

# Imperative of Environmental Cost on Equity and Assets of Quoted Manufacturing Firms in Nigeria

Dr. Odogu, Laime Isaac; Dadiowei, Opritari Maxwell

School of Commerce and Management, Bayelsa State Polytechnic,  
Aleibiri Ekeremor Local Government Area, Bayelsa State, Nigeria

## ABSTRACT

This study examine the imperative of environmental cost on equity and assets of quoted manufacturing firms in Nigeria. The study adopts ex-post facto, content analysis and regression research design. The research adopts secondary source of data in obtaining all the data needed for the study, extracted from the audited financial statements of the sampled manufacturing firms, which is meticulously examined and relevant data extracted from the period of 2011-2018 for analysis, in line with the main objective. Hypothesis is tested and the results reveals that environmental cost has a significant effect on return on equity and return on assets of quoted manufacturing firms in Nigeria. In consonance with this study's findings, it is recommended that, Firms in Nigeria should invest reasonable amount on environmental issues and report same in their financial reports for the various stakeholders to see. This will create a good relationship with the host community which will enable growth in production and increase in turnover.

**KEYWORDS:** equity, assets turnover, environmental cost, component

## INTRODUCTION

Environmental costs have been expanded to account as product design for sustainability, recycling and disassembly; process design to reduce environmental impact of operations; worker training; research and development. The various government regulations, societal pressure groups and green consumer pressure are some of the current trends and recent developments reawakening corporate attention to the strategic and competitive role of a firm's environmental responsibility to corporate performance (Ifurueze, Lyndon & Bingilar, 2013). Although voluntary, financial reports of firms that are without adequate disclosure of environmental cost information may be seen to be incomplete. Commitment to the natural environment has become an important variable (Unamuno, 2011), behaving in a socially responsible manner is increasingly seen as essential to the long term survival of companies (Adams and Zutshi, 2014). This is because failure to include environmental cost information in financial reports might affect the ability of various stakeholders

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of the firm to make sound decisions. Activities of business organizations especially those in the manufacturing sector have led to such environmental pollutions. Also, unsustainable use of natural resources by the firms has caused increase in the emission of greenhouse gases in our society. This consequently results in depletion of the ozone layer and global warming. As a result of this, the role of companies in addressing environmental and sustainability issues is deemed very vital (Adams & Busola, 2015). Sequel to the global awareness on environmental issues, firms have come under intense pressure to meet up with the requirements of the current generations without compromising the capacity of the subsequent generations by engaging in environmental engineering activities which has led to additional cost on them (Deegan, 2010). Hence, firms are expected to show accountability of their conducts and activities that took place in the society and the natural atmosphere. However, it is worth taking into consideration by organizations that being

environmentally responsible will increase costs to the organization which in turn reduces the level of company's performance (Nadeem, 2012). Bassey, Effiok and Eton (2013) states that environmental accounting is referred to as the way and manner by which firms communicate the environmental effects of their activities and how they have tried to resolve it in the best interest of all relevant stakeholders. Deegan (2010) further stated that, firms through the process of communication of environmental accounting information may seek to influence the public's perception towards their operations and create a good image. Firms also incur environmental costs by contributing to both corporate public relations and media campaigns on environmental issues. Also, being environmentally responsible may direct firms to better resources and increase their employee's motivation which results in creation of unforeseen opportunity within the organization (Ness, 2012). When environmental costs are not adequately allocated by firms, cross-subsidization occurs between products (Nadeem, 2012). Most companies do not know the extent to which their environmental cost information can influence their heir activities on the environment which in so doing will put them in the good books of other stakeholders and will have an effect on their corporate performance. Susi (2019); De Viviers performance and thus tend to underestimate them. This means that if they are not assessing such information, it implies that they are not monitoring and reporting them.

Manufacturing firms in Nigeria need to be fully accountable for the true cost of the impact of there activities, Staden (2010); Galani (2011) all carried out their studies on environmental cost disclosure and corporate performance using content analysis and found out mixed results on environmental cost disclosure in the annual reports of firms and corporate performance. Uwalomwa, (2014); Ajibolade and Uwalomwa, (2013) used the mixture of both survey and regression research design to explain the effect of environmental cost disclosure on corporate performance of firms and they too found out mixed results. As a result of the methodology employed by past authors and their mixed results, this study will assess the imperative of environmental cost on equity and assets of quoted firms in Nigeria using both content analysis and regression research design.

### **Objective of the Study**

The main objective of this study is to examine the imperative of environmental cost on the equity and assets of quoted manufacturing firms in Nigeria. The specific objectives include to;

Examine the impact of environment cost on return on equity of quoted manufacturing firms in Nigeria.

Determine the impact of environment cost on return on asset of quoted manufacturing firms in Nigeria.

The following hypotheses is formulated to be tested in this study:

Ho<sub>1</sub>: Environmental cost has no significant impact on return on equity of quoted manufacturing firms in Nigeria.

Ho<sub>2</sub>: Environmental cost has no significant impact on return on asset of quoted manufacturing firms in Nigeria.

### **LITTERATURE REVIEW**

This part deals with review of related literature in this other: Theoretical Framework, Conceptual Framework; And Empirical Review.

#### **Theoretical Framework**

This work is discussing three theories to back up our theoretical background but the main anchor is the stakeholder theory.

**Stakeholder Theory:** Stakeholder theory was embedded in the management discipline in 1970 and gradually developed, incorporating corporate accountability to a broad range of stakeholders. The basic proposition of the stakeholder theory is that the firm's success is dependent upon the successful management of all the relationships that a firm has with its stakeholders. When viewed as such, the conventional view that the success of the firm is dependent solely upon maximizing shareholders wealth is not sufficient because the entity is perceived to be a nexus of explicit and implicit contracts (Jensen & Meckling, 2016) between the firm and its various stakeholders. The stakeholder theory asserts that corporation's continued existence requires the support of the stakeholders and their approval must be sought and the activities of the corporation adjusted to gain that approval (Chan, 2016). The more powerful the stakeholders, the more the company must adapt. Environmental reporting is thus seen as part of the dialogue between the company and its stakeholders (Gray, Kouhy & Lavers, 2015). The definition of stakeholder has altered substantially over the past four decades. At one end of the spectrum, the shareholder was considered the sole or principal stakeholder. This definition was based on arguments proposed by Freeman (2012) that the corporation's foremost objective is to maximize the wealth of its owners. That is, it was borne out of a reaction to the traditional research approach (Freeman, 2012) which presumes that in valuing the behaviour of firms, we only need to take into account the shareholders' interest. Kassinis and Vafeas (2016), however, expand the definition of stakeholder to include a broader selection of constituents including adversarial groups such as interest groups and regulators. Both

the narrow (shareholder) and the expanded definition of stakeholders have been adopted in the development of voluntary environmental disclosure regulations for corporations. Stakeholders control or have the ability to affect (directly or indirectly) control of resources required by the corporation (Tapang & Bassey, 2017). Thus, stakeholder's power is determined by the level of control they have over the resources. Therefore, stakeholder theory is generally concerned with the way an organization manages its stakeholders. It is a theory that is based on the notion that companies have several stakeholders defined as groups and individuals who benefit from or are harmed by, and whose rights are violated or respected by corporate actions (Freeman, 2016), with an interest in actions and decisions of companies. Within these contexts, different strands of stakeholder theory can be discerned (Branco & Rodrigues, 2017).

**Legitimacy Theory:** Legitimacy theory was expounded by Dowling and Pfeffer in (1975) and is commonly described as the congruence between an organization's value system and that of the larger social system of which the organization is a part. Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions. Dowling and Pfeffer (2015) state that organisations seek to establish congruence between the social values associated with or implied by their activities and the norms of acceptable behaviour in the larger social system of which they are a part. Insofar as these two value systems are congruent, we can speak of organisational legitimacy. Using the legitimacy perspective, firms voluntarily disclose environmental information to show that they are conforming to the expectations and values of the society within which they operate. Guthrie and Parker's (2018) are one of the early and very influential authors in the corporate social reporting literature. They argue that if the legitimacy explanation holds true, then corporate disclosure policies will react to major social and environmental events. On the other hand, Deegan and Rankin (2016) suggest that social expectation no longer rests upon mere generation of profit but has broadened to include health and safety of employees and local communities as well as concern for the natural environment. Therefore, firms need to provide voluntary environmental information to meet the broad expectations of society relating to employees' welfare, community and the treatment of the natural environment. They suggest that legitimacy theory is useful in analysing corporate behaviour. This is because legitimacy is important to organisations, constraints imposed by social norms and values and

reactions to such constraints provide a focus for analysing organisational behaviour taken with respect to the environment. The legitimacy theory argues that organisations seek to ensure that they operate within the bounds and norms of society. Society's expectations have changed to expect businesses to make outlays to repair or prevent damage to the physical environment, to ensure the health and safety of consumers, employees, and those who reside in the communities where products are manufactured and wastes are dumped (Tinker & Niemark, 2017). Corporate environmental disclosures are an important way for organisations to establish and maintain their legitimacy, providing an explanation why organisations make environmental disclosures. Legitimacy can be considered as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions". To this end, organisations attempt to establish congruence between "the social values associated with or implied by their activities and the norms of acceptable behaviour in the larger social system of which they are part". Consistent with this view, Richardson (2017) asserts that environmental disclosures is legitimating institution and provides a "means by which social values are linked to economic actions". Organisational legitimacy is not a steady state, but variable. This variability is not only temporal, but also spatial or across stakeholder and cultural groups. Therefore, depending on an organisation's perception of its state or level of legitimacy, an organisation may employ legitimization strategies (Lindblom, 2019). Organisational legitimacy can be constructed or enhanced through the use of symbols or symbolic action communicating a public image. This image is aligned with the organisations' primary goals, methods of operation or output. (Tinker & Niemark, 2017). and Lindblom (2019) suggest four broad legitimization strategies that organisations may adopt when faced with a threat to their legitimacy or a perceived legitimacy gap. A legitimacy gap occurs when corporate performance does not match the expectations of relevant public or stakeholders. In a bid to restore, maintain or enhance organisational legitimacy, an organisation may: a) Change its output, methods or goals to conform to the expectations of its relevant publics, and then inform these relevant publics of the change; b) Not change its output, methods or goals, but demonstrate the appropriateness of its output, methods or goals through education and information; c) Try to alter the perceptions of relevant publics by associating itself with symbols that have a high legitimate status; and d) Try to alter societal expectations by aligning them

with the organisation's output, goals or methods. By definition, corporate environmental disclosure should conform to at least one of the above strategies as the implementation of any legitimisation strategy must involve both communication (disclosure) by the organisation as well as addressing norms, values or beliefs of relevant publics. This is consistent with a legitimacy explanation of managerial motivation for corporate environmental disclosures. The multiplicity of legitimacy dynamics creates considerable latitude for managers to manoeuvre strategically within their environments. Admittedly, no organisation can completely satisfy all audiences, and no manager can completely step outside of the belief system that renders the organisation plausible to itself as well as to others. Though, at the margin, managerial initiatives can make a substantial difference in the extent to which organisational activities are perceived as desirable, proper, and appropriate within any given cultural context; it is seen as one of the strategies used by companies to seek acceptance and approval of their activities from society. In addition, it is also seen as an important tool in corporate legitimisation strategies, as it may be used to establish or maintain the legitimacy of the company by influencing public opinion and public policy. It is pertinent to note that although the legitimacy theory appears to be the most widely used theory to explain environmental disclosure practices of a firm (Guthrie & Parker, 2019; Adams, Hill & Roberts, 2018; Wilmhurst & Frost, 2020) suggested that the existence of and size of legitimacy gap may be difficult to measure where a disparity exists between the expectations of the corporation and those of its relevant.

**Voluntary Disclosure Theory:** Voluntary disclosure theory has its roots from agency theory, Brammer and Pavelin, (2018). Voluntary disclosures are attempts to remove informational asymmetries between the firm and external agents, primary agents in the investment community. Voluntary disclosures theory is based on the agency theory perspective which explains the level of disclosure of information. The voluntary disclosure theory predicts that organisations which have a good environmental performance do not hide the environmental impacts of their operations and are willing to inform stakeholders about their environmental activities. Voluntary disclosure predicts that the information risk for current and potential investors will be lowered (Brammer & Pavelin, 2018). Voluntary disclosure can lead to a competitive advantage because it highlights the environmental Programme and the impact of activities on the national environment. Stakeholders receive bad news from the company along with good news. Investments in environmental management or

programs are costly and for the short term, they will not result in higher returns. If disclosure is absent or low, stakeholders will assume that the current environmental strategy adopted by the firms is inferior (Clarkson, Li, Richardson & Vasvari, 2018). Superior environmental performers truly disclose issues regarding environmental affairs, the quality of their disclosures is superior to the quality of the weak environmental performers. The superior firms believe that their strengths will outweigh the weaknesses and do not fear the reaction of any stakeholder (Clarkson, Li, Richardson & Vasvari, 2018).

## Conceptual Framework

### Components of Environmental Cost Disclosure

Dragomir and Anghel-ilcu (2011) identified the basic components of environmental accounting information disclosure. However, there is no unique component of good environmental disclosures that can be adopted by all companies. Companies should design and implement strategies in the light of regulatory framework that will produce an efficient, qualitative and result-oriented outcome, for quality financial reporting in the interest of stakeholders. Effective environmental cost disclosure should be designed in line with the circumstance surrounding each entity and continuously reviewed according to the changing circumstance of the time. However, for companies which intend to compete internationally, the following are recommended by Dragomir (2011) as basic environmental cost disclosures components:

- \*Environmental Restoration
- \*Environmental Fines and Penalties
- \*Environmental Donations and Sponsorship
- \*Environmental Compensation
- \*Environmental Waste Management

**Environmental Restoration Cost:** Environmental Restoration cost provisions are recorded when the company has obligations to undertake restoration, rehabilitation and environmental work, especially, when environmental disturbance is caused by the development or on-going production at the companies' site. These costs are estimated at the beginning of the asset's useful life. The future expenses in site restoration may also be derived as a consequence of the continuous use of an asset whose environmental impact is not negligible. However, Price-water house coopers, considers that, whenever environmental degradation is outside the industrial parameters for the use of a certain asset, the supplementary expenses should be incurred immediately. Provisions for clean-up costs are persistent elements, that is, they are recognized at one point in time and may be found unaltered for several financial years in the statement of financial position. The following are a selection of environmental

restoration: (a) Anglo American: Obligations to undertake restoration, rehabilitation of environmental work when environmental disturbance is caused by the plant; (b) Rio Tinto: Close down and restoration expenditures incurred at the end of the relevant operations (c) Morrison: Property provision comprises provisions for dilapidation on lease buildings. (d) GDF Suez: Provision for rehabilitating land on which former plants were located (Price-water house coopers, 2014)

**Environmental Fines and Penalties:** This category comprises current operating expenditures (immediately recognized in the income statement). These are costs borne by an organisation for the violation of the rule and regulation guiding specific environmental issues. Penalty and associated costs incurred as expense are expected to be fully disclosed in the organisations' financial statements. Fine and penalty have an inverse relationship with company's performance; they reduce profit and the return on assets. The following are a selection of examples concerning environmental fines and penalties: DANONE: Fines paid for not reducing atmospheric waste. Aeroports de Paris: Penalties paid for not reducing the negative environmental impact, the treatment of surface runoff and elimination of hazardous waste. Johnson Matthey: A violation related to the selective screening of wastewater samples for compliance analysis (Dragomir 2011).

**Environmental Donations and Sponsorship (EDS)** This category consists of voluntary environmental donations and sponsorship showing the companies commitments towards the community and the natural environment. On the other hand, taxes paid for environmental purposes are disclosed in a manner that demonstrates extreme attention for the company's public image. These payments are mandatory for improving the companies' public perception. The following are a selection of environmental donations and sponsorship: (a) Casino Guichard: Eco-packing tax and eco- contribution on promotional brochures; (b) Cadbury: Expenditures incurred in respect with charitable purposes: Education and enterprise, environment, health and welfare (Dragomir, 2011).

**Environmental Compensation Cost:** Under common law and some states and federal statutes, companies may be obligated to pay for compensation of "damages" suffered by individuals, their property, and businesses due to use or release of toxic substances or other pollutants. These liabilities may occur even if a company is in compliance with all applicable environmental standards. Distinct subcategories of compensation liability include

personal injury (e.g., "wrongful death," bodily injury, medical monitoring, pain and suffering), property damage (e.g., diminished value of real estate, buildings, or automobiles; loss of crops), and economic loss (e.g., lost profits, cost of renting substitute premises or equipment). Compensation costs can be fairly minor or quite substantial, depending on the number of claimants and the nature of their claims. Often times, legal defense costs (potentially including technical, scientific, economic, and medical studies) can be substantial in handling such claims, even when the claims are ultimately determined to be without merit. Moreover, responding to compensation claims can consume management time and require expenditures in order to control damage to corporate image. Compensation liabilities may involve costs for remediation of contaminated property as well as provision of alternate water supplies, thus somewhat overlapping the remediation category. Because of workers' compensation and employer liability laws, payments to compensate employees for occupational exposure and injury from hazardous or toxic substances are not generally determined through litigation against the employer or considered environmental liabilities. However, occupational claims sometimes may be brought against another party who is not the employer; for example, workers responding to a train wreck have sued the shipper of hazardous wastes released at the scene of the wreck; for the shipper, these claims can be viewed as environmental liabilities. Managers will want to understand the potential costs of occupational exposure and injuries, because actions taken to prevent or reduce environmental liabilities may also eliminate or reduce occupational liabilities (Dragomir & Anghel-ilcu 2011)

**Environmental Waste Management Cost:** Environmental waste management involves sensing what is there, sorting, separating, transforming, returning to service what can be used and properly disposing what is left (Rose, 2017). According to Ghush, (2019) waste is inevitable human activities. They are either a by-product of initial production process or they arise when objects or materials are discarded after they have been used. Disposing of waste has a huge environmental impact and can cause serious environmental problems. Novick (2019) enumerated the accounting for waste management in any community, town or city as follows: associate cost on the reduction in the speed of sanitation related diseases, reduction on occurrence of non-communicable diseases and reduction on environmental pollution (degradation of land, water and air). All manufacturing firms are expected to

make a report on the associated cost incurred in the management of waste. This is because stakeholders required this information to evaluate the organisation's responsibility to environmental matters and the activities the organisation must have engaged in, to circumvent environmental degradation. However, the cost incurred by the organisation reduces the organisation's performance but these are expenses that should be better incurred to further accomplish the aim of satisfying consumer both in the production of goods and services and engaging in environmentally friendly activities.

### Concept of Environmental Disclosure

Environmental accounting is an innovative sustainability initiative that has been defined by Steele and Powell (2012) as that aspect of accounting which has to do with the identification, allocation and analysis, of material streams and their related money flows by using environmental accounting systems to provide insight into environmental impacts and associated financial effects. Pramanik (2017), refers to environmental disclosure as the process by which a corporation or an organization communicates its information regarding the range of its environmental activities to a variety of stakeholders. They went further to define environmental cost disclosure as the assessment of the impact of environmental issues on the company's financial performance and this requires changes to the way the company discloses environmental issues in their annual reports. The aim of environmental reporting is to fulfill accountability and transparency purposes while providing useful information for timely and appropriate decision making by interested parties. Moreover, environmental reports are ways in which the company provides information to meet the financial markets requirement. Pramanik (2017) further expressed the environmental cost reporting as the company's way for the provision of information about environmental performance, and meeting financial markets and at the same time providing itself with a positive environmental image. In addition, environmental reporting is considered as a valuable evaluation tool for corporations and individuals, when making investment decisions (Adediran & Alade, 2013). While, Daferighe (2010) and Peskin (2019) viewed environmental accounting as a tool that can be used to determine less tangible and external costs for projects and activities, such as bio-diversity, human health and aesthetic values. It is also aimed at broader issues such as implementing sustainable business practice to conserve natural resources for future generations. Environmental accounting must, therefore, be designed such that it provides information enabling users' access to environmental behaviour of the

company and its economic consequence. Therefore, parts of the system are both information in monetary units (financial information) and information in physical units (non-financial information). Furthermore, it is necessary to ensure that different information needs of various interested parties are filled. It also means that the conception of environmental accounting is based on the basic recognition influencing the development of accounting system in the 20th century. The method of reflecting the business process should be differentiated according to the users of the accounting information and according to decision-making tasks for support of which the accounting information is used (Dechow & Dichev 2012). To include environmental information in the accounting system of a company is one way to start to include sustainable development in everyday business decisions. A very important function of environmental accounting is to bring environmental costs to the managers; therefore, motivating them to identify ways to reduce and avoid economic costs related to the environment and at the same time reduces the company's environmental impact. Daferighe, (2010) stated that Environmental Accounting can be broken down into three disciplines, namely: National Environmental Accounting (NEA); Global Environmental Accounting (GEA); and Corporate Environmental Accounting (CEA).

The Corporate Environmental Accounting is further sub-divided into Environmental Management Accounting (EMA) and Environmental Cost Reporting (Disclosure) (ECR). The focus of this study is on Environmental Cost Disclosure aspect of Corporate Environmental Accounting, which Uwalomwa (2014) describes as the process that involves communicating the social and environmental effects of organisations' economic actions to particular interest groups within the society. Furthermore, Environmental Reporting Guidelines (2012) defines Environmental Disclosure as the systematic and holistic statements of environmental burden and environmental efforts in organisations' activities, such as environmental policies, objectives, programs and their outcomes, organisational structures and systems for the environmental activities, in accordance with general reporting principles of Environmental Disclosure, which is published and reported periodically to the general public. The source further revealed that Environmental Disclosure aims at promoting communication of organisations, fulfilling accountability regarding environmental efforts in their activities, and providing useful information to

decision makers and interested parties. Srinivasa (2014) described Environmental Disclosure as the communication of environmental performance information by an organisation to its stakeholders. The author listed the information on environmental performance to include the following, among others; impacts on the environment, Performance in managing those impacts, and Contribution to ecological and sustainable development. Srinivasa (2014) also stated that Environmental Cost Disclosure can be considered a sort of small world, where many crucial points in the relationship between a company and its stakeholders meet together. He divided Environmental Cost Disclosure into three categories as follows:

**Involuntary Disclosure:** The disclosure of information about a company's environmental activities without its permission and against its will. Examples of involuntary disclosures are environmental campaigns, press and media revelations and court investigations. **Mandatory Disclosure:** The disclosure of information about a company's environmental activities that is required by law. **Voluntary Disclosure:** The disclosure of information on voluntary basis. The voluntary disclosure is further subdivided into confidential and non-confidential voluntary disclosure, where confidential disclosures are described as those required by banks, insurers, customers and joint venture partners that are not publicly available, non-confidential voluntary disclosures are strategic-potential information with strategic benefits which helps to improve the company's image and build better relations with relevant stakeholder groups. As stated by Khuntia (2014), Corporate Environmental Cost Disclosure describes various means by which companies disclose and communicate company's environmental performance and environmental activities to the users. Corporate environmental cost disclosure is the process by which a corporation communicates information regarding the range of its environmental activities to a variety of Stakeholders including employees, local communities, shareholders, customers, government and environmental groups.

**Performance** The definition of performance and its measurement continues to challenge scholars due to its complexity. This study attempts to contribute to this effort by creating and testing a subjective scale of performance that covers the domain of business performance in the words of (Venkatraman & Ramanujam 2016). The conceptualization of performance in this study is based on the stakeholder theory, which allows distinguishing between

performance antecedents and outcomes. It also provides a conceptual structure to define performance indicators and dimensions. The fact that profit and growth are relevant motives for the existence of a business firm and must be included in any attempt to measure performance is indisputable. The question is: what else is relevant and should be considered as well? In this case, stakeholder theory help by Measuring performance under this conceptualization which involves identifying the stakeholders and defining the set of performance outcomes that measure their satisfaction (winter, 2013). The stakeholder theory offers a social perspective to the objectives of the firm and, to an extent it conflicts with the economic view of value maximization (George, 2015). Such ontological discussion is within the scope of this study. The stakeholder theory has found its way into the corporate and academic world. It is possible to see its influence in corporate annual reports. The use of stakeholders' satisfaction as firm performance was also adopted by a large number of different authors like (Venkatraman & Ramanujam, 2016; Varadejan & Ramanujam, 2019;). Besides offering a way to decide what performance is in a comprehensive way, the use of this theory allows one to resolve the issue of differentiating between performance antecedents and outcomes. Performance measures assess the satisfaction of at least one group of stakeholders. This conceptualization of firm performance is applicable across different companies, as acknowledged by Goerzen and Beamish, (2013), allowing one to differentiate between high and low performers in the eyes of each stakeholder using indices such as profitability, increase in equity and assets, Turnover rate and Earnings per share (Fitzgerald & Storbeck, 2013).

Superior financial performance is a way to satisfy investors and can be represented by profitability, growth (Turnover rate), and market values (Earnings per share) (Fitzgerald & Storbeck, 2013). These three aspects complement each other. Profitability measures a firm's past ability to generate returns (Waren, 2016)). Growth demonstrates a firm's past ability to increase its size and meets its cash demands (Graham, 2019). Increasing size, even at the same profitability level, will increase its absolute profit and cash generation. Larger size also can bring economies of scale and market power, leading to enhanced future profitability. Market value represents the external assessment and expectation of firms' future performance in terms of the firm's ability to satisfy shareholders. It should have a correlation with historical profitability and growth levels, but also incorporate future expectations of market changes and competitive moves.

## Empirical Review

Wilmhurst and Frost (2020) examined the relationship between factors perceived as important by chief financial officers in the decision to disclose as well as the observed disclosure of environmental information within the annual report. The survey involved a selected sample from the top 500 listed Australian companies from 1994 to 1995, which is based on the total revenue of the trading companies. Using stratified random sampling method, an initial sample of 105 companies from environmentally sensitive industry was selected. The industry groups selected were; (1) chemical, (2) mining and resources, (3) oil, gas and petroleum, (4) transport or tourism, (5) manufacturing, (6) construction, and (7) food and household. The result of the study showed that the factors considered most important by chief financial officers in the decision to disclose environmental information were; Shareholders' or investors' right to information (also ostensibly to provide a "true and fair" view of operations), Legal obligations and "due diligence" requirements; Community concerns

Daferighe and Money (2019) carried out a study on environmental accounting practices by corporate firms in emerging economies, with empirical evidence from Nigeria. The study was aimed at assessing the impact of government legislations on environmental accounting practice and compared current practices across firms in different sectors of the economy. The study used chi square on 25 quoted firms in the Nigerian stock exchange, covering various sectors of the economy. The study revealed that the input of plant environmental staff is important in cost categorization and tracking of cost in developing an environmental management system. It was discovered that legal staff labour time and natural resources damages are the least internal costs included in environmental project financial evaluation. It was established in this study that the establishment of an Environmental Management System (EMS) is essential for corporate firms in Nigeria. This is an important task to ensure that all relevant, significant costs are considered when making business decisions. Findings revealed that much attention has not been given to cost of natural resources damages in project evaluation. The study recommended that Government should step-up its enlightenment Programme on policies and laws on environmental protection in order to increase awareness amongst corporations operating in the country. Also, the relevant agencies should ensure enforcement of and compliance with these policies and laws. Companies should endeavor to make use of environmental cost and performance information for designing environmentally preferable processes or

products. This will result in improved profitability and a reduction in environmental risk.

Emenyi (2019) undertook a study on environmental cost accounting and the cost of environmental damages on stakeholder's well-being in Nigeria's south-south geo-political zone. The study was to examine whether oil and gas companies pay close attention to the environment as a form of corporate social responsibility. This was hinged on the inadequate measurements and disclosure of the cost effect of environmental damages on the well-being of the inhabitants of the affected area of oil spills. A survey research design was adopted while information was elicited from 362 respondents with ANOVA used to test the null hypothesis. The study discovered that it is relevant to measure and disclose the cost of environmental damages on stakeholder's well-being in the environmental reporting of petroleum exploiting firm. The study recommended that oil and gas companies account for the cost of environmental damages on the well-being of the inhabitants of the affected areas in their environmental cost accounting and reporting. Holm and Rikhardsson (2018) studied the effect of environmental disclosure on investment decisions. The results suggest that environmental information disclosure influences investment allocation decisions. This finding would imply that companies that are apathetic to their environmental costs or responsibility might experience eventual crashes on their stock price if their investors are rational in considering the future value of the firm based on its present state of environmental responsibility. Hassel et al. (2018) investigated the effect of environmental information on the market value of listed companies in Sweden using a residual income valuation model. The results show that environmental responsibility as disclosed by sampled companies has value relevance, since it is expected to affect the future earnings of the listed companies. Their findings have implications for companies that pollute the environment – their future solvency may be eroded with gradual depletion in earnings. Turban and Greening (1997) examined the effect of corporate social performance on organizational attractiveness to prospective employees. Ofoegbu (2016) investigated the Corporate Environmental Accounting Information Disclosure in the Nigerian Manufacturing Firms. The study examined the influence of firm characteristics on the quality of Corporate Environmental Accounting Information Disclosure (CEAID) in the Nigerian manufacturing companies. Ex-post facto and content analysis research design were adopted. 10 quoted selected manufacturing firms from 2008-2014 in the annual reports were used in the study and



finding shows that firm financial performance has a significant impact on the quality of CEAIID but firm size had no impact on the quality of CEAIID.

Nwaiwu, and Oluka, (2018) assessed environmental information disclosure practices of selected Nigerian manufacturing companies. Content analysis was adopted in analyzing the annual reports of the selected firms with regards to their environmental disclosure practices. Furthermore, a survey was carried out in order to ascertain whether the environmental disclosure practice of firms in Nigeria has improved. The findings of the study indicated that the environmental disclosure practices of firms in Nigeria is still adhoc and contains little or no quantifiable data. Waren, (2016), carried out research on the impact of environmental cost on “Corporate Performance: A Study of Oil Companies in Niger Delta States of Nigeria”. The study’s main objective was to investigate the impact of environmental cost on corporate performance of oil companies in the Niger Delta States of Nigeria. The field survey methodology was utilized involving a selected sample of twelve oil companies. The multiple regression analysis was explored to test the hypothesis. An investigation was undertaken into the possible relationship between corporate performance and three selected indicators of sustainable business practices: Community Development Cost (CDC), Waste Management Cost (WMC) and Employee Health and Safety Cost (EHSC). The study revealed that sustainable business practices and corporate performance is significantly related; and sustainability may be a possible tool for corporate conflict resolution as evidenced in the reduction of fines, penalties and compensations paid to host communities of oil companies. The study recommended that the management of oil companies in the Niger Delta States of Nigeria should develop a well-articulated environmental costing system in order to guarantee a conflict free corporate atmosphere needed by managers and workers for maximum productivity and eventually improve corporate performance.

Anyanwu (2015) in an empirical study titled “Environmental Management Accounting Techniques and Quality Financial Reporting” was undertaken to assess and explain the extent to which quality environmental reporting disclosures take place in Nigerian listed companies in practice. The study also identified and discussed the possible reasons for the level of quality of reporting. The study adopted a descriptive statistical research method. It revealed that Nigerian companies are making more environmental disclosures than they did five years

ago. The studies further revealed that majority of the companies are making voluntary disclosures of environmental and social policy statements under the heading of Sustainability Report or Corporate Social Reporting (CSR). The study concluded that many of Nigerian companies do not effectively report on environmental matters. Those who report minimal or generic information are inconsistent. The study recommended that Nigerian companies need to do more to demonstrate their commitment to improving their environmental impact via better quality disclosures and linking this information to their financial performance to create better value for all stakeholders. Uwalomwa, (2014) carried out a study on environmental costs and environmental information disclosure in the accounting systems. The study was aimed at examining the extent to which companies’ measure and discloses the destructive environmental waste. This issue should include other cases about accounting for air pollution, water contamination and natural resources extraction. The study adopted descriptive statistical research method. The study revealed that the majority of companies are not willing to disclose the information related to environmental costs in their financial statements, because they believe that this practice would impose some commitments on them. The study recommended that companies’ managers should use company’s financial resources in disclosing social and environmental information as a tool to advertising company’s favorable prestige and strengthen company’s environmental reputation and legitimating their activities in order to affect stakeholders.

## METHODOLOGY

This study adopts ex-post facto, content analysis and regression research design. Ex-post facto research design involves the means of ascertaining the impact of past factors on the present happening of event. Agburu (2017). Content analysis will be employed to measure the environmental cost component of firms in line with the five (5) environmental cost criteria adopted by Dragomir (2011). The research adopts secondary source of data in obtaining all the data needed for the study, extracted from the audited financial statements of the sampled manufacturing firms, which is meticulously examined and relevant data extracted from the period of 2011-2018 for analysis.

**Model specification.** The multiple regression model is stated thus:

$$ROE_{it} = \mathbf{B}_0 + \mathbf{B}_1 \text{LogENCOST}_{it} + \mathbf{B}_2 \text{FSIZE}_{it} + u_{it} \quad (1)$$

$$ROA_{it} = \mathbf{B}_0 + \mathbf{B}_1 \text{LogENCOST}_{it} + \mathbf{B}_2 \text{FSIZE}_{it} + u_{it} \quad (2)$$

ROA = Return on Assets

 $B_0$  = Unknown constant to be estimated

ROE = Return on Equity

 $B_1$  = Unknown coefficients to be estimated

LogENCOST = Log of Environment Cost

 $u$  = Error term

FSIZE = Firm Size

it = Cross section (i) and Time (t)

**DATA PRESENTATION****Descriptive statistics**

In this sub section the descriptive statistics of both the explanatory and dependent variables of interest are examined. Each variable is examined based on their mean, median, maximum and minimum. Table below displays the descriptive statistics for the study.

Descriptive statistics table 1

stats	retoe	retoa	fsize	lencost
mean	14.53509	6.277586	7.043879	.6590517
p50	14.065	6.585	7.02	.67
min	-229.27	-30.28	5.79	.18
max	143.54	34.17	8.55	1
sd	30.82438	9.702944	.6826638	.162683
skewness	-2.196878	-.7338548	.0414519	-.2497983
kurtosis	2.136606	1.578952	2.123601	2.379646
sum	3372.14	1456.4	1634.18	152.9

**Source:** Researcher Computation (2022)

The above table shows that the mean value of financial performance proxy return on equity (retoe) and return on asset (retoa) among the sampled firms were 14.54%, 6.28% and 2.25% respectively. This implies that about 14.54%, 6.28% and 2.25% of the observation shows the level of financial performance. The median value of environmental cost for the sampled companies was 0.67. The maximum value for the study was 1 while the minimum value was 0.18. This therefore means that companies with higher or equal to the median value of 0.67 spend more on environmental cost while companies with the value below 0.67 spend less. In the case of firm size, the average value was 7.04 which means company above 7.04 are considered as large firms. The probability values of the test of normality for all the variables (retoe, retoa, lencost and fsize) are lesser than 5%. This means that all the variables satisfied normality.

**Correlation Analysis**

In examining the association among the variables, the study employed the Pearson correlation coefficient (correlation matrix) and the results are presented in the table below.

**Correlate retoe retoa fsize lencost (obs=232) table 2**

	retoe	retoa	fsize	lencost	
retoe	1.0000				
retoa	0.6644	1.0000			
fsize	0.2889	0.3980	0.0803	1.0000	
lencost	0.0013	0.1110	-0.0145	-0.0554	1.0000

**Source:** Researcher Computation (2022)

In the results of table 2 above, we observed that environmental cost has a fairly negative relationship with firm size (-0.055) and weakly associated with return on equity and return on asset. The financial performance measures were positively and moderately associated with firm size and environmental cost. The above results also show that, there exists a positive and weak association between firm size and return on equity (FSIZE/RETOE=0.29). In the case of firm size and return on asset, there exist a positive and weak relationship between them (FSIZE/RETOA=0.40). Similarly, from the table above we can see some of the relationships that exist.

## Unit Root Test

### Panel unit root test for Dependent and Independent Variables

Stationarity of the series was checked through panel unit root test. Panel unit root test are not similar to unit root test. Panel unit root tests are simply multiple series unit root tests that have been applied to panel data structure (where the presence of cross sections generates 'multiple series' out of a single series. To check for common unit root process, we use the Levin, Lin and Chu Panel unit root test and, for individual unit root process, we use Lm, Pesaran & Shin W-Stat panel unit root test. At 5% level of significant, the null hypothesis will be rejected if p-value is less than 0.05 and conclude that the series is stationary. The test where conducted based on the following null unit root hypotheses;

Levin Lin & Chu Test: Assumes common unit root process, Lm, Pesaran & Shin W- Stat test: Assumes individual unit root process,

The summary result of the panel unit root test of the variables are presented in the table below and the detailed result are displayed.

**Result of Panel Unit Root Tests for the Variables table 3**

Variables	Levin Li and Chu		Lm, Pesaran & Shin W-Stat	
	Statistic	P-value	Statistic	P-value
ROE	-4.4312	0.0000	-0.9281	0.1767
ROA	-7.6420	0.0000	-1.2555	0.1047
FSIZE	4.3926	0.0000	-3.6555	0.0001
LENCOST	-10.8023	0.0000	1.1523	0.8754

In case of the common unit root test, the result shows that at 5% level of significance, reject the null hypothesis common unit root for ROE, ROA, FSIZE, and LENCOST with their Levin Lin & Chu statistic as -4.4312, -7.6420, -3.9010, -14.3926 and -10.8023 respectively, and their p-values are all above 0.000. Since their p-values are less than 0.05, it's concluded that the test is significant and the series are all stationary at level. In case of the individual unit root test, the result shows the test statistic as -0.9281, -1.2555, -3.6555, and -1.1523. with associated p-values of (0.1767, 0.1047, 0.0001, and 0.8754) for ROE, ROA, so we reject the null hypothesis and concluded that the individual process of the variables are stationary. Generally, we concluded that the variables ROE, ROA, FSIZE, and LENCOST have no unit root, which implies that the series are stationary.

### Co-integration Test

The panel unit root test suggested that the series were stationary. This implies that the series are integrated of order zero and can be tested for co-integration with Engle- Granger co-integration test. The test aimed at determining whether a long term relation exist between the series stating the null hypothesis that there is no co-integrating relation, and if the hypothesis cannot be accepted, we test the hypothesis that there is at most one co-integrating equation.

### Co-integration Test for the Series RETOE FSIZE and LENCOST

#### Cointegration Test - Engle-Granger table 4

Specification: RETOE FSIZE LENCOST C

Cointegrating equation deterministic: C

Null hypothesis: Series are not cointegrated

Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag=11)

	Value	Prob.*
Engle-Granger tau-statistic	-34.32629	0.0001
Engle-Granger z-statistic	-73.98792	0.0000

\*MacKinnon (1996) p-values.

From table 4 above the Engle-Granger tau statistic and z-statistic are recorded as -34.3263 and -73.9879 with p-values of 0.0001 and 0.0000 respectively. The Engle-Granger co-integration test is significant since the respective p-value is less than 0.05. At 5% level of significance the Engle-Granger co-integration test rejects the null hypothesis which means there is a long run relationship exists within the variables. Therefore, we conclude that in model 1, the variables are co-integrated.

**Co-integration Test for the Series RETOA FSIZE and LENCOST****Co-integration Test - Engle-Granger table 5**

Specification: RETOE FSIZE LENCOST C

Co-integrating equation deterministic: C

Null hypothesis: Series are not co-integrated

Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag=11)

	Value	Prob.*
Engle-Granger tau-statistic	-4.795542	0.0324
Engle-Granger z-statistic	-35.19619	0.0289

\*MacKinnon (1996) p-values.

From table 5 above, the Engle-Granger tau statistic and z-statistic are recorded as -4.7955 and -35.1962 with p-values of 0.0324 and 0.0289 respectively. The Engle-Granger co-integration test is significant since the respective p-value is less than 0.05. At 5% level of significance the Engle-Granger co-integration test rejects the null hypothesis which means there is a long run relationship exists within the variables. Therefore we conclude that in model 2, the variables are co-integrated.

**Test of Constant Variance (Heteroskedasticity)**

The tests for constant variance were conducted via the White's Heteroskedasticity test.

White's test is a test of the null hypothesis of no heteroskedasticity against heteroskedasticity of some unknown general form. The Obs\*R-squared statistic is White's test statistic, computed as the number of observations times the centered from the test regression. The null hypothesis is rejected if the test is significant at 5% level. The tests for the models are detailed below.

**Test of Constant Variance for Model 1****Model 1 Heteroskedasticity Test: White table 6**

F-statistic	2.216527	Prob. F	0.0276
Obs*R-squared	19.29310	Prob. Chi-Square(10)	0.0367
Scaled explained SS	156.1859	Prob. Chi-Square(10)	0.0000

The test statistic, Obs\*R-squared is given as 19.2931 with p-value of 0.0367. The p-value (0.0367) is less than 0.05, so the test is significant and the null hypothesis is rejected. We concluded that assumption heteroskedasticity is not violated.

**Test of Constant Variance for Model 2****Heteroskedasticity Test: White table 7**

F-statistic	2.407504	Prob. F	0.0169
Obs*R-squared	20.50102	Prob. Chi-Square(10)	0.0249
Scaled explained SS	1614.203	Prob. Chi-Square(10)	0.0000

The test statistic, Obs\*R-squared is given as 20.5010 with p-value of 0.0249. The p-value (0.0249) is less than 0.05, so the test is significant and the null hypothesis is rejected. It's concluded that assumption heteroskedasticity is not violated.

**Test of Hypotheses****Hypothesis 1**

H<sub>0</sub>: Environmental cost has no significant impact on return on equity

H<sub>1</sub>: Environmental cost has significant impact on return on equity

The model is given as;

Model 1;  $ROE_{it} = \beta_0 + \beta_1 LENCOST_{it} + \beta_2 FSIZE_{it} + \mu$

The F-statistic of 3.11 and p-value of 0.0466, which is less than 0.05, indicates that the test is statistically

significant at 5% level. The null hypothesis is rejected and concluded that environmental cost has a significant effect on return on equity.

**Hypothesis 2**

H<sub>0</sub>: Environmental cost has no significant impact on return on asset

H<sub>1</sub>: Environmental cost has significant impact on return on asset.

The model is given as;

Model 2;  $ROA_{it} = \beta_0 + \beta_1 LENCOST_{it} + \beta_2 FSIZE_{it} + \mu$

The F-statistic of 15.17 and p-value of 0.0000, which is less than 0.05, indicates that the test is statistically significant at 5% level. The null hypothesis is rejected and concluded that environmental cost has a significant effect on return on asset.

### Conclusion

In line with the main objective of the study which is to examine the imperative of environmental cost on equity and asset of quoted manufacturing firms in Nigeria. Two hypotheses are tested to ascertain the effect of environmental cost on equity and asset of quoted manufacturing firms in Nigeria.

The first specific objective was to examine the impact of environmental cost on return on equity of quoted manufacturing firms in Nigeria and to achieve this, hypothesis was tested and the results reviewed that environmental cost has a significant impact on return on equity of quoted manufacturing firms in Nigeria. This finding is in line with that of Galani (2014).

In line with the second specific objective which was to examine the impact of environmental cost on return on asset of quoted manufacturing firms in Nigeria, hypothesis tested reveals that environmental cost has a significant impact on return on asset of quoted manufacturing firms in Nigeria. This result is in line with that of Uwalomwa (2014) who conducted a study on Corporate Environmental Reporting Practices using a comparative approach of Nigerian and South African Firms. He investigated the extent and nature of corporate environmental reporting practice among listed firms in Nigeria and South Africa and found out that there is a significant positive relationship between the operating performance, size of firms and the level of corporate environmental cost among selected firms in Nigeria. This is also supported by the findings of Tapang, Bassej and Bessong (2012).

In accordance with this study's findings, it is recommended that: Firms in Nigeria should invest reasonable amount on environmental issues and report same in their financial reports for the various stakeholders to see. This will create a good relationship with the host community which will enable growth in production and increase in turnover. The Financial Reporting Council of Nigeria (FRC) and others alike should make environmental cost reporting a mandatory report as this can help compel the firms to engage in environmental conservation activities that will mitigate the adverse effect of their business activities on the host communities. As a result will lead to a conducive business operating environment and increase in profitability. Besides shareholders interest in the report on earnings per share. There are other stakeholders who are interested

in other information in the financial reports like the efforts of the firms in conserving the environment in line with global best practices. The disclosure of such environmental cost will attract diverse investors and this will bring about increase in the earnings report of the firms.

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