ROCE is explained by ENVC.
- ii. Environmental accounting has a positive impact on ROA and that only 0.9% of variation in ROA is explained by ENVC. And it is not statistically significant.

CONCLUSION:

The issue of environmental accounting reporting and disclosure would continue to solicit debates from both the academics and professional accountants due to lack of comprehensive and all-inclusive regulation or standards on how companies should disclose their environmental accounting information but it is rather done voluntarily. This study show that environmental accounting has both positive and negative impact on financial performance variable and as such the issue still remain contentious as environmental accounting (environmental cost) should have reported a negative relationship since it is a cost item. The following suggestions are put forward based on the findings of this study.

- i. Companies should have scrutinized environmental accounting issues by adopting those environmental related issues that would add value to their stakeholders.
- ii. Collaborative efforts by all stakeholders in demanding that organizations report for the effects of their activities on the environment.
- iii. Companies may ignore environmental accountings as engaging in environmental related issues may increase cost of operations.
- iv. Harmonization and standardization of the environmental accounting reporting index to be an all-inclusive document for usage by the companies.

REFERENCES

- Adediran, S.A., & Alade, S.O. (2013). The Impact of Environmental Accounting on Corporate Performance in Nigeria. *European Journal of Business and Management*, 5(23), 141 – 151.
- Aggarwal, P. (2013). Relationship between Environmental Responsibility and Financial Performance of Firms: A Literature Review. *IOSR Journal of Business and Management (IOSR-JBM)*, 13 (1), 13 – 22.



- Al –Tuwaijri, S., Christensen, T., & Hughes, K. (2004). The relations among Environmental Disclosure, Environmental Performance, and Economic Performance: A Simultaneous Equations Approach. *Accounting, Organisation and Society*, 29 (5). 101 – 135.
- Alvarez, I. (2012). Impact of Co2 Emission Variation on Firm Performance. *Business Strategy and the Environment*, 21 (7), 435 – 454.
- Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. (1985). An Empirical Examination of the Relationship between Corporate Social Responsibility and Profitability. *Academy of Management Review*, 28, 446 – 463.
- Barney, J. (2002). *Gaining and Sustaining Competitive Advantage* (2nd Ed.). Upper saddle River, NJ, PrenticeHall
- Bassey, B.E., Effiok, S.O., & Eton, O.E. (2013). The Impact of Environmental Accounting and Reporting on Organisational Performance of Selected Oil and Gas Companies in Niger Delta Region of Nigeria. *Research Journal of Finance and Accounting*, 4 (3), 57 – 73.
- Beer, P., & Friend, F. (2006). Environmental Accounting; A Management tool for enhancing Corporate Environmental and Economic Performance. *Ecological Economics*, 58(3), 548 – 560.
- Beredugo, S.B., & Mefor, I.P. (2012). The Impact of Environmental Accounting and Reporting on Sustainable Development in Nigeria. *Research Journal of Finance and Accounting*. 3(7), 55 – 64.
- Bhattarai, B.P. (2014). The Relationship between Environmental Accounting and Firm Performance: An Empirical Analysis of Selected listed Companies in Nepal Stock Exchange, Nepal. *International Journal of Engineering and Management Technology*, 2(4) (<http://www.ijent.in>).
- Bromiley, P. (1990). On the Use of Financial Theory in Strategic Management. *Advances in Strategic Management*, 6, 71 – 78.
- Buhr, N. (2007). Histories of and Rationales for Sustainability Reporting in Unerman, J. Bebbington, J. & O'Dwyer, B. (Eds) *Sustainability Accounting and Accountability*, (55- 69). London: Routledge.
- Busch, T., & Hoffmann, V. H. (2011). How hot is your Bottom Line? Linking Carbon and Financial Performance. *Business and Society*, 50, 233- 265.
- Chen, L., Tang, O., & Feldmann, A. (2015). Applying GRI Reports for the Investigation of Environmental Management Practices and Company Performance in Sweden, China and India. *Journal of Cleaner Production*, 98, 36 – 46.
- Coleman, L. (2011). Losses from Failure of Stakeholder Sensitive Processes Financial Consequences for Large US Companies from Breakdowns in Product, Environment and Accounting Standards. *Journal of Business Ethics*, 98 (2), 247 – 258.
- Cordeiro, J. J., & Sarkis, J. (1997). Environmental Proactivism and Firm Performance: Evidence from Security Analyst Earnings Forecast. *Business Strategy and Environment*, 6, 104 – 114.
- Deegan, C., & Gordon, B. (1996). “A Study of Environmental Disclosure Practices of Australian Corporations” *Accounting and Business Research*, 26 (3), 187 – 199.
- Degburo, D., Adebowatan, M. & Iroegbu, T. (2008). Environmental Accounting: The Emerging Relevance of Environmental Audit for the Accounting Profession. *ICAN Student Journal*, 12 (4), 11 – 13.
- Dogan, E. (2014). Energy Consumption and Economic Growth: Evidences from Low-Income Countries in Sub-Sahara Africa. *International Journal of Energy Economics and Policy*, 4 (2), 154 – 162.
- Elfrink, J., & Ellison, M. (2009). Accounting for Emission Allowances: an Issue in Need of Standard. *CPA journal*, 79 (2), 30 – 33.
- Enahoro, J. A. (2011). Legitimacy for Accounting for Environmental Degradation and Pollution. *European Scientific Journal*, 8 (4), 180 – 201.
- European Commission (2000). *Communication from the Commission on Promoting Sustainable Development in the EU Non-energy Extractive Industry*. Brussels. The European Commission.
- Fekrat, M., Inclan, C., & Pefroni, D. (1996). Corporate Environmental Disclosure: Competitive Disclosure Hypothesis Using 1991 Annual Reports Data. *International Journal of Accounting*, 31 (2), 179 – 195.
- Fernandez-Sanchez, J.L., & Sotorrio, L.L. (2007). The Creation of Value through Corporate Reputation. *Journal of Business Ethics*, 76(3) 355 – 376.
- Frost, C. R. (1999). *Environmental Reporting: An Analysis of Company Annual Reports of the Australian Extractive Industries 1985-1994*. (Unpublished) Doctor of Philosophy Thesis, University of New England, Armidale, NSW.
- Gatimbu, K. K., & Wabwire, J. M. (2016). Effect of Corporate Environmental Disclosure on Financial Performance of Firms Listed at Nairobi Securities Exchange, Kenya. *International Journal of Sustainability Management and Information Technologies*, 2 (1), 1-6.



- Gentry, R. J., & Shen, W. (2010). The Relationship between Accounting and Market Measures of Firm Financial Performance: How Strong is it? *Journal of Management Issues*, 514 – 530.
- Graff, R. G., Ferskin, E. D., White, A. C., & Bodroell, K. (1998). “Snapshots of Environmental Cost Accounting”. United State Environmental Protection Agency, *Environmental Accounting Project*. 1-6
- Griffin, J. J., & Mahon, J. F. (1997). The Corporate Social Performance and Corporate Financial Performance Debate; Twenty-five Years of Incomparable Research. *Business Society*, 36 (1), 5 – 31.
- Hackson, D., & Milne, M. J. (1996). Some Determinants of Social and Environmental Disclosures in New Zealand Companies. *Accounting, Auditing & Accountability Journal*, 9 (1), 77 – 108.
- Hart, S. L., & Ahuja, G. (1996). “Does it Pay to be Green? An Empirical Examination of the Relationship between Emission Reduction and Firm Performance”. *Business Strategy and the Environment*, 5, 30 – 37.
- Hughes, S. B., Anderson, A., & Golden, S. (2001). Corporate Environmental Disclosures: are they Useful in Determining Environmental Performance. *Journal of Accounting and Public Policy*, 3 (20), 217 – 240.
- Innocent, O.C., Okafor, T. G., & Egolom, P. (2014). An Assessment of Environment Information Disclosure Practices of Selected Nigerian Manufacturing Companies. *International Journal of Finance and Accounting*, 3 (6), 349 – 355.
- Itawa, H., & Okada, K. (2011). How does Environmental Performance affect Financial performance? Evidence from Japanese Manufacturing Firms. *Ecology and Economics*, 70, 1691 – 1700.
- King, A. A., & Lenox, M. J. (2001). Does it Really Pay to be Green? An Empirical Study of Firm Environmental and Financial Performance. *Journal of Industrial Ecology*, 5 (1), 105 – 116.
- Konar, S., & Cohen, M. A. (2001). “Does the Market Value Environmental Performance?”. *The Review of Economics and Statistics*, 83 (2), 281 – 289.
- Lee, D.D., Faff, R.W., & LangField-Smith, K. (2009). Revisiting the Vexing Question: Does Superior Corporate Social Performance lead to Improve Financial Performance? *Australian Journal of Management* 34(1), 21 – 49.
- Leitao, N. C. (2015). Energy Consumption and Foreign Direct Investment: a Panel Data Analysis for Portugal. *International Journal of Energy Economics and Policy*, 5 (1), 138 – 147.
- Magara, R., Aming’a, N. N., & Momanyi, E. (2015). Effects of Environmental Accounting on Company Financial Performance in Kisii County. *British Journal of Economic, Management and Trade*, 10(1), 1-11.
- Mahoney, L., & Roberts, R.W. (2007). Corporate Social Performance, Financial Performance and International Ownership in Canadian Firms. *Accounting Forum*, 3(3), 233 – 253.
- Malarvizhi, P., & Matta, R. (2016). Link between Corporate Environmental Disclosure and Firm Performance: Perception or Reality. *Review of Intergrative Business and Economics Research*, 5(3), 1- 24.
- McWilliams, A., & Siegel, D. S. (2000). Corporate Social Responsibility and Financial Performance: Correlation or Misspecification? *Strategic Management Journal*, 21 (5), 603 – 609.
- Mgbame, C.O., & Illaboya, O.J. (2013). Environmental Accounting, Audit Decision and Firm Performance: An Empirical Investigation. *Journal of Modern Accounting and Auditing*, 9(4), 447-458.
- Moneva, J., & Llana, F. (2000). Environmental Disclosures in the Annual Reports of Large Companies in Spain. *The European Accounting Review*, 9(1). 7 – 29.
- Muoghalu, M. Robinson, H. D., & Glascock, J. (1990). Hazardous Waste Lawsuits, Stockholder returns and Deterrence. *Southern Economic Journal*, 57, 357 – 370.
- Nelling, E., & Webb, E. (2006). Corporate Social Responsibility and Financial Performance: The Virtuous Circle Re-visited. *Working Paper, Drexel University and Federal Reserve Bank of Philadelphia*
- Nikolaev, A. (2003). Factors that Determine the need of Environmental Management Accounting in Industry: Case Study of Trelleborg AB. *Thesis for Masters of science in Environmental Management and Policy* (unpublished). University of Lund, Sweden.
- Nor, N., Bahari, N., Adnan, N., Kamal, S. and Ali, I., 2016. The Effects of Environmental Disclosure on Financial Performance in Malaysia. *Procedia Economics and Finance*, [online]117-126. Available at: <<http://www.sciencedirect.com/science/article/pii/S2212567116000162>> [Accessed 10 Oct. 2016].
- Oba, V. C., Fodio, M. I., & Soje, B. (2012). The Value Relevance of Environmental Responsibility Information Disclosure in Nigeria. *Acta Universitatis Danubius. OEconomica*, 8(6), 100-113
- Ochiri, G., Wario, G., Odhiambo, R. and Arasa, R., 2015. Effects Of Waste Reduction Strategy On Firm Performance: A Survey Of Publishing Firms In Kenya. *International Journal of Economics, Commerce and Management*, [online] 3(5). Available at: <<http://ijecm.co.uk/wp-content/uploads/2015/05/3581.pdf>> [Accessed 10 Oct. 2016]



- Omnamasivaya, B., & Prasad, M. S. V. (2017) Does Financial Performance really Improve the Environmental Accounting Disclosure Practices in India: an Empirical Study From 34 Nifty companies. *African Journal of Economics and Sustainable Development*, 6 (1), 52 – 66.
- Ong, T. S., Tho, S. H., Gog, H. H., Thai, S. B., & Teh, B. H. (2016). The Relationship between Environmental Disclosures and Financial Performance of Public Listed Companies in Malaysia. *International Business Management*, 10 (4), 461-467.
- Osuga, V. and Okello, B., 2015. Waste Management And Its Effects On Environmental Performance Of Comply Timber Processing Firm In Nakuru County, Kenya. *International Journal of Economics, Commerce and Management*, [online] 3(6). Available at: <<http://ijecm.co.uk/wp-content/uploads/2015/06/3619.pdf>> [Accessed 10 Oct. 2016].
- Palmer, H. J. (2012). Corporate Social Responsibility and Financial Performance: does it pay to be good. An CMC Senior Thesis (unpub.) Claremont Mckenna College . Accessed at <http://scholarship.claremont.edu/cmc-theses/529> on 2/7/2017.
- Purnomo, P.K., & Widianingsih, L.P. (2012). The Influence of Environmental Performance on Financial Performance with Corporate Social Responsibility (CSR) Disclosure as a Moderating Variable: Evidence from Listed Companies in Indonesia. *Review of Integrative Business and Economics*, 1(1), 57 – 69.
- Rahman, S. A., Yusoff, R. B., & Mohammed, W. N. (2009). Environmental Disclosure and Financial Performance: An Empirical Study of Malaysia, Thailand and Singapore. *Social and Environmental Accountability Journal*, 29 (2), 46-58.
- Richard, P., Devinney, T., Yip, G., & Johnson, G. (2009). Measurement Organisational Performance towards Methodological best Practice. *Journal of Management*, 35, 718 – 804.
- Rodrigues, F. J. G., & Cruz, Y. M. A. (2007). Relationship between Social-Environmental Responsibility and Performance in Hotel Firms. *Hospitality Management*, 26, 824 – 839.
- Rokhmawati, A. (2015). The Effect of Greenhouse Gas Emissions on Financial Performance of Listed Manufacturing Firms in Indonesia. A Doctor of Business administration Thesis (unpublished). Submitted to University of Canberra, Canada.
- Russo, M. V., & Fouts, P. A. (1997). A Resource-based Perspective on Corporate Environmental Performance and Profitability. *Academy of Management Journal*, 40, 534-539.
- Salema, A. (2005). A Note on the Impact of Environmental Performance on Financial Performance. *Structural Changes and Economy Dynamics*, 16 (3), 413-421.
- Saleh, M., Zulkifli, N., & Muhammad, R. (2011). Looking for evidence of the Relationship Between corporate Social Responsibility and Corporate Financial Performance in an Emerging Markets. *Asia-Pacific Journal of Business Administration*, 3 (2), 165-190.
- Sarkis, J., & Cordeiro, J. J. (2001). An Empirical evaluation of Environmental Efficiencies and Firm performance: Pollution Prevention versus End-of-Pipe Practice. *European Journal of Operational Research*, 135, 102-113.
- Setyorini, C.T., & Ishak, T.Z. (2012). Corporate Social and Environmental Disclosure: A Positive Accounting Theory View Point. *International Journal of Business and Social Science*, 3(9), 152 – 164.
- Sinha, A. (2015). Modeling Energy Efficiency and Economic Growth: Evidences from India. *International Journal of Energy Economics and Policy*, 5 (1), 96-104.
- Spicer, B. H. (1978). Market Risk, Accounting Data and Companies Pollution Control Records. *Journal of Business Finance and Accounting*, 5 (1), 67-83.
- Suchman, M.C. (1995). Managing Legitimacy: Strategic and Institutional Approaches. *Academy of Management Review*, 20(3), 571 – 610.
- Suleiman, M., & Moktar, N. (2009). Environmental Management Accounting: some Empirical evidence from Malaysia. *Articles of Merit Award on PAIB 2009*, 11-51.
- Togun, O.R., & Nasieku, T. (2015). Effect of Corporate Social Responsibility on Performance of Manufacturing Companies in Nigeria. *International Journal of Current Advanced Research*, 4(8), 228 – 233.
- USEPA. (1996). *Environmental Accounting Case Studies: Full Cost Accounting for Decision Making at Ontario Hydro*. Washington, EPA.
- Vasanth, V., Selvam, M., Lingaraja, K., & Ramkumar, R. R. (2015). Nexus Between Profitability and Environmental Performance of Indian Firms: an Analysis with Gramger Causality. *International Journal of energy Economics and policy*, 5 (2), 433- 439.
- Venkatraman, N. & Ramanujam, V. (1987). Measurement of Business Economic Performance: An Examination of Methods Convergence. *Journal of Management*, 13, 109-122.
- Vinayagamoorthi, V., Murugesan, S. & Kasilingam, L. (2015), “Impact of Firms' Profitability on Environmental Performance: Evidence from Companies in India”, *Mediterranean Journal of Social Sciences*, 6(1), 109-119.



TIMBOU-AFRICA ACADEMIC PUBLICATIONS
NOV., 2022 EDITIONS, INTERNATIONAL JOURNAL OF:
FINANCIAL RESEARCH & MGT. SCIENCE VOL. 11

- Vijfvinkel, S., Bouman, N., & Hessels, J. (2011). Environmental Sustainability and Financial Performance of SME's Zoetermeer. *Scales Scientific Analysis of Entrepreneurship and SME's*.
- Waddock, S.A., & Graves, S.B. (1997). The Corporate Social Performance-Financial Performance Link. *Strategic Management Journal*, 18(4), 303 – 319.
- Wagner, M., Vanphu, N., Azomahon, T., & Wehrmeyer, W. (2002). The Relationship between the Environmental and Economic Performance of Firms: an Empirical Analysis of the European Paper Industry. *Corporate Social Responsibility and Environmental Management*, 9 (3), 133-146.
- World Bank Group. (2005). *Extractive Industries and Sustainable Development: AN Evaluation of World Bank Group Experience*. Washington D. C., The World Bank
- Zeren, F., & Koc, M. (2014). The Nexus between Energy Consumption and Financial Development with Asymmetric Causality Test: Evidence from Newly Industrialized Countries. *International Journal of Energy, Economics and Policy*, 4 (1), 83-91.