

The Impact of Environmental Cost on Corporate Performance: A Study of Oil Companies in Niger Delta States of Nigeria

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Abstract: The study examined the impact of environmental cost on corporate performance in 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. Therefore, the researchers recommended that the management of oil companies in the Niger Delta States of Nigeria 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.

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1. Introduction

The quest for sustainability has caused an emergence of many global firms enunciating various norms that guide human interaction with the environment. The increase in global environmental awareness and the campaign for sustainable economic development is redirecting the attention of firms towards environmental costs. Environmental costs have been expanded to account for 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. Many companies are increasingly interested in capturing benefits associated with environmental sustainability and stewardship

Environmental Management Systems (EMS) have emerged as a means to systematically apply business management to environmental costs to enhance a firm's long-run financial performance by developing processes and products that simultaneously improve competitive and environmental performance (Stead and Stead, 1992). However within the developing nations, the understanding is somewhat different mainly because of weak government regulations and lack of organized pressure groups and consumer awareness to influence corporate behavior. Environmental expenditures in terms of effective organizational cost reduction are a highly viable approach toward managerial justification of Environmental Management System (EMS) expenditures.

Thus, environmental cost provides a framework to environmental responsibility and corporate financial performance. The extent to which the environmental costs influence corporate performance is determined by some variables, such as community development costs, waste management costs and employee health and safety costs. The impact of these variables on corporate performance, represented here by return on total assets, would be examined in this seminar paper.

1.1 Statement of the Problem

No study on the environmental cost and corporate financial performance nexus in Nigeria has included the effect of community development, waste management, and employee health and safety as well as fines, penalties and compensations, including litigation costs as being control variables in the investigation of the relationship between environmental costs and corporate performance of oil companies.

This study therefore fills the research gap and thus constitutes an extension on exploratory examination to determine the impact of environmental cost on corporate performance of oil companies in Niger Delta States of Nigeria.

1.2 Objectives of the Study

The broad objective of the study is to investigate the impact of environmental cost on corporate performance of oil companies in the Niger Delta States of Nigeria. Specifically, the objectives are to establish that:

1. Community development costs and corporate performance are significantly related;
2. Waste management costs and corporate performance are significantly related;
3. Employee Health and Safety costs and corporate performance are significantly related.

1.3 Hypothesis

HO₁: There is no significant relationship between Community Development Costs (CDC) and Corporate Performance.

HO₂: There is no significant relationship between Waste Management Costs (WMC) and Corporate Performance.

HO₃: There is no significant relationship between Employee Health and Safety Costs (EHSC) and Corporate Performance.

1.4 Scope of the Study

This study contributes to existing literature by examining the relationship between environmental costs and corporate performance of oil companies in the Niger Delta States of Nigeria; hence, addressing the Niger Delta states specific dimension to the region's youth restiveness and

sustainable business practices. The study is a peculiar deviation from previous studies in scope (covering only the environmental expenditure influence on the corporate performance of oil companies in the Niger Delta States of Nigeria over the time period from the year 2001 to 2011).

In addition, the effects of different measures of environmental costs on corporate performance were examined, thereby providing a comprehensive empirical investigation of the environmental costs and corporate financial performance of nexus oil companies in the Niger Delta States.

The study also made conscious efforts to address the endogeneity of environmental issue and provide a framework for examining the possibility of the impact of environmental costs on corporate performance of companies in the oil sector.

2. Review of Related Literature

2.1 Theoretical Framework

ElKington (1997) reiterated via his triple bottom line approach theory, that capitalism must satisfy legitimate demands for economic performance. With this, ElKington (1997) echoes Adam Smith's theory of the firm - that the firm has one and only one goal – to satisfy the desires of shareholders by making profits. However, profit may not be attainable if the environment in which the business operates is neglected. A corporation which accommodates the triple bottom line approach (social, economical and environmental performance) is contributing to sustainable development.

Hart (1997) added that the achievement of sustainability would require a blending of product stewardship, green technology and pollution prevention.

2.2 Environmental Theories

Technocentric theory as pioneered by O'Riordan (1997); emphasizes the need for environmentally friendly products and clean technology.

The ecocentric theory by Pepper (1986) and Dobson (1990), stresses the need for business to produce a balanced report that includes reporting the impact of business activities on the environment. A useful report would include how the corporation has managed its immediate and remote environment, but many businesses lack the strategy for proper environmental management.

2.3 Review of Empirical Studies

Holm and Rikhardsson (2008) 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.* (2005) 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.

Cochran and Wood (1984) follow a similar line of research by investigating the relationship existing between corporate social responsibility and firm performance.

Lankoski (2000) in his doctoral dissertation analyzed, at firm level, the relationship, between environmental performance and economic performance. His data shows a correlation between environmental performance and economic performance.

According to Hillman and Keim (2001) not all social investment may yield return in a financial form but may boost corporate competitive strategy and be of strategic value.

The International Federation of Accountants (IFAC: 2005), observes that environmental pressure is forcing many organizations to look for new, creative and cost-efficient ways to manage and minimize environmental impacts. Organizations have come to recognize the potential monetary rewards of improved environmental performance. They have discovered that enhancing efficiency in the use of energy, water and other raw materials brings not only environmental improvements but also significant monetary savings as the costs of materials purchase and waste treatment decrease accordingly.

According to Bose (2006), since oil and gas resources are natural assets and non-renewable and it is generally accepted that the environmental impact from the sector is significant, so economic valuation, accounting and reporting of these resources and their environmental impacts are very important to ensure sustainable development. With the growing concern for sustainable development, there has come a demand for environmental and resource accounting. Environmental accounting may play an important role to provide the needed data on environment to different users. Environmental reporting will ensure the “Corporate Environmental Stewardship” of organizational activities.

Bala and Yusuf (2003) posited that current practices demonstrate that no track for environmental costs was available as it was changed randomly. Therefore, there is a need for proper charging and allocation. Distinguishing between environmental costs and other costs will lead to a proper cost allocation of these costs and thus more precise and will help to develop sustainability indicators.

The US Environmental Protection Agency – EPA (1995) and Hamid (2002) took the stance that accounting should be responsible for measuring, evaluating and disclosure of environmental performance in financial statements or in its attachments. Measuring environmental performance depends on accounting systems but also needs more data other than the conventional accounting data, such as pollution ratio. Monetizing environmental issues may not be totally accurate, but economists and accountants have to give best estimates according to the current level of knowledge and techniques used.

According to Pinckard and Wendy (2000), in the course of meeting the relevant accounting standard requirements, some additional disclosures in the notes to the financial statements may be required. For example, the industry in which the reporting entity operates and the associated environmental issues, the accounting treatment adopted for environmental costs, fines and penalties which have been incurred under environmental legislation, and environmental restoration liabilities, including measurement uncertainties, nature and timing.

2.4 Environmental Regulation in Nigeria and Firm

Environmental regulation in Nigeria existed as window dressing before 1998. However, this changed as a result of an attempt in 1997 by a foreign company, acting through an agent, to dump toxic waste in the Niger Delta region. This event shocked the Federal Government of Nigeria and highlighted the porous nature of environmental regulation in the country. This gave rise to the promulgation of Decree No. 42 of 1988 by the former Federal Military Government of Nigeria.

This decree made it a criminal offence for anyone to carry or dump any harmful waste within the entire land mass and waters of the Federal Republic of Nigeria.

The episode gave rise to the need for an agency to oversee environmental protection; hence decree No. 58 of 1988 gave birth to the Federal Environmental Protection Agency (FEPA). The Decree was later amended in 1992 by Decree No. 59 of 1992, granting FEPA the responsibility for protection of the environment, biological diversity, conservation and environmental technology and research. It was this decree that created the first standards of environmental regulation in Nigeria.

The standards include: Water quality, effluent limitation, air quality, atmospheric protection, ozone layer protection, noise levels and the control of hazardous substances. These represent the efforts made by successive administrations to ameliorate the environmental problems of the country. However, on May 29 1999 the civilian government under President Olusegun Obasanjo, added an impetus to the struggle against environmental menaces by according the environment a greater priority. To this effect, it created, for the first time in the history of Nigeria, the Ministry of Environment in June 1999. The former regulatory agency, FEPA, was absorbed by the Ministry of Environment which took over all its function.

3. Methodology

3.1 The Variables and Description of Data

This study used annual data for the period 2001-2011, collected from the Nigerian Stock Exchange (annual reports and accounts of the companies under study). Twelve oil companies operating in the Niger Delta States of Nigeria were selected by the researcher based on availability of annual report and accounts in the Nigerian Stock Exchange (NSE): namely, Total Nigeria Plc, Forte Oil Plc, Externa Oil and Gas Plc, MRS Oil Nigeria Plc, Conoil Plc, Mobil Oil Nigeria Plc, Oando Plc, Texaco Nigeria Plc, African Petroleum Plc, Beco Petroluem Products Plc, Agip Nigeria Plc and Unipetrol Nigeria Plc. However, these 12 oil companies qualified for inclusion in the analysis because these companies had financial data on the independent variables: Community Development Cost, Waste management Cost and Employee Health and Safety Cost. For the purpose of this study, Corporate Performance is measured by return on total assets (ROTA), which is defined as profits after tax divided by total assets.

Two multiple regression tests were conducted. In the first one, the dependent variable is ROTA while the independent variables are Community Development Cost (CDC), Waste Management Cost (WMC) and Employee Health and Safety Cost (EHSC). In the second multiple regression analysis the dependent variable is replaced with Fines, Penalties and Compensations including litigation costs.

3.2 Model Specification

We develop a regression model of the following form to capture the interrelationships between sustainable business practices and corporate performance.

$$\text{ROTA} = f(\text{CDC} + \text{WMC} + \text{EHSC}) \quad (1)$$

Hence the regression model is given as:

$$Y = f(b_0 + b_1x_1 + b_2x_2 + b_3x_3 + U) \quad (2)$$

Where $Y = \text{ROTA}$

$$X_1 = \text{CDC}$$

$$X_2 = \text{WMC}$$

$X_3 = \text{EHSC}$

$b =$ parameter to be estimated

$U =$ error term

ROTA = dependent variable; an index of performance.

3.3 Evaluation Technique

The Multiple Regression Technique was used for the analysis. The technique possesses the unique property of Best Linear Unbiased Estimator (BLUE) when compared to other estimating techniques. The Multiple Regression Estimator also possesses the desirable qualities of un-biasness, consistency and efficiency. The statistics tested for include regression equation for the variables, coefficient of determination (R^2), t-test, f-test and Durbin Watson (DW) statistics. The Statistics Package for Social Sciences (SPSS) 19 for windows is the statistical computer software used to run the analysis.

Where:

Coefficient of Determination (R^2) = Test = measures the explanatory power of the independent variables on the dependent variable.

Student T-Test: Measures the individual significance of the estimated independent variables.

F-test: Test for the overall statistical significance of the models. It is used to generalize the hypothesis.

Durbin Watson (DW) Statistics test. This statistics tests for the auto correlation in the regression equation.

3.4 Data Presentation and Analysis

Table 1. Average sustainability indicators and Return on Total Assets (ROTA) in 12 selected oil companies for the period 2001-2011

Dependent Variable (performance)		Independent Variables (Environmental Cost)		
Year	ROTA (%)	CDC ₦ millions	WMC ₦ millions	EHSC ₦ millions
2001	8	10	9	8
2002	7	13	12	11
2003	6	14	15	16
2004	5	18	19	18
2005	14	20	23	22
2006	22	21	22	23
2007	26	22	24	22
2008	28	23	25	23
2009	29	24	23	24
2010	30	25	24	24
2011	31	26	25	25

Source: Annual Report and Accounts for the various oil companies for the year 2001-2011, collected from NSE

Interpretation: The table 1 depicts the average sustainability indicators in millions of Nigerian Naira (₦): Community Development Cost (CDC), Waste Management Cost (WMC) and

Employee Health and Safety Cost (EHSC). These indicators are matched against the movement in return on total assets (ROTA) expressed in the percentages in the 12 oil companies selected for the study for the years 2001-2011.

Table 2. Average sustainability indicators and amount of fines, penalties and compensations in the 12 selected oil companies for the period 2001-2011

Year	FPC ₦' m	CDC ₦ millions	WMC ₦ millions	EHSC ₦ millions
2001	6	10	9	8
2002	5	13	12	11
2003	4	14	15	16
2004	3	18	19	18
2005	2.5	20	23	22
2006	2	21	22	23
2007	1.5	22	24	22
2008	1	23	25	23
2009	0.5	24	23	23
2010	0.3	26	24	24
2011	0.2	25	25	25

Source: Annual Report and Accounts for the various oil companies for the year 2001-2011, collected from NSE.

Interpretation: The table 2 shows the average sustainability indicators in millions of Nigerian Naira (₦m): Community Development Cost (CDC), Waste Management Cost (WMC) and Employee Health and Safety Cost (EHSC). These indicators are matched against the amounts paid for Fines, Penalties and Compensations (FPC).

Table 3. Regression of Return on Total Assets (ROTA) on CDC, WMC and EHSC in 12 selected oil companies (2001-2011)

Model	Unstandardized coefficients		Standardized coefficients	T	sig
	B	Standard Error	Beta		
1 constant	8.189	.722		11.341	.000
CDC	-.552	.303	-1.438	-1.824	.118
WMC	-.045	.404	-1.142	-.112	.915
EHSC	.775	.222	2.472	3.492	.013

Dependent variable: ROTA

F-Value = 87.604

F-Probability = 0.000

R² = 96

Adj R² = 96%

DW = 1.633

Source: Windows SPSS 19.

Table 4. Registration of Fines, Penalties and Compensations (FPC) on CDC, WMC and EHSC in 12 selected oil companies (2001-2011)

Model	Unstandardized coefficients		Standardized coefficients	t	sig
	B	Standard Error	Beta		
1 constant	15.936	1.595		9.89	.000
CDC	+680	.669	-2.569	-2.552	.045
WMC	.252	.892	.463	.283	.787
EHSC	.654	.490	1.220	1.334	.231

F-Value = 92.16

F-Probability = 0.000

$R^2 = .983$

Adj $R^2 = 98.3\%$

DW = 1.763

Source: Windows SPSS 19.

3.5 Interpretation of Results

3.5.1 On Multiple Regression 1 (Table 3)

- The coefficient of determination – R^2 shows that explanatory variables explained approximately 96% of the variation in corporate performance
- Community Development Cost has statistically significant and negative relationship with corporate performance. A unit increase in Community Development cost leads to .552 units decrease in profit of the firm.
- Waste Management Cost has statistically significant and negative relationship with corporate performance. A unit increase in Waste management Cost leads to .045 decrease in profit of the firm.
- Employee Health and Safety Cost: Employee Health and Safety Cost has a positive and significant relationship with corporate performance

Regression results revealed that investment in social and environmental responsibilities such as Employee Health and safety related costs is likely to improve return on total assets of the environmentally cost conscious firms.

These results agree with prior theoretical postulations as increase in environmental cost on employee health and safety is expected to improve corporate performance. But investment in Community Development and Waste Management costs are negatively related to return on total assets. These results do not conform to a prior expectation because theoretically, CDC and WMC are expected to be positively related to corporate performance through output in the long run.

3.5.2 On Multiple Regression 2 (Table 4)

The regression revealed that investment in Employee Health and Safety, and Waste Management are positively related to fines, penalties and compensation in the oil sector. These results conforms

with prior theoretical postulation as increase in environmental cost on EHSC and WMC is expected to decrease amount paid on Fines, penalties and compensation to the host community, and that any increase in fines, penalties and compensation paid to the community leads to decrease in investment on community development.

Therefore, with sustainable business practice, there was a decrease in the amount paid in fines and penalties including litigation costs to individuals and government for environmental offences and in compensation to the host community.

4. Conclusion

- This study examined the impact of Environmental Cost on corporate performance of oil companies in Niger Delta States of Nigeria
- Following a detailed time series analysis, the findings revealed that Environmental Cost in the oil sector of Nigeria has significant impact on corporate performance
- Thus, it equally explains a very high degree of changes in corporate performance in terms of output, return on total assets, amount paid on fines, penalties and compensations to individuals, communities and government.
- Thus, Community Development Cost, Waste Management Cost and Employee Health and Safety Cost have significantly influenced corporate performance in the oil sector of Nigeria.

5. Recommendation

From the findings and conclusion of this study, the researchers recommended that:

- Management of oil companies should have positive disposition towards environmental cost friendly practices in order to restore and guarantee stable and sustainable operations in the oil sector of the Niger Delta States of Nigeria.
- Management of oil companies 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.

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