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ENVIRONMENTAL REPORTING AND MARKET VALUE OF LISTED NON-FINANCIAL FIRMS IN NIGERIA

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Abstract

The study investigates the relationship between environmental reporting and market value of listed non-financial firms in Nigeria. Secondary data gathered from the annual reports of the sample of fifty (50), out of the population of one hundred and twenty-eight (128) listed non-financial firms, selected through purposive sampling techniques, were analysed using content and multiple regression analyses. The study finds that there is a significant positive relationship between environmental reporting and firm market value. It is recommended that listed non-financial firms should consciously make positive contributions to their operating environment in the areas of employee health and benefit cost, community social responsibility cost, and environmental research and development as they report the same in their annual environmental reporting for the purpose of enhancing their market values.

Keywords: Environmental Reporting, Environmental degradation, Firm Market Value, Firm value drives

JEL Code: M410, M480

1. Introduction

Environmental reporting is regarded as disclosure of an entity's environmental related information concerning environmental risks, costs, liabilities, policies, targets, strategies, or environmental performance to stakeholders that are interested in the information for making economic decisions relating to the entity. Environmental reporting is used interchangeably as environmental accounting. It can also be regarded as an environmental management strategy to communicate with those who have an interest in such information (Deegan, 2002).

Meanwhile, firm value is the worth of a company in financial term. It is the price that an informed and willing buyer would be ready to pay in an arm length transaction. Market value is one of the indicators of measuring performance of corporate managers. It is attained through value addition to corporate shareholders. Value creation is crucial to business sustainability, value-based studies assess the relationship between the share price of firms and the financial information they report (Qiu *et al.*, 2016). It is deduced here that the significant the relationship, the more useful the financial figures released by companies are to the investors' who are important group of users of financial reporting information. This normally focuses on the net income and book value of shareholder's fund as they are important drivers in company valuation (Feltham & Olson, 1995; Ohlson, 1999, 2000). The potential of environmental value creation stems from the significance of intangibles in the equity holder value model. The intangibles include intellectual, human, social, and natural capital of a company which add value but are not conventionally reported in the Statement of Financial

Position. The objectivity of the accounting process matters a lot in respect of the value that can be realized.

Environmental matters are increasingly dominating intellectual and policy deliberations debates because it is no longer news that the chemical, biological, and physical integrity of the planet is being compromised daily through air pollution, destruction of the ozone layer through the release of chlorofluorocarbons, global warming produced by greenhouse gases and, threats to biodiversity especially deforestation of tropical rainforests. These all occur on specific national territories, but they are gradually depleting 'common heritage of humanity. Therefore, the productive activities of the firms should not be averse to their operational environments.

Logically, this obligation becomes necessary as firms remain the primary source of environmental worry. A lot of these firms are financially sound, institutionally strong and have the technological know-how to solve these problems, nevertheless the feedback is somewhat passive (Shrivastava, 1995). The effort in the direction of environmental disclosure has consequently become apparently clear both in the developing and developed countries because of stakeholders' demand for information concerning firm social and environmental obligation (Elkington, 1997; Guthrie *et al.*, 2006, Christensen, 2016). Williams (1999) opined that stakeholders are increasingly demanding for disclosure of firms' environmental reports because of their worries about the degree of liabilities and costs attached with environmental matters and, its influence on investment decisions and stakeholder groups' activities. Problem thus arises in a situation where inadequate socio-environmental facts is reported to allow stakeholders make relevant decisions that can enhance long term value creation. Hence, on any occasion that disclosure provided is inadequate compare with users' requirements, this lead to expectation gap.

While considerable research efforts have been deployed on environmental accounting studies in advanced countries (Tsang, 1998; Deegan *et al.*, 2002 and Antonites & DeVilliers, 2003), opposite is the case in developing nations including Nigeria in which many firms operating in the local community release gaseous wastes, liquid and solid wastes directly to the environment with no suitable treatment that meets the fundamental international standards (Omofonmwan & Osa-Edoh, 2008; Okeagu *et al.*, 2008). Even though there are studies in Nigeria on the relationship between environmental reporting and firm's value (Akinlo & Iredele, 2014; Emeka-Nwokeji & Osisioma, 2019), efforts have not been made to distinctly examine how components of environmental related information directly affect firm's value which is the main thrust of this study. Hence, the study objective is to contribute to the extant literature on environmental reporting by examining the relationship between the components of environmental related information and market values of listed non-financial firms.

The paper is structured as follows: background to the study was stated in section 1 while section two dealt with the literature review. Methodology of the study was explained in section three while analysis and discussions of findings were set out in section four. Finally, conclusion of the study and recommendations were stated in section five.

2. Literature Review

The conceptual, theoretical, and empirical reviews are carried out under this section to x-ray previous studies on the topic and bring to fore the gap in literature that the study will fill.

1.1 Concept of Environmental Reporting

Environmental accounting is a field of study that ascertains resource use, measures, and communicates costs of national economic or a company's impact on the environment. It is the term commonly applied to describe the disclosure by an entity of environmentally

related data with respect to environmental risks, environmental impact, strategies, policies, targets, costs, liabilities, or environmental functioning to those who are concerned with such information as an aid to economic decision making through annual report and accounts; corporate environmental performance report; site-centred environmental report; and some other instruments. Environmental costs are costs associated with the creation, detection, remediation, and prevention of environmental degradation.

2.2 Environmental Sensitivity

Previous research showed that the nature of firm's activities could be a possible determinant of environmental reporting practices. The more the environmental sensitivity of a sector, the more the stakeholders are anxious on environmental disclosure, hence the more crucial the environmental disclosure decision. Dierkes and Preston (1977) contended that firms that have direct operation with high effect on the environment, in the like of extractive industries could disclose more environmental information than other industries. Furthermore, industry types may affect political propensity and dispense pressures to firms to disclose to avoid criticism and pressures from some environmental and social groups (Patten, 1991).

2.3 Value Drivers

Value drivers are the fundamental and obstinate characteristics of a firm, which influence the value. Genuine value drivers are essential, because they stand for a significant, intrinsic feature of a firm and they are essential because they will have a long-term effect on the value notwithstanding the market fluctuations. Intangible value drivers having linkages with environmental frameworks have more influence on shareholder value creation.

Value drivers could be traced directly to line items in the annual reports and indirectly to intangibles with operating and financial results. An integrated attention on the crucial value drivers for a firm may be based on priority on sensitivity to shareholder value creation and the management ability of the value driver in the planning horizon on the basis of strategy, culture, competitive position, capabilities or other factors within the same firm across many business units or geographic and indeed diverse overtime for certain entities. Once the key value drivers were identified and prioritized, it is crucial to the appropriate measure of success, which are external determinants of improved shareholder value and internal measure of value aligned in a meaningful way to allow management focus and make good business decision.

2.4 Theoretical Framework

Stakeholder theory forms the bedrock of the study. Stakeholder theory explains that the corporations 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 which will in turn enhance firm value. Stakeholders as any group or individual who can affect or is affected by the achievement of the organization's objectives. It is an individual or group with an interest in the success of a company in delivering intended results and maintaining the viability of the company's product and/or service.

The study adopts stakeholder theory as the most useful framework in explaining environmental reporting because it concerns with the way a corporation manages its stakeholders. All the listed non-financial firms cannot operate without the approval of stakeholders in their operating environments otherwise, their productive activities will be hindered and going concern threaten. Hence, Stakeholder theory helps in understanding the ways corporate managers manage their stakeholders through disclosures of environmental information.

2.5 Empirical Review

Iatridis (2013) assessed the association between environmental disclosure and environmental performance and examined the financial attributes of companies with different environmental disclosure scores in Malaysia using correlational studies. The study suggested that firm's size, capital need, capital expenditure and financial viability have positive relationship with quality of environmental reporting. Manager would be more motivated to produce high quality environmental disclosure in a larger company which has more regulations to follow. In addition, the study found that companies that disseminated a quality environmental disclosure generally have strong corporate governance and met with less obstacles in capital markets. Interestingly, majority of the companies are audited by big 4 audit firm or cross-listed on foreign stock exchange. The study, although linked environmental reporting with environmental performance, yet failed to examine the components of environmental reporting in relation to environmental performance.

Similarly, Ioannou and Serafeim (2014) assessed the extent of disclosure of environmental information among countries with severe environmental challenges and found that firms in China and South Africa which are the countries that are facing severe environmental challenges had significantly increased the disclosure of environmental information while firms in Denmark and Malaysia which are perceived as countries with relatively less severe environmental challenges countries exhibited no increase in disseminating of environmental information.

Furthermore, He and Loftus (2014) evaluated the environmental disclosure practices of firms engaged in environmentally sensitive industries by examining their association with environmental performance using a disclosure index based on the global reporting. The study found that more favourable environmental performance provides a higher level of environmental disclosure and include a greater proportion of hard disclosure items. However, the overall level of disclosure is lower than that observed in developed countries. The study also found that companies with more favourable environmental behaviour include a significant portion of hard disclosure items which are more objective and verifiable.

In addition, Hassel *et al.* (2015) evaluated how information on environmental issues is affecting the market value of quoted companies in Swedish. Market value was stated as a function of accounting earnings, book value of share, and environmental and social performance using residual income valuation model. Environmental and social performance is used as a proxy for further information on value relevant and presumed that environmental and social reporting has value relevance, because it could influence the future returns of quoted firms. The study found a negative relationship between environmental reporting and market value by supporting the cost-centred school rather than value-creation school. The study however failed to examine the components of environmental reporting to really determine which of the components motivates negative relationship.

In Nigeria, Akinlo and Iredele (2014) examined the impact of environmental disclosures on value of fifty quoted firms in Nigeria for the period 2003-2011. The aggregate and individual impact of Corporate Environmental Disclosure (CED) was regressed on Market Value using Tobin's Q. Their empirical analysis revealed that CED has a significant positive impact on Market Value when considered in aggregate. The study failed to examine the components of the environmental reporting while regressing environmental information against the market value.

Likewise, Emeka-Nwokeji and Osisioma (2019) investigated how overall sustainability reporting affect firms' value using multiple regression analysis technique, and found that overall sustainability disclosures have significant positive relationship with firm's market value. Also, when the sustainability disclosures are taken individually, the

environmental information disclosures dimension have a significant positive effect on firm's value. However, the study failed to examine the different components of environmental information (Employee health and benefit cost, Community social responsibility cost, Environmental research and development disclosure, and Environmental law compliance and pollution abatement disclosure) to bring to fore specific environmental information that affect firm's value. Hence this study to fill the gap and contribute to extant literature in emerging economy context.

3. Methodology

The study used *Expost facto* research design and content analysis. The population for the study comprised of one hundred and twenty-eight non-financial companies quoted on the Nigerian Stock Exchange (NSE) as at December 2018. Purposive sampling technique was employed to select a sample of fifty (50) firms for analysis to specifically select firms in oil and gas, and manufacturing sectors whose production activities directly affect the environment. Companies, whose financial reports were not up to date or were delisted before December 2018 were also excluded. As a result, the final sample set consists of fifty firms over a period of nine years, 2010 – 2018.

Secondary data were sourced from the audited Annual Reports and Corporate websites of the selected Companies quoted on the Nigerian Stock Exchange (NSE) for a period of nine (9) years, 2010 to 2018. Data gathered for the purpose of achieving the objectives of the study were analysed using descriptive statistics and regression analysis.

3.1 Environmental Disclosure Checklist

The overall environmental reporting checklist which measures extent of environmental reporting consist of forty-three (43) information items which were categorized into six (6) groups based on relevant variables with reference to Global Reporting Initiative and Global Environmental Management Initiative.

3.2 The Scoring Method for Reporting Indexes

The common approach to measure the extent of corporate disclosure of information is adopted by (Hodgdon *et al.*, 2008; Street & Gray, 2001). It is also known as dummy' approach. This index is considered as unweight since all items are treated in the same way. Unweighted approach is built on the assumption that each item is of equal important; it moderates bias and offers a neutral examination of items. When information is reported, a score of '1' is allotted but if not a score of '0' is allotted. The score for each item is the proportion of actual reporting divided by applicable reporting.

$$DIS = \frac{T = \sum_{i=1}^n di}{M = \sum_{i=1}^m dt} \text{----- (3.1)}$$

Where:

- DIS = Disclosure score for each company (0<RESj<1).
- T = Sum of items disclosed (d□) by firm k.
- M = Highest number of items that should be reported by firm k.

A score of '0' was allocated where no information was provided. This was calculated for every firm by dividing the number of scores attained by the total expected scores. Two likely answers: "Yes" or "No" were provided on the checklist. Every reporting item was allotted a value of '1' where it was reported (Yes) and '0' where it was not reported. The composite disclosure index was the sum of actual reporting as a proportion of total expected disclosure.

3.3 Model for Environmental Reporting and Firm Value.

This study applied the modified residual income valuation model presented in Ohlson (1995) by expressing the market value of equity as a function of the book value of equity and environmental reporting (GRI). The last variable (GRI) is a proxy for other value-relevant information (Hassel *et al.*, 2015). The motivation for including the GRI variable in the valuation model is in line with the academic literature and GRI developers. Environmental reporting is considered to have the potential to provide critical information for investors. This information completes financial reports often with forward-looking information that can enhance users' understanding of such key value drivers as human capital formation, corporate governance, the management of environmental risks and liabilities, as well as the capacity to innovate.

An equity statement that has no income other than net income from the income statement is a clean surplus accounting statement (Penman, 2001). Based on a clean surplus accounting relation, it is possible to express a firm's security price as a function of the firm's book value of equity plus GRI as follows (Dechow *et al.*, 1996):

$$P_t = b_t + a_1 x_t^c + a_2 v_t \quad \text{-----} \quad (3.2)$$

This study is interested in examining how a firm's environmental reporting affects market value. Dechow *et al.*, (1996) estimated the other information variable through markets' consensus forecast. Since the study is interested in only one part of the other information, that is, environmental reporting, the study used the environmental reporting variable GRI as a proxy for the other information variable, V_t (Hassel *et al.*, 2015). This allows the study to examine the effect of environmental reporting on market value.

In Equation (3.3), the study express market value of equity MV as a function of earnings-based value EBV and environmental reporting (GRI).

$$\ln MV_{it} = \beta_0 + \beta_1 \ln EBV_{it} + \beta_2 GRI_{it} + U_{it} \quad \text{-----} \quad (3.3)$$

A natural logarithm format was applied to avoid the possibility of extreme values contaminating the results. This regression model recognizes the theoretical relationship between market value (MV) and earnings-based value (EBV). The model allows the study of whether environmental reporting has incremental value-relevance. Based on the nature of this study the variables to capture environmental reporting are employee health and benefit cost; community social sustainability cost; environmental research and development disclosure; and environmental law compliance and pollution abatement disclosure.

Hence, the specific model for this study is as follows:

$$\ln MV_{it} = \beta_0 + \beta_1 EHB_{it} + \beta_2 CSC_{it} + \beta_3 ERD_{it} + \beta_4 EVD_{it} + U_{it} \quad \text{-----} \quad (3.4)$$

Where:

- MV = Market value which is Market price per share multiply by number of ordinary shares (issued and fully paid).
- EHB = Employee health and benefit cost. This is measured by disclosure of expenditure on Employees' health and benefit.
- CSC = Community social responsibility cost, measured by disclosure on Community social responsibility.
- ERD = Environmental research and development disclosure, measured by disclosure on environmental research and development.

- EVD = Environmental law compliance and pollution abatement disclosure, measured by disclosure on compliance with environmental law and pollution abatement.
- U = Error term.
- t = Time period.
- i = Cross section dimension and ranges from 1 to N
- β_0 = Intercept
- $\beta_1-\beta_4$ = Coefficient for independent variables.

A priori expectation: $\beta_1 - \beta_4 > 0$.

4. Analysis of Data and Discussion of Findings

The secondary data that were gathered were firstly subjected to diagnostic tests of unit-root estimations, to assess the stationarity of the variables before they are regressed. The results revealed that all the panel data are stationary.

4.1 Descriptive Statistics for the Effect of Environmental Reporting on the Firm Market Value

Table 1 summarizes the basic statistics features of the data under consideration. The reported statistics consist of the standard deviation, mean, maximum and minimum. These provide historical background for the behaviour of the data. A consideration of the descriptive statistics for the dependent and independent variables discloses several issues. There seem to be evidence of significant variation as shown by the huge difference between the minimum and maximum values of some of the variables under consideration. The mean market value (MV) across the firms is $\square 498$ with a standard deviation of $\square 115$. The minimum market value figure stays around $\square 7.6M$ while the maximum value is $\square 1.080B$. Employee health benefit and cost (EHB) was averaged to be $\square 259B$ while its deviation from the mean $\square 495B$

The average amount spent on community social responsibility (CSC) is $\square 9.18B$ with its dispersion standing at $\square 46.8B$. The environmental research and development disclosure (ERD) also have its mean value to be $\square 28.712M$ while standard deviation and maximum value are in the tune of $\square 24.918M$ and $\square 125M$ respectively. Lastly, the mean EVD is $\square 31,480M$ with standard deviation equal to $\square 30.086M$. The maximum value generated from the variable is $\square 161M$.

Table 1: Summary Statistics for the Effect of Environmental Reporting on the Value of Listed Firms

Variable	Obs.	Mean	Std. Dev.	Min	Max
CSC	450	9180000000	46800000000	10000	420000000000
EHB	450	259000000000	495000000000	13600000000	3900000000000
ERD	450	28712.96	24918.11	1100	125000
MV	450	498	115	7.6	1080
EVD	450	31480.7	30086.47	1200	161000

4.2 Correlation Matrix for the Effect of Environmental Reporting on the Value of Listed Firms

The result of correlation analysis on the relationship among the variables is reported in Table 2. It shows the correlation matrix, a measure of the degree of association and direction of relationship among the variables. It also shows the degree of linearity among the variables. Here, the relationship between MV and each of the other variables shows a positive and low value except with EHB which is moderately high. This means market value moves in the same direction with its explanatory variables. Overall, there is moderate strength of association among the variable as reflected by moderately low correlation coefficients. This further implies there is no multi collinearity in the data set or among the variables.

Table 2: Correlation Matrix for the Effect of Environmental Reporting on the Value of Listed Firms

	MV	EHB	CSC	ERD	EVD
MV	1				
EHB	0.736	1			
CSC	0.038	0.107	1		
ERD	0.379	0.523	0.194	1	
EVD	0.399	0.590	0.224	0.627	1

4.3 Results of Regression for the Effect of Environmental Reporting on the Firm Market Value of Listed Firms

Panel data regression analysis was used to evaluate the influence of explanatory variable on dependent variable. The equation in model 3.3 employs market value as dependent variable while environmental reporting was employed as independent variable. Table 3 show the result of the pooled OLS model. It is observed that 62% of the variation in market value is explained by the independent variables. F-statistic value (122.04) is significant at 5% affirming the overall significance of the model and that of all the explanatory variables at the same time. It is observed that employee health cost and benefit (EHB) across the panels is positively and significantly ($t=14.35$; $p<5\%$) influencing their market value. Hence, 1% increase (decrease) in EHB will create a corresponding 93% increase (decrease) in market value. Community social responsibility cost (CSC) moves in positive direction with market value and have a significant relationship ($t=3.97$; $p<5\%$) with MV. It is observed that 1% change in CSC will cause a change of about 17% change in market value. This may be because community service ordinarily is a function of market value.

While environmental research and development disclosure (ERD) positively and significantly ($t=2.18$; $p<5\%$) affect market value of all firms, 1% change in ERD will create 46% change in market value across all firms. Lastly, environmental law compliance and pollution abatement disclosure (EVD) shares a negative but insignificant relationship ($t=-1.5$; $p>5\%$) with market value. And it is observed that a percentage increase in EVD leaves market value decrease by 31%. Therefore, the adjusted R-square (0.6182), F-statistics (122.02) and p-value (0.0000) confirmed the overall significant of the result.

Table 3: Pool OLS for the Effect of Environmental Reporting on the Value of Listed Firms

Lmv	Coeff	std.Err	T	p>t
EHB	0.9314	0.0649	14.35	0.000***
CSC	0.1759	0.0443	3.97	0.000***
ERD	0.4685	0.2146	2.18	0.03**
EVD	-0.3175	0.2118	-1.5	0.135
_cons	-0.4496	1.1484	-0.39	0.696
No of obs	440			
Adj R ²	0.6182			
F-stat	122.02			
prob	0.0000			

Note: *** and ** indicate 1% and 5% significance levels respectively.

4.4 Discussion of Findings

The a priori expectation is no significant relationship between environmental reporting and firm's value. However, from the regression results in Table 3 the coefficient of the EHB as expected has a positive and significant relationship with firm's value. This shows that employee health and benefit cost could determine the firm value. This is consistent with finding of Turban and Greening (1997), Inchausti (1997), and Tsang (1998). Furthermore, it provides support for stakeholder theory that the firms going concern need the backing of the stakeholders and their approval is required and the operations must be adjusted to gain such approval.

The coefficient of the CSC as expected has a positive and significant relationship with firm's value. This shows that community social responsibility cost could determine the firm value. This finding as reflected invariably supports the proposition of Armaya'U (2010), Uwugbe and Egbide (2012) which states that the community social responsibility cost of firms positively affects the firm value. Nonetheless, it contradicts the findings provided by Teoh *et al.*, (1999) and Tsang (1998). The coefficient of the ERD as expected has a positive and significant relationship with MV. This shows that ERD could determine the firm value. This finding as reflected contradicts the findings provided by McWilliams and Siegel (2000) which states that the ERD of firms negatively affect the firm value.

The coefficient of the EVD has a non-significant negative relationship with firm's value. This shows that environmental law compliance and pollution abatement disclosure could not be used in explaining firm value. This finding as reflected is in line with the findings of De Villiers which states that there is negative association between Environmental law compliance and pollution abatement disclosure and value of companies. However, it is contrary to the findings provided by Lars and Henrik (2005), and Iqbal *et al.* (2013).

5. Conclusion and Recommendations

The results showed that employee health and benefit cost, community social responsibility cost, and environmental research and development disclosure were the three major variables that had positive influence on value of listed firms in Nigeria. The study concludes that these components of environmental reporting could be used in determining firm's value while Environmental law compliance and pollution abatement disclosure is negatively related to market value of non-financial firms.

It is recommended that listed non-financial firms should consciously make positive contributions to their operating environment in the areas of employee health and benefit cost, community social responsibility cost, and environmental research and development as they report the same in their annual reports for the purpose of enhancing their market values.

Also, both Securities and Exchange Commission (SEC) and Nigeria Stock Exchange (NSE) should mandate companies to establish environmental, social, health and safety committee for the purpose of reporting on environmental, social, health and safety issues in the corporate annual report, as this will enhance socio-environmental accounting and general corporate social responsibility.

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