Environmental Liability and Financial Performance: A Study of Listed Oil and Gas Firms in Nigeria

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Abstract— Business activities and the environment are interrelated and the operations of oil and gas companies are carried out on the environment. These operations have been known to cause damages to the environment they operate and these damages have either managed or corrected. A lot of finance is spent by environmentally responsible companies, therefore, the study investigated the relationship between environmental liability and financial performance of listed oil and gas companies in Nigeria. The study made use of ex-post facto research design. The data used for this study was obtained from the annual reports published by the selected oil and gas firms listed on the Nigerian stock exchange. This research work adopted the panel least square (PLS) regression analysis with longitudinal (panel) regression using E-Views 10.0 statistical software. The findings of the study show that using the dimensions of Compensation obligation and profitability, and the dimensions of Remediation Obligation and Market Value, Environmental liability has a positive and significant relationship with financial performance of oil and gas companies in Nigeria. While environmental liability dimension of Remediation has no significant relationship with profitability of oil and gas firms in Nigeria, and Environmental liability dimension of Compensation Obligation has no significant relationship with market value of oil and gas companies in Nigeria. Based on this, this study recommends that oil and gas companies in Nigeria should spend significant amount on remediation to measure up to the damages caused to the environment and to individuals affected by the activities of their operation.

Indexed Terms—Environmental Liability, Environmental Remediation obligation, Environmental Compensation Obligation, Remediation Cost, Compensation Cost, Financial performance, Market Value, Profitability.

I. INTRODUCTION

A business cannot operate without its environment, it inter-relates with its environment and its survival depends on the environment which therefore causes it to impact externalities on its environment. The oil and gas industry depend solely on the environment, the crux of their existence is on their environment, therefore their action on the environment brings about the reaction called externalities. Externalities are either positive or the environment or community in which the company operates derive from the action of the company on the environment while Negative externalities are the harm caused to the environment or the community where the oil and gas company operates as a result of the activities of the company on the environment. Environmental harm can be caused in many ways e.g. loss of wetlands, pollution of rivers, and degradation of land and water resources, atmospheric pollution etc. and its negative impacts are in the form of climate change, global warming, and rising sea levels leaving behind adverse impacts. (Joshi, 2012).

Environmental liability regulation is one of the means of making polluters pay (and take action more generally) for preventing, remediating, or compensating environmental damage they cause. In economic terms, this means imposing internalisation of pollution externalities. Therefore, environmental liability regulation is an important instrument of the implementation of the Polluter Pays Principle (OECD, 2012). A well-designed environmental liability regime is also a significant deterrent against non-compliance with regulatory environmental requirements.

In Nigeria, in the 90s, environmental liability regulation was not futile and inoperative because it was overlooked by polluting oil and gas companies, and it was not actively enforced by the government.

Oil and gas companies polluted the environment they operated and destroyed the livestock relied upon by the community and farmers. communities reported that the companies did not own up fully to their liabilities and take responsibilities for their actions. If their first objective was to drill as much oil as they can in other to generate maximum profit and their second objective was to protect the environment from being damaged, it could have been acceptable at the time but these companies could care less about the environment and the people in it or the people whose source of livelihood depended on the polluted environment. Manby (1999) stated that the roles played by the oil multinationals in Nigeria received increasing attention as production had grown, and with it the repressive response of the Nigerian government. This caused to be formed groups of activists who condemned the actions of these oil and gas companies, they also condemned the silence of the government to these damages. Manby (1999) further stated that shell in particular, the largest producer in Nigeria, has faced a barrage of criticism over its activities in the country. In recent years there has been much greater awareness of environmental issues, and the role of companies in both damaging the environment and acting to protect the environment and create sustainable businesses. Education on ethics in different aspect of business and especially the environment has also increased the attention and responsibilities of oil and gas firms towards the environment. The sustainability of the natural environment and the central role of industry in its attainment continues to occupy the attention of academia (Taryn De Mendonca & Yan Zhou, 2020). Attitudes to CSR are evident in the ethical stance that many companies now take on these issues, and ethical stance in turn is affected by the corporate culture. Stock market values of listed companies now depend on the corporate social responsibility of the firm as opposed to how it was decades ago. Companies are now being held accountable for their use of the environment. Despite the trend in corporate social responsibility, and responsibillities to environmental liabilities, there are still organisations and countries that have not completely adapted responsibilities to environmental liability into their core system, and countries who have not enforced environmental liability rules.

Environmental liability is the term used for the process through which responsibility for the cost of damaging the environment is transferred back to those that cause the damage. (Asha, 2012). The united states department of defence (DOD), federal ministry of resources defines environmental liability for financial reporting purposes as "a future outflow or expenditure of resources that exist as of the financial reporting date for environmental clean-up, closure and/or disposal costs resulting from past transactions or events."

Financial performance is a measure of how much a company's ability to create profit, or create wealth for shareholders. Financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. A company's financial performance tells investors about its general well-being. It's a snapshot of its economic health and the job its management is doing, providing insight into the future: whether its operations and profits are on track to grow, and the outlook for its stock. (Kenton, 2021). The impact of environmental liability on financcial performance may be measured by non-financial metrics and may be positive or negative. For example, a company that takes responsibility for its damages and liabilities and reveals them in the financial statements viewed by investors may have a good reputation, and have good relations with the stakeholders and the environment in which it operates. A company's responsibility to its environmental liability does not only affect the company's stock in the stock market, it also protects its reputation before its customers. Porter and Van der Linde 1995; question conventional wisdom about the effect of environmental regulation on firm performance by stating that well-designed regulation could improve a firm's competitiveness. When a company has a good standing reputation before its customers, it enhances good customer relations and also increases profitability for the firm.

Empirically, several studies have worked on the environmental liability using different construct and practices. For instance; Joshi (2012) studied Corporate Environmental Responsibility: A Liability or Challenge, explained the concept of 'environmental liability' of corporations and its responsibility towards environmental protection. Jin and Xu (2020) examined the Impact of Environmental Investment on Financial Performance: Evidence from Chinese listed Companies. Ikponmwosa & Ogbeide (2021) studied

Environmental Responsibility And Firm Financial Performance: Evidence From International Oil Companies In Niger Delta**.** Le Ha Diem (2022) studied Corporate environmental responsibility and financial performance: The moderating role of ownership structure and listing status of Vietnam banks.

From the listed empirical literature, it is therefore evidenced that few studies have examined environmental liability and financial performance, and studies related to environmental liabilities have not used compensation obligation and remediation obligation as the construct of environmental liability such as Similarly, most relationship between environmental liability and performance has been a direct relationship. This study would investigate how environmental liability (in constructs of compensation obligation and remediation obligation can influence the financial performance of oil and gas companies in Nigeria.

- Statement of the Problem

The international capital market now encourages companies to be socially and environmentally responsible and to take responsibility for the impact caused by their business operations on the environment, Companies that are not environmentally responsible find their market share dropping as a result of bad reputation, so positive environmental responsibility and corporate social responsibility has become an incentive that boosts the value of companies who are environmentally responsible with their environmental liabilities in developed countries. Environmental liability causes resources to flow out of the firm, that is it may be in form of costs or commitment from the firm. Theses costs are incurred from complying to each national environmental liability rules. Such rules ensure restoration of site and compensation and remediation of environment used. Joshi (2012) opined that the principle under which environmental liability operates is sometimes called 'the polluter pays principle. This in one way or the puts constraints on the finance of the organization. The cost of taking responsibility for these liabilities caused by the company are obviously not small (minor),It could be large in financial terms and it would obviously reduce the profit of the company or the amount available to be distributed to shareholders. Environmental liability on the surface might be

thought to have a negative impact on firm performance in terms of financial performance as a result of all the financial commitment it takes out of the complying organization in complying with environmental liability rules, but based on studies done in recent times, the responsibility of the firm towards its environmental liabilities have been known to improve firm performance in many developed and developing counties.

The impact of owning up to environmental liability on performance of oil and gas companies in Nigeria as a result of their operations on the environment has not been ascertained. This study therefore aim to investigate the impact of Environmental liability on financial performance by studying selected oil and gas companies in Nigeria.

- Objectives of the Study

The aim of this study is to evaluate the relationship between environmental liability and financial Performance of selected oil and gas companies in Nigeria. Concisely, the objectives of the study are to:

1. Determine the relationship between remediation obligation and market value of listed oil and gas companies in Nigeria.
2. Ascertain the relationship between remediation obligation and profitability of listed oil and gas companies in Nigeria.
3. Investigate the relationship between compensation obligation and market value of listed oil and gas companies in Nigeria.
4. Ascertain the relationship between compensation obligation and profitability of listed oil and gas companies in Nigeria.

- Research Hypotheses

$H0_1$: There is no significant relationship between remediation obligation and market value of listed oil and gas companies in Nigeria.

$H0_2$. There is no significant relationship between remediation obligation and profitability of listed oil and gas companies in Nigeria.

$H0_3$: There is no significant relationship between compensation obligation and market value of listed oil and gas companies in Nigeria.

$H0_4$: There is no significant relationship between compensation obligation and profitability of listed oil and gas companies in Nigeria.

II. LITERATURE REVIEW

- Environmental Liability

Environmental liability arises from the obligation of the company to restore an environment when it has been used in their operation, or when a an asset has been installed by the company of which after the use of the asset, the environment where the operation took place is not the same which may cause the need for the environment to be restored to something close to how it was before the operation of the oil and gas company took place or before the asset was installed. Where environmental obligations have not been met, an environmental liability is then triggered, and environmental integrity is compromised (Tomsana et al, 2020).

Environmental issues go beyond national borders and vary in different countries. Different companies impose different environmental concerns that need to be recognized and whose liabilities need to be measured and reported. For example, Nigeria has oil spill as a major source of environmental problem which is a big issue in the country. Other nations like Germany and France whose major environmental degrading problem is energy. It creates environmental problems when fossils are burned to generate power and excess of it creates adverse effects on the health of people in the geographical location it is done. Phuong & Veronique (2019) argued that Extractive industries are at the centre of environmental and social issues because of their business operation which results in usage of dangerous chemicals and degradation of the environment. Therefore, the more extractive firms account for carbon emission, the more they should account for environmental provision. (Phuong, 2019). The primary instrument to control environmental harm often is ex ante regulation. However, given the limits of regulation, liability rules have to play an important complementary role (Faure, 2020). It may even seem as it companies are ready for the pollute and pay policy and consciously damage the environment with minding the ripple effects and the sources of livelihood that may be halted as a result of their operations, so far they can quickly jump into the compensation part, as it is one the environmental laws laid down by the government of most countries for environmentally degrading companies. Those liability rules are not used to prevent pollution or damage, but

serve as a "backstop" to provide access to compensation when damage occurs despite the implementation of treaty rules that aim at preventing damage. Such damage can occur by accident or non-accidentally. (Voigt, 2021).

The cost of environmental liabilities can be very high and it usually have major impact on the finances of environmentally polluting companies. Environmental liabilities are quite different from financial liabilities. In the case of default on financial liabilities, the creditors end up with the firm's assets and the debt is effectively discharged. Environmental liabilities do not simply disappear if the polluting firm goes into insolvency. On the contrary, they often remain with the associated asset and serve to impair any future cash flows if the firm's creditors takeover. Environmental liabilities may lead the creditor to have no desire to take over the residual assets of the firm, if they loom too large on the balance sheet. Ultimately, and in any case, all the costs associated with pollution are born by society at some level. (Schneider et al, 2014). There is also some evidence suggesting that environmental regulation affects productivity because it forces firms to commit resources to non-productive activities such as environmental auditing, waste treatment and litigation (Gray & Shadbegian, 1995, cited by Ramiahet al, 2013; Brouwers 2014). Faure, (2020) opined that Environmental liability serve two goals: it should provide incentives for the prevention of environmental harm to operators and it should lead to remediation of environmental harm, meaning compensation of victims and clean-up of the pollution caused.

III. REMEDIATION OBLIGATION

Environmental remediation liabilities arise when a reporting entity is, or was previously, associated with a site at which remedial actions must take place. PWC (2019) states that remediation obligations require businesses to manage the effects of pollution or industrial activities that pose a risk to human health and the environment. An entity may face remediation obligations for negative impacts on the environment for formerly owned or used sites, sites it never owned but contaminated, and sites it owns and has not contaminated.

PWC (2019) suggests that a liability for an environmental remediation obligation be recognized when the amount is probable and can be reasonably estimated.

Remediation obligation results into taking care of two damages which are:
1. Environmental Damages
2. Economic Damages.

According to the Enetjärn et al (2015), Environmental injuries, which are measured by ecologists and capture the biophysical changes: e.g., loss (or gain) of flora and fauna (biodiversity), habitats, or the contamination (or restoration) of water, soil or air. While Economic damages, which are measured by economists and capture how the environmental injury affects social well-being. Examples include: reduced enjoyment of habitat and species, increased cost of wastewater treatment, property damages from sea level rise or coastal erosion, flood damages from extreme weather events, reduced recreational opportunities, loss of food production, etc. Environmental damages therefore leads to Compensation Obligations.

IV. COMPENSATION OBLIGATIONS

Compensation obligations comprise compensation for damages that a firm caused to individuals or their property. Environmental compensation is a reasonable and natural expectation when a company's development negatively impacts areas of high environmental value. Compensation may also be achieved through other mechanisms like (first-party) insurance or compensation funds, whereas prevention may be the primary goal of public law-oriented instruments (such as conditions in permits) and market-based instruments (like emission trading and environmental taxation). Still, environmental liability may play at least an important complementary role in achieving the objectives of compensation and prevention (faure, 2020). Compensation helps polluters to consider the environmental consequences of their decisions. Enetjärn et al (2015) stated that if polluters faced incentives to consider these external (environmental) costs in their decision-making process, they would internalize them and thus consider the resulting environmental impact. The essence of compensation is to make amends for the loss suffered by the victims. In making these amends, the loss experienced by the victim must be recompensed otherwise the compensation cannot be said to be adequate or equivalent to the compulsory sacrifice.

Enetjärn et al (2015) analyzes compensation cost into four cost categories:

Transasction, Scaling, Investment, and Long-term Management.
1. Transaction cost: These are Costs incurred to reach an agreement with stakeholders. Such costs are spent on obtaining permission, reaching an agreement on compensations and any other plan.
2. Scaling Cost: These are costs incurred in order to determine the extent of environmental damage and to etermine the amount of compensation.
3. Investment Cost: These are costs that an entity plans to spend on compensation. Enetjärn et al. (2015) opined that they include labor and capital costs associated with landscape restoration and/or the purchase and protection of land.
4. Long-term management costs: These are costs incurred during the time the project is carried out to ensure compensation will be carried out. These costs include skilled labor (data collection) and site visits. It may also include establishment of a contingency fund that sets aside money up front to cover unforeseen costs that may arise at a future date, often ranging from 20 to 40% of total project costs (Jones 2011 ; Enetjärn et al 2015).

V. FINANCIAL PERFORMANCE

Performance of firms is of vital importance for investors, stakeholders and economy at large. For investors the return on their investments is highly valuable, and a well performing business can bring high and long-term returns for their investors.

Financial performance is a measure of how much a company's ability to create profit or create wealth for shareholders. Financial performance is the achievement of the company's financial performance for a certain period covering the collection and allocation of finance measured by capital adequacy, liquidity, solvency, efficiency, leverage and profitability. (Didin & Mochklas).

VIII. MEASURES OF FINANCIAL PERFORMANCE

i. Market Value

Market value is the term used to describe how much an asset or a company is worth on the financial market, according to market participants. It is commonly used to refer to the market capitalization of a company, which is calculated by multiplying the number of shares in circulation by the current market price. Market Value is a market oriented ratio measure of a company's strategic and financial performance. Market value is determined by the market's assessment of future earnings streams that company assets can generate while book value equals the amount paid for assets when acquired (House & Benefield, 1995; Majekobaje 2023). Although book values can be distorted due to arbitrary allocations and inadequate adjustments for the value of the dollar, company comparisons of market ratios are often valid since all companies in an industry can be assumed to be affected in the same way. Hax & Majluf (1984) states that market/book value is the best available measure of stockholder value creation.

Profitability

Profit is one of the core objectives of any firm for its long term reputation and survival. Profitability of a company is a picture that measures how well the company can generate profits from operational processes that have been implemented to ensure the continuity of the company in the future (Manoppo & Arie: 2016). Profitability is a firm's ability to generate profits from their activities. The primary objective of the firm is the maximization of profit. Profit is driven by revenues and costs. Thus a firm can maximize profit by maximizing revenues and/or minimizing costs. It reveals the firm's ability and capacity to generate earnings at a rate of sales, level of assets and stock of capital in a specific period of time (Margaretha and Supartika, 2016; Odusanya et al, 2018). It is the metric used to determine the scope of a company's profit in relation to the size of the business. Profitability is a measurement of efficiency and ultimately its success or failure. Profitability is usually seen as significant prerequisite for firm survival and long term achievement; In addition, the variable significantly affects the performance of the other financial goals of the company There are many ways to measure the profitability of company as well as industry, however, net income is the primary periodic performance index under accrual accounting. The net profit which is a company's total remaining earnings after all expenses have been deducted.

Environmental Liability and Market Value

The weight of literature on how the market reacts to environmental performance indicates that negative events such as pollution engender negative investors' reaction, while positive events such as reduction of emissions lead to positive reaction from the market (Wang, Zhang, Lu, Wang, Song, 2019). Barth and Nichols (1994) examined whether environmental liability estimates are associated with the share prices of polluting firms in the US, using seven proxies of environmental liabilities. Results of the study indicate that all the proxies are negatively associated with share price, indicating that the market negatively valued environmental liability estimates. Comier & Maanan (1997) noted that environmental liabilities implicit in pollution costs are negatively valued by the market. The literature on the value relevance of estimates of restoration costs is scanty. Generally, however, there is mixed evidence on how the market values environmental disclosures, environmental performance, environmental investments and estimates of environmental liabilities (Barth, & McNichols, 1994; Comier, & Megnan, 1997; Wang, Zhang, Lu,; Endrika 2016; Wang & Song, 2019).

Environmental Liability and Profitability

The increased emphasis of the need for companies to account for the environment, the effect of environmental obligations on firm's financial performance has emerged in recent times as a subject of interest. The dominance of economic rationality as fostered by the voluntary environmental disclosures has signaled firms' increased interest in cost-benefit perspective to environmental accounting. Profits increase when sales increase. When consumers of the company's produce perceive a company to environmentally destructive, it may dissuade them from purchasing the company's products or services, but when consumers perceive a company to be environmentally responsible, it may encourage to patronize the company more which thus leads to increase in sales, Increase in sales then generates more money for the company and then leads to increase in

profitability. A company that is environmentally responsible will have increased good reputation, and good reputation increases sales and profitability for business. Porter and Van der Linde, (1995) believe that environmental investments not only pay for themselves but also produce a profit in most cases, while improving environmental quality at the same time. They believe that environmental insensitivity lowers a firm's sales and increases its cost. The reputation of corporate brands among stakeholders provides an appropriate analytical framework for considering the impact of corporate social performance on financial profitability

VI. THEORETICAL REVIEW

Stakeholder's Theory: According to Bassey, Sunday & Okon (2013), the basic proposition of the stakeholder's theory is that the firm`s success is dependent on the successful management of all the associations that it has with its stakeholders. In a broader view, the concept of stakeholder view can be expressed in the sense that the role and purpose of the organization is not anymore guided by profit-taking and maximization of shareholder's wealth; but also to defend the image and values respecting the special relationships that arise and develop between it and all its stakeholders (Friedman & Miles, 2006).

The main focus of the stakeholders" theory in environmental accounting is to address the environmental cost elements and value in the inclusion of a firm's financial statement. The stakeholders" theory proposed an increased level of environmental awareness which creates the needs for companies to extend their corporate planning to include the non-traditional stakeholders like the regulatory adversarial groups in order to adopt a changing social demand (Trotman, 1999).

Legitimacy Theory: Legitimacy theory was derived from the concept of organizational legitimacy,and it was propounded by Dowling and Pfeffer in 1975. Legitimacy theory asserts that businesses always work to make sure they are operating within the laws and customs of the communities in which they operate. The theory is hinged on the assumption that accounting for sustainable development and the associated role of management accounting in sustainable development are used as communication mechanisms to inform or manipulate the perception of the entity's actions (Mistry, Sharma & Low, 2014; Tamunotonye & Ifeanyichukwu, 2021). The theory creates the idea that external stakeholders demand a company to take all necessary steps to ensure that its activities are transparent and compliant with legal and economic standards. The objectives of this theory can be identified as describing the relationship between a company and the community; explaining companies' motivations for social and environmental disclosures presenting how companies can use legitimacy strategies and determining the impacts of social and environmental disclosures on the public and society.

Empirical Review

Enetjärn et al. (2015) published a report on Environmental compensation : Key conditions for increased and cost effective application commissioned by The Nordic Council of Ministers in order to better understand the conditions for increased and cost efficient use of environmental compensation in the Nordic countries. They concluded that while the ultimate goal should be to reach No Net Loss of biodiversity and ecosystem services, they believe a realistic short-term goal of increasing compensation should be based on an "acceptable level of loss."

Tapang et al.. (2020) studied Environmental Activities and Its Implications on the Profitability of Oil Companies in Nigeria. The results revealed that there is a significant relationship between environmental activities and profitability.

Faure (2020) Studied Environmental liability of companies commissioned by the European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs. The study concluded that there are so far not many cases applying the Environmental Liability Directive (ELD), and that in really large pollution cases multiple instruments need to be applied. The study recommended that companies should be exposed to the full social costs of the environmental harm they are causing in order to provide them incentives to internalize environmental externalities optimally, and many other recommendations.

Chukwu, Idamoyibo & Akunna (2020) studded Environmental Liability Estimates and Equity Value

of Oil Firms in Nigeria. Findings indicated that investors in Nigeria's oil and gas firms negatively value environmental liability estimates

Ikponmwosa & Ogbeide (2021) studied Environmental Responsibility And Firm Financial Performance: Evidence From International Oil Companies In Niger Delta. The study reveals that there is a bi-directional relationship between environmental responsibility and firms' financial performance. The study further reveals that there is a positive relationship between environmental responsibility and firms' financial performance. When environmental responsibility interacts with corporate governance, the impact is found to have a significant positive relationship with firms' financial performance.

Nkwoji (2021) investigated the relationship between environmental accounting and profitability of selected quoted oil and gas companies in Nigeria in years 2012-2017. The result of the study showed that there was no significant relationship between environmental expenditure and net profit of the oil and gas companies in Nigeria under study

VII. RESEARCH METHODOLOGY

- Research Design

To evaluate whether Environmental liability has any impact on financial performance, we compare performance of firms who disclose environmental liabilities with the environmental liabilities incurred. The study made use of ex-post facto research design because the data for the study is already available or in existence and the research has no plan to change or control the variable. The population is therefore made up of upstream oil and gas companies listed on the floor of the Nigerian Exchange Group and have consistently submitted their annual reports from 2005 to 2020. A sample size of five (5) listed upstream oil and gas companies in the upstream sector were selected. The study makes use of secondary data, covered a period of 16 years (2005 to 2020) from the Annual reports and accounts of listed oil and gas companies on the Nigerian Stock Exchange. The statistical tool for the Hypothesis was the ordinary least square regression method and E-view (10.0) version.

- Model Specification

Each model represented a given hypothesis, respectively. The equation therefore is represented as;
Financial Performance = f(Environmental liability)
Thus, the model is specified into functional form as follows:

$$MV = \alpha_0 + \alpha_1 REMO + \alpha_2 COM + \varepsilon_i \text{ (i)}$$

$$PFR = \beta_0 + \beta_1 REMO + \beta_2 COM + \varepsilon_i$$

(ii)
where
REMO = Remediation Obligation
COM = Compensation Obligation
MV = Market Value
PFR = Profitability

α_0, β_0 = Intercepts

α_1, β_1 = coefficient of CMO

α_2, β_2 = coefficient of REMO

ϵ = stochastic error term

- Data Analysis and Results

The results for different measures of environmental liability and financial performance of the listed upstream oil and gas companies including Remediation Obligation, Compensation Obligation, Market Value and Profitability are presented in the following section. First, the descriptive analysis is presented followed by Panel regression analysis to see the association between environmental liability and financial performance.

Table 1:Summary of Descriptive Statistics

	CMO	MV	PFR	REMO
Mean	2119572.	1.00E+11	-194014.0	302526.8
Median	1767625.	6.79E+10	2573781.	59375.50
Maximum	8815810.	4.33E+11	19576228	1509107.

Minimum	711.0000	8.44E+09	-66497549	393.0000
Std. Dev.	2238959.	8.91E+10	12461421	403988.6
Skewness	1.594000	2.067601	-3.476928	1.337642
Kurtosis	5.048729	7.022113	16.84406	3.765287
Jarque-Bera	186.6883	432.6048	3120.184	100.6565
Probability	0.000000	0.000000	0.000000	0.000000
Sum	6.61E+08	3.12E+13	-60532376	94388348
Sum Sq. Dev.	1.56E+15	2.47E+24	4.83E+16	5.08E+13
Observations	312	312	312	312
Cross sections	4	4	4	4

Source: E-View 10 Output (2023)

Table 1 presents the descriptive statistics of the Environmental liability on Financial Performance of Quoted Oil and Gas Companies in Nigeria during the period of 2005 to 2020. The table shows that CMO has a mean of 2119572 with a standard deviation of 2238959 and the minimum and maximum values of 711 and 8815810 respectively. The range between the minimum and maximum is wide which implies an unstable performance as indicated in the standard deviation that there is a wide dispersion of the data from the mean value. Also, the mean values for Environmental Remediation obligation cost is 302526.8. The standard deviation values shown on table 1 indicate the dispersion or spread in the data series. The higher the value of the standard deviation, the wider the deviation of the series from its mean. For the other measure of Financial Performance, Market Value (MV) the table shows a mean of 100000000000 with standard deviation of 8910000000 and the minimum and maximum values of 89100000 and 433000000000 respectively. This implies that the Financial performance in terms of Market Value witnessed some fluctuations during the study period,

as the standard deviation is large compared to the mean, together with the wide range between the minimum and maximum values. Similarly, the smaller the value of the standard deviation, the lower the deviation of the series from its mean. The variable with the highest degree of dispersion from the mean is the market value. Skewness which measures the shape of the distribution and equally shows the measure of the symmetry of the data set, indicated that CMO, MV and REMO are all positively skewed and have values greater than zero which suggest that the distribution tails to the right-hand side of the mean, except for PFR, which is negatively skewed. Kurtosis value measures the peakness and flatness of the distribution of the series. From the above table 1, all the variables have kurtosis more than 3 indicating that their distributions are abnormal. The Jarque-Bera statistic is for testing normality of a variable shows that all the variables were not normally distributed.

Test of Hypothesis One
H_{o1}: There is no significant relationship between remediation obligation and market value of listed oil and gas companies in Nigeria.

Table 2: Random Effect Regression Result (Hypothesis One and Three)

Cross-section random effects test equation:
Dependent Variable: MV
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.27E+11	6.55E+09	19.33984	0.0000
CMO	-20108.97	3309.198	-6.076688	0.0000
REMO	52835.86	18340.02	2.880905	0.0042

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.827190	Mean dependent var	1.00E+11
Adjusted R-squared	0.812929	S.D. dependent var	8.91E+10
S.E. of regression	8.39E+10	Akaike info criterion	53.16258
Sum squared resid	2.15E+24	Schwarz criterion	53.23456
Log likelihood	-8287.363	Hannan-Quinn criter.	53.19135
F-statistic	8.918389	Durbin-Watson stat	0.840479
Prob(F-statistic)	0.000000		

Table 2 above, the coefficient of multiple determinations (R^2) is 0.82719. This indicates that about 83% of the total variations in Market Value is explained by the variations in the independent variable (CMO and REMO), while the remaining 17% of the variation in the model is captured by the error term. This indicates that the line of best fit is highly fitted. The standard error test is applied in order to measure the size of the error and determine the degree of confidence in the validity of the estimates. The value of F-statistic is 8.9184 and the value of the probability of F-statistic is 0.000000. This result implies that the overall regression is positive and statistically significant at 5%.

Test of Hypothesis Two
H_{02}. There is no significant relationship between remediation obligation and profitability of listed oil and gas companies in Nigeria.

Table 3: Random Effect Regression Result (Hypothesis Two and Four)

Cross-section random effects test equation:
Dependent Variable: PFR
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3282153.	927233.9	-3.539725	0.0005
CMO	1.083077	0.457685	2.366422	0.0186
REMO	2.846988	2.534309	1.123379	0.2621

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.674093	Mean dependent var	-125424.2
Adjusted R-squared	0.659349	S.D. dependent var	12313699
S.E. of regression	11942707	Akaike info criterion	35.44771
Sum squared resid	4.48E+16	Schwarz criterion	35.51837
Log likelihood	-5665.634	Hannan-Quinn criter.	35.47593
F-statistic	5.025381	Durbin-Watson stat	0.701588
32Prob(F-statistic)	0.000191		

In the estimated regression line as indicated in Table 3, the coefficient of multiple determinations (R^2) is 0.674093. This indicates that about 67% of the total variations in Profitability (PFR) is explained by the variations in the independent variable (CMO and REMO), while the remaining percentages of the variation in the model is captured by the error term. This indicates that the line of best fit is highly fitted. The standard error test is applied in order to measure the size of the error and determine the degree of confidence in the validity of the estimates and it can be concluded that the estimate is statistically significant. The value of F-statistic is 5.025381 and the value of the probability of F-statistic is 0.000191. This result implies that the overall regression is positive and statistically significant at 5% level of significance

- Discussion of Findings

The present study examined statistically the relationship between Environmental liability and Financial Performance of upstream Oil and Gas companies in Nigeria from 2005-2020. Environmental liability was measured with Remediation obligation cost and Environmental compensation cost while financial performance was represented by market value and Profitability. Multiple regression analysis was employed. Based on the hypotheses tested, the result revealed that;

For Hypothesis One

H_{o1}: There is no significant relationship between remediation obligation and market value of listed oil and gas companies in Nigeria.

Utilizing the regression output above, Amount Spent on remediation has a positive (B = 52835.86 t= 2.88; Sig. = .0042) relationship with market value and judging by the significance level of .0042 which is less than the 0.05 significance level as depicted in the regression table above, the study therefore rejected the null hypothesis and concludes that, there is a significant positive relationship between Amount Spent on remediation obligation and market value.

For hypothesis Two,

H_{02}. There is no significant relationship between remediation obligation and profitability of listed oil and gas companies in Nigeria.

From the regression output in table 3 above, remediation obligation has a positive (B = 2.85; t= 1.12; Sig. =.262) relationship with profitability, however, judging by the significance level of .262 which is greater than the 0.05 significance level as depicted in the regression table above, the study therefore concludes; There is relationship between remediation obligation and profitability but not significant. The null hypothesis was accepted. This agrees with the findings of Nkwoji (2021) showed that there was no significant relationship between environmental expenditure and net profit of the oil and gas companies in Nigeria under study

For hypothesis three,

H_{03}: There is no significant relationship between compensation obligation and market value of listed oil and gas companies in Nigeria.

Utilizing the regression output above, amount spent on compensation obligation (B = -20108.97; t= -6.08; Sig. =.000) negatively but significantly relate with market value. The study therefore rejected the null hypothesis and concludes there is a significant negative relationship between amount spent on compliance obligation and market value. This result is in line with the findings of Chukwu et al. (2020) whose findings indicated that investors in Nigeria's oil and gas firms negatively value environmental liability estimates

For hypothesis four,

H_{04}: There is no significant relationship between compensation obligation and profitability of listed oil and gas companies in Nigeria.

From the extract of the analysis above, amount spent on compliance obligation (B = 1.083; t= 2.37; Sig. =.019) positively and significantly relate with profitability. The result of the fourth hypothesis revealed that there is a positive significant relationship between amount spent on compliance obligation and profitability of the oil and gas companies. The study therefore rejected the null hypothesis and concludes there is a relationship between amount spent on compliance obligation and profitability. This is in agreement with the findings of of Tapang et al. (2020) whose results revealed that there is a significant

relationship between environmental activities and profitability.

Limitation to the study
Majority of the big upstream oil and gas companies that operate in Nigeria do not publish their financial statement on the Nigeria stock exchange, this made it impossible to include them in the sample of the study.

Summary of the Findings.
The findings are summarily listed below:

1. There is a significant and positive relationship between remediation obligation and market value of listed oil and gas companies in Nigeria
2. There is no significant relationship between remediation obligation and profitability of listed oil and gas companies in Nigeria.
3. There is a negative relationship between amount spent on compensation obligation and market value.
4. There is a positive significant relationship between amount spent on compensation obligation and profitability of the oil and gas companies

CONCLUSION

Based on the findings of the study, Using dimensions of Compensation obligation and profitability, and the dimensions of Remediation Obligation and Market Value, Environmental liability has a positive and significant relationship with financial performance of oil and gas companies in Nigeria.

Using dimensions of Remediation and profitability, Environmental liability Obligation has no significant relationship with financial performance of oil and gas companies in Nigeria. This could be because the costs committed to environmental liabilities by oil and gas firms in Nigeria are not significant enough in comparison to the profit they make from the damages caused to the environment. When applying the dimensions of Compensation Obligation and market value, Environmental liability has a negative relationship with financial performance of listed upstream oil and gas companies in Nigeria. it could be because the investors are not impressed with the environmental activities of the oil and gas companies in the environment they operate.

Despite that, there is a positive relationship with the remediation obligation and the market value and the compensation obligation and profitability.

Two out of the four hypotheses concludes that there is a positive and significant relationship environmental liability and financial performance of oil and gas firms listed on Nigeria stock exchange This therefore study concludes that there is an indication that there is significant and positive relationship between environmental liability and financial performance of listed oil and gas firms in Nigeria, although it is a weak significant and positive relationship.

RECOMMENDATIONS

For the relationship between environmental liability and financial performance of listed oil and gas firms in Nigeria to remain significant and positive, the following recommendations are made:

i. Oil and gas companies in Nigeria should spend significant amount on remediation to measure up to the damages caused to the environment and to individuals affected by their activities in the cause of their operation. The government and regulatory bodies should step up in enforcing and overseeing that there is greater commitment to environmental liability and responsibility by oil and gas companies in Nigeria
ii. It has been observed that lack of regulatory finance hinders regulatory enforceability, It is advised that the government apportions adequate finance to regulatory bodies enforcing these environmental laws and disclosure standards so that the regulatory agencies can effectively carry out their functions and responsibilities. Bewley (2005) predicted that the association between reported environmental liabilities and market value was significantly affected by the regulation with higher enforceability. The higher the finance appropriated for regulation, the higher the enforceability of these regulations. When the government increases its attention and finance apportioned to regulation, oil firms will comply accordingly because they are being monitored effectively
iii. The government should be more committed in overseeing the activities of oil and gas companies

to ensure damage to the environment is minimal in the cause of their operations

iv. Oil and gas companies should ensure that proper commitments are made to ensure that appropriate compensation is made to individuals affected by damage caused in the cause of their operation.

Areas For Futher Research

This study used Remediation cost and Compensation cost as dimensions of Environmental liability and this study focused on expenditures. There are other aspects of environmental liabilities, also contingent liabilities were not taken into consideration, future outflows can be taken into consideration for further research.

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