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ANALYSIS OF CORPORATE ENVIRONMENTAL COST DISCLOSURE ON PROFITABILITY OF LISTED MANUFACTURING FIRMS IN NIGERIA

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Abstract

The study examines the impact of corporate environment cost disclosure on profitability of listed manufacturing firms in Nigeria. Specifically, the study analyses the relationship between the level of corporate environmental cost disclosure and profitability proxy by net profit margin of cement and paint manufacturing firms in Nigeria. The study reveals positive and significant influence of corporate environmental cost disclosure proxies by (environmental research and development cost, social cost, environmental compliance cost, environmental pollution detection cost and environmental operating cost) on net profit margin. The study concludes that corporate environmental cost disclosure has a significant effect on profitability of manufacturing firms in Nigeria. Thus the study recommends that policies that would sustain reporting on environmental issues such as mandatory disclosures on environmental matters should be encouraged because they had been shown to be beneficial to the health and survival of the firms.

Keywords:
Environmental Compliance Cost, Environmental Operating Cost, Environmental Pollution Detection Cost, Social Cost, Profitability.

Introduction

Environmental costs play an important role in environmental accounting and reporting. According to (Beredugo, 2014), humans have undoubtedly altered their environment, and they have typically done it on a grander scale than all other animals. It has been found that human efforts to satisfy these many human desires have a number of detrimental effects on the environment, including rural-urban migration, deforestation, desertification, and the emission of effluent and other wastes. Environmental cost disclosure practice assists the accountability of the enterprises, increases environmental transparency and determines the relationship of the enterprises with the society in general, and especially with environmental pressure group. Also environmental cost disclosure helps to determine the monetary aspect of the relationship and changes between firms' performance and economic factors (Özkol, 2018). Another significant function of environmental cost disclosure is decreasing and preventing the environmental accounting, determining the means for increasing environmental quality and drawing the attention to environmental costs. Environmental sustainability is the capacity of the environment to give comparable support and services to future generations. Environmental expenditure can take on a variety of shapes, and this may be due to the unique operating characteristics of certain businesses.

Environmental costs disclosure is traditionally viewed as end-of-pipe treatment or pollution prevention activities by businesses (Filbeck & Gorman, 2014). Companies spend billions of dollars each year on the technologies required to install mandatory technologies or comply with environmental regulations when

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applying for environmental licenses (Portney, 2020). The ultimate purpose of such a large outlay is to boost profitability and increase earnings and wealth of shareholders (Konar & Cohen, 2011). Investors are primarily concerned with a company's financial status, and pay little or no attention to its corporate environmental performance (Deswanto & Siregar, 2018). According to Murray (2020), it is counter intuitive to believe that businesses would invest in social and environmental benefits if they knew they would not be repaid. The study on social and environmental cost disclosures has been met with a variety of metrics and classifications, depending on the extent of the researcher's investigation. Although studies on social and environmental cost disclosures have been conducted, particularly in industrialized countries where there have been several debates.

More so, the issue of environmental cost disclosure includes the lack of environmental costs reporting by manufacturing firms in Nigeria. This lack of reporting hampers the ability of stakeholders to evaluate the sustainability practices of these firms and make informed decisions (Akinboye, 2019; Ololube, 2019). Failing to disclose expenses related to pollution control, waste management, and resource depletion makes it difficult to accurately assess the true environmental impact of these companies (Ugwu & Orji, 2019). The absence of a comprehensive regulatory framework in Nigeria that mandates environmental costs reporting is attributed to the lack of disclosure (Idowu & Louche, 2019). As a result, reporting practices are inconsistent and voluntary, leading to limited comparability and accountability (Bosire, 2020). The problem also highlights that many manufacturing firms in Nigeria are not aware of or do not possess the capacity to measure and report environmental costs accurately (Mukhtar, 2018). This lack of knowledge and capacity further impedes the integration of environmental considerations into decision-making processes (Adeyemo *et al*., 2019).

Furthermore, the absence of reliable and standardized environmental cost disclosures has negative implications for investors. It hinders their ability to assess risks associated with environmental impact and make informed investment decisions (Arroyo *et al.,* 2021). Consequently, funding opportunities for sustainable businesses become limited (Epstein *et al.,* 2020). Moreover, the lack of transparency in environmental costs reporting undermines Nigeria's progress towards achieving sustainable development goals. It obstructs the monitoring of sustainable practices within the manufacturing sector, which are crucial for promoting sustainable development in the country (Olawuyi & Olatunji, 2020).

Furthermore, an upward trend in corporate environmental cost disclosure is being noticed worldwide, as companies in developed countries such as France, Finland, Germany, Japan, Netherland, New Zealand, Norway, Sweden, UK and USA have started disclosing corporate environmental information voluntarily with the costs associated with it. However, the same cannot be said of developing countries since the extent of environmental cost disclosure has remained predominantly very low (Belal & Owan, 2020). Nevertheless, given the heightened interest and increasing demand from stakeholders for corporate accountability, this study further provides an avenue for manufacturing firms to identify, and disclose various aggregations of environmental cost disclosure that have often been hidden and presented as overhead to management under the traditional financial reporting system of accounting. This invariably will allow the company to identify opportunities for environmental cost disclosure. it's give and insight to firms on how to satisfy the growing demands and continuous yearning for the voluntary disclosure of corporate environmental costs information in their annual reports. This in the long run, helps to visualize a cosimage of the company as having a moral obligation to account for its environmental cost disclosure activities.

Furthermore, the lack of transparency and accountability in environmental costs reporting obstructs the integration of sustainable practices into decision-making processes. As a result, manufacturing firms may not adequately allocate resources for pollution control measures, waste management systems, or sustainable resource consumption, potentially affecting their profitability (Ugwu, & Orji 2019). Additionally, the absence of reliable environmental cost disclosures impedes investors' ability to assess the financial risks and returns of investing in sustainable businesses. The lack of clear information on the financial impact of environmental practices may discourage potential investors, limiting funding opportunities for manufacturing firms striving for sustainability. Therefore, there is a pressing need to investigate the effect of environmental cost disclosure on the profitability of manufacturing firms in Nigeria. Understanding the financial implications of

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environmental practices and developing a comprehensive framework for reporting environmental costs will enable stakeholders to make informed decisions, promote sustainable development, and foster financial growth within the manufacturing sector.

Literature Review

Environmental Costs

Environmental costs are the costs required taken to manage the environmental impacts of an enterprises activity in an environmentally responsible manner. Uwuigbe and Olayinka (2021) defined environmental costs as the costs borne by society, an organization, or an individual as a result of activities of entities that have an impact on environmental quality. The implication is that the previously observed mismatch between firm's wellness and the environmental repercussions of their commercial operations will no longer exist in the future. These are the costs of complying with or preventing violations of environmental laws, regulations and company policies. However, the actual environmental costs for businesses are much broader and include the costs of resources, both directly related to production and those related to general business operations, cost of waste treatment disposal, and environmental costs. It includes the costs of bad reputation.

Environmental costs can be divided into "private cost" that directly affect a company's profits and "social cost" that are costs to individuals, society and the environment for which companies are not responsible. Private costs can be further classified as: Conventional cost, potentially hidden cost, incidental cost, and image and relationship cost. Traditional costs are raw materials, operating resources, capital goods, and the cost of using operating resources are typically considered in costing and capital budgeting. However, the environmental portion of this cost is generally not considered environmental cost disclosure. It is important to factor these costs into your business decisions as to whether they are considered environmental costs. Similarly, potential hidden costs are environmental costs that may be hidden from managers because of their rarity and/or inclusion in corporate overhead accounts (EPA, 1995). The different types of environmental costs that can remain hidden from managers include initial environmental costs, regulatory and voluntary environmental costs, and post-environmental costs. In addition, there is a possible cost are cost that may or may not occur at some point in the future. Examples include cleanup and compensation cost for future unintended releases of pollutants to the environment (such as oil spills), and fines and penalties for future rule violations. This cost may not currently need to be recognized for other purposes and, therefore, may not be properly considered in management's internal accounting systems and forward-looking decisions.

Environmental Cost Disclosure

There are two types of factors that influence environmental costs disclosure: internal and external influences (Giannarakis 2019; Welbeck, 2017). On the external side, the media and government play a role in environmental cost disclosure sharing. The government can impose rules and sanctions on businesses, forcing them to report the environmental impact of their operations to inform users. Companies' environmental cost disclosure is influenced by external variables such as regulatory pressure, competitive mechanisms (Giannarakiset, 2019), and pressure from non-governmental organizations (Welbeck, 2017). The consequences of environmental management's organizational ability from an enterprise's concrete characteristics such as institutional structure and learning capacity influence the disclosure of environmental cost, according to Malafronte, (2016). External determinant of environmental costs, according to include the media and government.

Environmental Compliance Costs and Profitability

Environmental compliance costs refer to the expenses incurred by a company to comply with environmental regulations and standards. These costs can include fees for permits, equipment upgrades, pollution control measures, and fines for non-compliance .Net profit margin, on the other hand, is a financial ratio that measures the percentage of revenue that remains after deducting all expenses, including taxes and interest. It is calculated by dividing net profit by revenue (Passetti, 2018). Environmental compliance cost can have a

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significant impact on a company's net profit margin. Higher compliance costs can reduce the net profit margin, as the company has to spend more money on compliance measures, which decreases the amount of profit left over after all expenses are accounted for. However, companies that prioritize environmental compliance can benefit in the long term by improving their reputation, reducing their environmental impact, and avoiding potential fines and legal liabilities. This can lead to increased customer loyalty and attract socially responsible investors, ultimately improving their financial performance and net profit margin over time. Therefore, while environmental compliance costs may initially reduce a company's net profit margin, investing in sustainability provides long-term benefits for both the environment and the company's bottom line (Xi *et al.,* 2019).

Environmental cost disclosure refers to the practice of companies disclosing the environmental costs associated with their business activities. This can include the costs of carbon emissions, water usage, and waste disposal, among others. Net profit margin, on the other hand, is a financial ratio that measures a company's profitability. It is calculated by dividing the net profit (total revenue minus total expenses) by the total revenue. There is a growing trend among investors and consumers to prioritize companies that disclose their environmental costs and take steps to minimize their environmental impact. Companies that engage in sustainable practices and reduce their environmental costs can improve their reputation and attract socially responsible investors and customers (Brooks & Oikonomou, 2018).

While there may be upfront costs associated with implementing sustainable practices, in the long run, these practices can lead to costs savings and increased profitability. For example, reducing energy usage can lower a company's utility bills, while reducing waste can decrease the costs of waste disposal. Therefore, by disclosing their environmental costs and implementing sustainable practices, companies can not only improve their environmental impact but also potentially increase their net profit margin. Several studies have examined the relationship between environmental cost disclosure and profitability. However, there is a limited study on net profit margin particularly among manufacturing companies in Nigeria. Thus this study hypothesized as follows:

H_o: Corporate environmental disclosure has no significant effect on profitability of manufacturing firms in Nigeria

Theoretical Review

Theory of sustainable development: Sustainable development involves addressing current needs without jeopardizing future generations' ability to meet their own (Giangrande , 2019). That is, natural resource protection and environmental sustainability development. This concept can be traced back to the 1962 book Silent Spring. Sustainable development is a scientific and economic growth concept in which development is intimately linked to the environment (Giangrande *et al.,* 2019; Elmagrhi *et al.,* 2019). China has proposed a sustainable development strategy to assure the synchronization of environmental and economic development, highlighting can be used in the environment to create material prosperity within the acceptable limits (Pearce, 2013).

According to the Brantland report, "Our Common Future," sustainable development is defined as "development that meets the needs of the present without relying on future generations' abilities to meet their needs. According to this definition, sustainable development is a process in which the people of a country satisfy their own wants and enhance their standard of living without using resources that belong to future generations or waste future wealth to meet their immediate needs. The sustainability idea underpins sustainable development and the ability of a system to function indefinitely is referred to as its sustainability. It is a state in which the attractiveness does not deteriorate with time, and the resources of human systems, other biological species, and ecosystems require in order to function are not depleted. actions do not deteriorate. Sustainable development is also a collection of acts motivated by the sustainability ideology. In this style of development, plans, policies, programs, and actions are examined, monitored, and altered on a regular basis in accordance with sustainable principles. These protections are implemented carefully and consciously for the benefit of the community and to conserve natural resources. Furthermore, on the basis of

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the obtained findings, decisions are made whose positive consequences will outweigh their negative consequences. In sustainable development, human life-supporting systems, as well as other organisms and ecosystems, are protected and supported, and a balance is maintained between developmental requirements and environmental norms.

Empirical Review

Environmental cost disclosure has been a prominent topic among academics due to its importance and the role anticipated of accountants in ensuring corporations' accountability for the impact of their actions on the environment. For instance, Goyal (2013) noted that there are notable differences in the application of environmental cost disclosure in annual reports of firms, owing to the fact that there is currently no specific Institutional accounting social dealing with environmental accounting. More so, according to Eze *et al.* (2016), adoption of uniform standards for the purpose of control and measurement to use product designs that produce less waste and emissions over the course of their lives. Likewise, Ifureze *et al.,* (2017) used three indicators to investigate the impact of environmental expenses on profitability; community development cost, waste management cost, and employee health and safety cost. Sustainable business practices were found to be significantly related to profitability. Similarly, environmental responsibility and corporate performance were investigated by Ngwakwe (2018). The study discovered that 'responsible' firms' sustainable practices are highly related to company performance. Furthermore, Arong *et al.* (2014) conducted a study in Nigeria on environmental costs management and oil sector profitability. The study discovered that there is a substantial association between environmental costs management and oil sector profitability in Nigeria.

In the vain, Oba & Fodio (2012b) posited that companies that disclosed their environmental costs had higher profitability than those that did not disclose. The authors suggest that this may be because companies that disclose their environmental costs are more likely to be implementing sustainable practices that lead to costs savings and increased profitability. Another study conducted by Ohidoa *et al.* (2016) observed a positive relationship between environmental performance and financial performance, including net profit margin. More so, a study by Ojo (2016) also found that environmental disclosure was positively associated with financial performance, including net profit margin.

Methodology

The study employed ex-post-facto research design using a sample of 2 manufacturing firms (Dangote Cements and Berger Paints). Secondary data needed for the study were harvested from the content analysis disclosure index and corporate annual reports of the sampled manufacturing firms listed on the Nigerian Exchange group for the period of eleven years from 2010-2021 financial years. Panel least square regression as well as Generalized Method of Moments (GMM) estimator were employed in the study.

Table 1. Measurement of Variables

Variables	Denotation	Measurements
Profitability	NPM	Net Profit/Total Revenue
Environmental Research and Development Cost	ERDC	Disclosure 1, Non-disclosure 0
Environmental Compliance Cost	ECCD	Disclosure 1, Non-Compliance 0
Social Cost	SCD	Disclosure 1, Non- disclosure 0
Environmental Operating Cost	EOCD	Disclosure 1, Non-disclosure 0
Environmental Pollution Detection Cost	EPCD	Disclosure 1, Non-disclosure 0

Source: Author's Compilation (2024)

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Model Specifications

A functional equation that relates with environmental cost disclosure and Fi*nancial Reporting Quality was adapted from the study of Ullah (2013) and Ndukwe & John (2015) specified as follows:

Model

NPM = f (ERDCD, ECCD, SCD , EOCD , EPCD) eqn$_1$

Where

NPM = Profitability (Net Profit Margin)

ERDCD = Environmental Research and Development Cost Disclosure

ECCD = Environmental Compliance Cost Disclosure

SCD= Social cost Disclosure

EOCD = Environmental Operating cost Disclosure

EPCD = Environmental Pollution Cost Disclosure

$NPM_{it}=\alpha_1 + \alpha_2 ERDCD_{it} + \alpha_3 ECCD_{it} + \alpha_4 SCD_{it} + \alpha_5 EOCD_{it} + + \alpha_6 EPCD_{it} + \varepsilon_{it}$ .eqn$_2$

Where α_1 is the constant term,α_2 ,…… α_8 are the slopes of the regression estimated and ε_{it}captured the stochastic error term and their a priori expectation were specified as follows: α_2; α_3; α_3; α_4; α_5; α_5; α_6; α > 0

Results and Discussions

Descriptive Statistics

Table 2 shows the descriptive statistics for both dependent and independent variables. The mean value for the environmental research and development costs (ERDCD) was 0.181373, with a standard deviation of 0.385642. ERDCD has a p-value of 0.001 which implies that the mean value of ERDCD is quite low it is however statically significant at 0.05 levels. Social Cost Disclosure (SCD) has a mean value of 30.48802 with standard deviation of 115.0286. The maximum and minimum values of SC are 1555.99 and 0.5 respectively. Social costs have a p-value of 0.003 which indicate the statically significant level at 5%. Environment Compliance Cost Disclosure (ECCD) has a mean value of 0.23658 with a Standard deviation of 0.543782. The p-value for the ECCD is 0.006 which implies that ECCD is statistically significant at 5% level. Environmental Operating Cost shows a mean value of 0.288373 with a standard deviation of 0.342562. The maximum and minimum values for EOCD are 54.78 and S0.67. The p-value of Environmental Operating Cost Disclosure (EOCD) is 0.041 meaning that it is statically significant at 5% level. Environmental Pollution Cost (EPCD) has a mean value of 8.724722 with standard deviation of 0.465782. The maximum and minimum values for EPDC are 2.787 and 0.214 respectively. The p-value for the EPC is 0.021 which indicate the significant level at 5%. Net Profit Margin (NPM) also has a mean value of 0.176452 with standard deviation of 0.506541. The maximum and minimum values for NPM are 2.632 and 0.034 respectively. The p-value for NPM is 0.023 indicating significant level at 5%.

Table 2. Descriptive Statistics

	Mean	Max	Min	Std. Dev.	Prob.
ERDD	0.181373	1	0	0.385642	0.001
SCD	30.48802	1555.99	0.5	115.0286	0.003
ECCD	0.23658	4.55	5.65	0.543782	0.006
EOCD	0.288373	54.78	0.67	0.342562	0.041
EPDCD	8.724722	2.787	0.214	0.465782	0.021
NPM	0.176452	2.632	0.034	0.506541	0.023

Source: Researcher's computation (2024)

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Correlation Analysis

Table 3 shows the correlation between variables to test multi-collinearity problem. It was found that there are low correlation between variables as all coefficient values being less than 0.8 and this is a clear indication of non-existence of multi-collinearity problem as stated by Shittu and Amao (2022).

Table 3. Correlation Matrix

Variables	NPM	ERDCD	SCD	ECCD	EOCD	EPDCD
NPM	1					
ERDCD **p-value**	0.0735 0.0000	1				
SCD	0.6752	0.4536	1			
p-value	0.0000	(0.003)				
ECCD **p-value**	(0.0546) (0.0233)	(0.2345) (0.0287)	(0.5463) (0.0000)	1		
EOCD **p-value**	0.7689 (0.0423)	0.4376 (0.0323)	0.4235 (0.0651)	0.3425 (0.0623)	1	
EPCD **p-value**	0.4357 (0.0324)	0.3456 (0.0756)	0.5278 (0.0112)	0.5453 (0.0000)	0.0232 (0.0432)	1

Note: the null hypothesis are tested at the 0.05 significance level (*, $p < 0.05$ and **, $p < 0.01$).
Source: Researcher's computation (2024)

Table 4. Environmental Cost Disclosure (ECD) and Profitability Results

		FE Estimates	RE estimates	GMM Estimates
C		0.41592* (0.07241) {0.000}	0.4566* (0.4536) {0.0023}	-0.80587* (0.09233) {0.000}
ECD	+	0.02516* (0.0112) {0.0051}	0.0030 (0.0107) {0.7772}	-0.2769* (0.0416) {0.000}
NPM	+	0.0075* (0.0071) {0.0001}	-0.0039 (0.0177) {0.8263}	0.0758* (0.0187) {0.0001}
Model Parameters R2		0.6424	0.0734	0.358
Adjusted R2		0.6110	0.066	0.112
F-statistic		26.862	9.895	
Prob(F-stat)		0.000	0.000	0.000
Durbin-Watson		2.1	1.97	2.071
Model Diagnostics Hausman	0.006			
Ramsey Reset test		0.410		
Period Hetero.Test		0.81		
Cross-section Hetero.Test		0.431		
Pesaran CD for serial correlation		0.571		
Instrument Rank				8
j-statistics				3.0344
Prob-j-stat				0.2193
AR(1)				0.0023
AR(2)				0.274

Note: the null hypothesis are tested at the 0.05 significance level (*, $p < 0.05$ and **, $p < 0.01$).
Source: Researcher's computation (2024)

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Effect of Environmental Cost Disclosure (ECD) and Profitability

The results of Fixed Effect estimates show that R^2 is 0.64 but with a degree of freedom adjusted the R^2 is 0.61%. The F-stat of 26.862 (p-value = 0.00) is significant at 5% and suggests that the hypothesis of a significant linear relationship between the dependent and independent are significant. The analysis of coefficients reveals environmental disclosure has a positive (2.1591) effect on Net profit margin and is statistically significant at 5% (p = 0.000). Furthermore, the Arrelano and Bond estimation results reveal that the coefficient for ECD is higher (17.5513) and has a significant effect (p=0.008) on NPM at 5%. Consequently, based on the Arrelano and Bond GMM estimation. Therefore, the null hypothesis that environmental cost disclosures have no significant effect on NPM is rejected.

Conclusion and Recommendation

The study analyse the corporate environmental cost disclosure among listed manufacturing firms in Nigeria. The study focuses on two manufacturing firms in Nigeria, namely Dangote Cement and Berger Paints. The study concludes that there was a significant relationship between environmental cost disclosure and net profit margin of selected companies. Thus the study recommends that policies that would sustain reporting on environmental issues such as mandatory disclosures on environmental matters should be encouraged because they had been shown to be beneficial to the health and survival of the firms. Furthermore, manufacturing firms should disclose environmental costs in their annual reports. By disclosing their environmental costs manufacturing companies in Nigeria will increase their transparency, improve their reputation with stakeholders, and potentially attract socially responsible investors. More so, environmental cost disclosure can help companies to identify areas where they can reduce costs and increase efficiency.

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