

PROSPECT OF MANDATORY ENVIRONMENTAL SUSTAINABILITY REPORTING IN NIGERIA: A NOTE OF CAUTION

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Abstract:

The prospect of sustainability reporting becoming mandatory is raising concerns about its likely threat to the survivability of some businesses. This study was conducted as a result to investigate the consequence of firms' adoption of environmental sustainability reporting on their exposure to insolvency risk. The study's population consists of Nigerian oil and gas companies that are quoted on the floor of the Nigerian Stock Exchange. Using a purposive sampling method, secondary data were acquired from published annual financial statements of population members for the years 2019 and 2020. Environmental sustainability was operationalised in terms of eight environmental sustainability reporting dimensions which were used to construct the environmental disclosure score, while corporate insolvency risk was measured in terms of probability function of Altman' Z-score. Financial performance was used as the moderating variable. Pooled multiple regression technique was utilized for the analysis based on a 5% level of significance. Our analyses led us to find that environmental sustainability reporting significantly exerts a negative impact on corporate insolvency risk thus allaying stakeholders' apprehension about the institutionalization of sustainability reporting in Nigeria. But it was also found that beyond a certain degree of negative profitability, there exists a possibility for environmental sustainability reporting to significantly exert a positive impact on corporate insolvency risk. It was therefore concluded that, though the concern about sustainability reporting appears to be unfounded because of the confirmed deterrence of environmental sustainability reporting against corporate insolvency risk, it is imperative for regulators to approach any implementation of sustainability reporting with cautious optimism. In line with the conclusion reached, it is the recommendation of this study that governments and regulators should work to incentivize businesses (e.g. tax waivers) to increase their commitment to environmental sustainability reporting rather than a forceful imposition on them.

Keywords: Environmental Sustainability; Insolvency Risk; Financial Performance, Nigeria.

1. Introduction

With growing awareness and acceptance of the fact that the deteriorating geo-thermal condition is a result of environmental exploitation for profit motive, the calls for businesses to adopt sustainability reporting is getting louder. Especially for environmentally dependent businesses, it is suggested that environmental sustainability reporting (ESR) may be able to compel such businesses to adopt Eco-friendly dispositions in their modus operandi. If this is true, corporate insolvency risks of environmentally dependent companies should be deterred by their environmental sustainability reporting practices.

This is because sustainable business practises are not only touted for their ability to attract patronage, but also for their capacity to cut capital costs. However, whether this postulation holds true or not remains to be established in Nigerian context.

There are numerous interlinked transmission mechanisms through which the insolvency risk of a business might be tied to ESR. To begin, firms that report on environmental sustainability at a higher level face less regulatory risks, since they are less likely to pay penalties for environmental violations and are better equipped to respond to any legislative changes affecting environmental issues. Second, going by a study recently conducted by a group of scholars (Leiserowitz, Maibach, Roser-Renouf, Rosenthal, Cutler, & Kotcher, 2018), popular opinions on the environment have shifted, resulting in heightened public awareness and media attention. As a result, many buyers have developed a heightened awareness of ecological issues and are punishing environmental malfeasance by avoiding items manufactured by environmentally unfriendly corporations, which can result in large sales losses and profit erosion. To such a group, ESR becomes the sole means of pleading for self-exoneration. Third, companies concerned with environmental issues incur additional financial risk, as many investors include sustainability criteria in their investment process and so either refuse to invest in those companies or require increased risk compensation. Again, ESR provides a mechanism for assuaging such environmental concerns. Thus, to support the preceding postulation in aggregate, a negative association between ESR and insolvency risk is predicted to exist.

The theoretical underpinning for the predicted negative relationship is not far-fetched. As averred by Al-Shaer and Zaman (2016) and Cong and Freedman (2011), businesses could voluntarily commit to and report on ecologically harmless measures in order to gain legitimacy through the approval and patronage of the larger community. According to legitimacy theory as enunciated in the studies by Branco and Rodrigues (2008); Liao et al. (2015); and Soobaroyen and Ntim (2013), environmental accountability reinforces transparency and compliance with sound environmental practises, increasing the likelihood of achieving competitive advantages while also meeting the expectations of the larger community and legitimising their activities. On the other hand, stakeholder theory says that by balancing the conflicting needs of many stakeholders, enhancing accountability and transparency through a stronger commitment to sound environmental practises can help improve a company's reputation and social standing (Dixon et al., 2005; Welford, 2007). Thus, both hypotheses imply that environmental sustainability reporting and firm insolvency risk are negatively associated.

However, some companies might rather find ESR too disadvantageous for adoption as routine practice but still run with it any way. For such firm, ESR correlates positively with their insolvency risks. The existence of a positive correlation between ESR and insolvency risk confirms a variety of concerns about the prohibitively high implicit and explicit costs involved with ESR maintenance. To begin, one example is the '*privacy invasion*' argument against sustainability reporting. Certain organisations prioritise operational privacy over the potential benefits of ESR adoption: these firms are prone to jealously guard their operational privacy.

Second, there are fears that reporting on sustainability may accidentally expose businesses to corporate espionage for trade secrets and potential lawsuits. Thirdly, there is concern about business financial performance being negatively impacted as a result of environmental sustainability reporting. From the objective of profit maximisation perspective, not taking full opportunistic advantage of the ‘*nature’s abundance*’ is a recipe for sub-optimality. Finally, businesses are weary of duplicating annual corporate reporting costs. Thus, if the disadvantages of ESR far surpass the benefits for a particular firm, ESR is likely to correlate positively with insolvency risk for that firm.

Although it seems counterintuitive for a firm having prior business intelligence on the toxicity of ESR and still indulging in it any way. This sort of behaviour is perfectly explainable. Institutional theory predicts that enterprises will adopt ESR due to societal pressure for sustainability reporting, rather than economic gains. Thus, even when the expense of ESR adoption significantly outweighs the benefit, enterprises continue to adopt it for the sake of legitimacy. Hence the likely outcome of mandatory implementation of ESR on environmentally dependent businesses is uncertain. To some, it will be economically beneficial, while to others it will not.

Sustainability disclosure in Nigeria is voluntary but recent indications suggest a drift of the mainstream reporting framework towards mandatory ESR regime. For instance in 2015, the Nigeria Stock Exchange sponsored a conference on sustainability in the capital market. Standard-setting bodies (such as the IASB) are reviewing the role of non-financial information in annual company reports. These developments point to real prospects of ESR being made mandatory for Nigerian companies. While mandatory ESR regime will benefit the wider society and will also facilitate financial statement comparability with some of the bigger economies in Africa (e.g. South Africa), its likely impact on some environmentally dependent businesses is largely unknown with certainty and needs investigating.

Not only are empirical research examining the association between business environmental sustainability reporting and insolvency risk sparse (Elmagrhi et al., 2019; Orazalin, 2020; Tran et al., 2020), but they are also faulty. Few studies have examined the relationship between corporate environmental sustainability reporting and insolvency (De Villiers et al., 2011; Elmagrhi et al., 2019; Garca-Martn & Herrero, 2020; Rupley et al., 2012), limiting our current understanding of the relationship between the two, particularly in the Nigerian context. Second, these few studies on environmental sustainability reporting are limited by their concentration on developed nations, such as Australia (Rao et al., 2012), the United States (De Villiers et al., 2011; Post et al., 2015; Rupley et al., 2012), the European Union (Garca-Martn & Herrero, 2020), China (Aslam et al., 2020), and the United Kingdom (Brammer & Pavelin, 2006 & 2008; Elmagrhi et al., 2019; Shahab et al., 2020). As a result of these deficiencies, we decided to conduct an empirical investigation into the relationship between environmental sustainability reporting and the risk of insolvency for publicly traded oil and gas companies in Nigeria.

This paper will continue as follows to achieve this objective: beginning with a summary of relevant theoretical and empirical literatures; next, a description of our sample, explanation of

the analytical method employed, and definition of the relevant variables. Next, a presentation and discussion of our findings will be made, and lastly, a summary, conclusions, and suggestions for future research will follow.

2. Literature Review

This section examines the extant literature

2.1 Theoretical Framework

2.1.1 Legitimacy Theory

Legitimacy theory (Dowling & Pfeffer, 1975) is essential for understanding the behaviour of an organization in evolving and applying policies on social responsibility, as well as communicating their results. It regards the organization's social and environmental performance, as well as the dissemination of this information, as a means of achieving the social compact that enables it to achieve its goals. The legitimacy theory's viability depends on the management legacy that links previous norms and ideals with modern ethics (Burlea & Popa, 2013).

Legitimacy is a command to act, to bestow legal authority on something, or to sanction. In addition, legitimacy is described as the popular perception or presumption that a subject's actions are desirable or appropriate within a socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995; and Deephouse & Suchman, 2008). A business acquires legitimacy through adhering to social norms and the law.

The legitimacy theory is predicated on the assumption that a corporation exerts influence over the society in which it operates. Concurrently, the company has a social impact, which is why its operations resemble a social contract designed to gain and maintain societal acceptability. In the era of Corporate Sustainability Reporting, this social approval of a company's actions is extremely crucial. In the framework of a socially responsible business, legitimacy is the authority to act in accordance with rational principles. Moreover, proving the legitimacy of an action is viewed as having positive effects on both the internal and exterior environments. It defends the legitimacy of affecting the depleting resources it owns and consumes, as well as those indirectly affected. The perceived resource constraints in the globe indicate an increasing requirement, which is transforming into a responsibility, to communicate the entity's responsible management to its internal and external contexts.

Thus, according to legitimacy theory, the link between sustainability reporting and going concern is contingent on social reciprocity, which is contingent on how the society decodes the coded message contained in the company sustainability report. Generally speaking, a socially and environmentally responsible organisation will receive corresponding patronage from society. As a result, corporations that report on sustainability earn significantly better financial success than those that do not. With this potential in mind, investors tend to perceive companies that include additional information in the form of sustainability disclosures in their annual reports more favourably (Wibowo, 2014). According to them, companies that disclose sustainability scorecards in their annual reports attract a premium over those that do not. Thus, according to

legitimacy theory, a company's legitimacy is established by socio-environmental accountability, which emotionally demands patronage, which the organisation depends on for survival (Rossi & Tarquinio, 2017). As a result, a positive correlation between sustainability reporting and continuing operations is anticipated.

2.1.2 Stakeholders' Theory

Stakeholder Theory is a school of thinking within capitalism that focuses on the interdependent interactions between firms and their consumers, suppliers, employees, investors, and other stakeholders (Freeman, 1984). A business is supposed to provide value for all of its stakeholders, not only its shareholders, in accordance with this idea. In a paradigm based on stakeholders, management considers the needs of numerous groups. According to stakeholder theory, businesses have a large number of stakeholders and are reliant on each one for success. Each stakeholder group has an interest in the organisation. Its objective is not simply to generate economic profit for shareholders. It must satisfy society's requirements, and its scope is widened to cover social and communal concerns. According to Freeman (1984), managers are not merely shareholders' agents. As a matter of moral obligation, they must investigate and weigh the interests of all parties involved. He categorises the influence of stakeholders on the company or the company on stakeholders as economic, technological, social, political, and managerial. He describes the "stakes" of the various stakeholders as equity, economic, and influencer, and their power as formal or voting power, economic, or political power. Thus, organisations must strike a balance between their own interests and principles and the multiple and frequently conflicting interests of their various stakeholders (Greenley & Foxall, 1998).

Murphy, Maguiness, Pescott, Wislang, Ma, and Wang (2005) assert that it is reasonable to view the five stakeholder groups as indispensable to the running of a sustainable business. Shareholders finance the company, the Community allows it to exist, and Suppliers offer resources and services for Employees to create products and services that Customers prefer over those of competitors. Corporations do not exist in an exclusive shareholder-defined universe. Consequently, these groups of individuals, known as stakeholders, are essential to the organization's existence and development. If a firm requires the participation and collaboration of multiple stakeholder groups, it must successfully manage them. Corporations must avoid causing harm to their many stakeholders in the quest for profit. Instead, they should take proactive steps to enhance the working and living conditions of their employees, give back to the communities in which they do their business, and conserve and protect the environment. In a nutshell therefore according to stakeholder theory, exhibiting enhanced responsibility and transparency through a stronger commitment to sound environmental practises can assist improve a company's reputation/image by balancing the competing needs of many stakeholders (Dixon et al., 2005; Welford, 2007).

2.1.3 Institutional Theory

In the views of Baumol, Litan and Schramm (2009), the institutional theory proposed a theoretical perspective through which scholars can identify and study aspects that contribute to the survival and legitimacy of organisations, such as economic incentives, while recognising the significance of resources. Legitimacy refers to the employment of sustainable methods deemed fit and suitable by stakeholders (DiMaggio & Powell, 1983). Historically, institutional theory has focused on how groups and organisations can strengthen their positions and legitimacy by adhering to the rules and norms of their institutional environment (such as self-subjection to carbon and fossil footprint accountability, which impose conformance pressures) (DiMaggio & Powell, 1983, DiMaggio and Powell, 1991; Meyer and Rowan, 1991; Scott, 2007). This position is further affirmed by Jennings and Zandbergen (1995) and North (1990) when they averred in line with the institutional theory that, organisational strategies and decisions are influenced by external, social, political, and economic pressures, as they seek to gain acceptance or legitimacy from other stakeholders.

Institutional Theory recognises three basic types of drivers that contribute to the similarity of organisational strategies, structures, and processes. These are coercive, normative, and imitative influences (DiMaggio & Powell, 1983). Due to the power of dominant enterprises in the industry, coercion occurs. Environmental management and, by extension, sustainability rely heavily on coercive constraints (Kilbourne et al., 2002). In order for businesses to be considered as engaging in lawful conduct, normative drivers ensure that they comply with established norms (such as eco-friendly practises) (Sarkis et al., 2011). Ball and Craig (2010) found that normative pressures motivate businesses to become more environmentally conscious. They argue that institutional research is required to comprehend emerging social rules (e.g., ethical values and ecological thinking) and organisational responses to environmental issues. Thus, normative drivers exert influence due to a societal obligation to conform, which is based on social need or on what an organisation or individual ought to do (March & Olsen, 1989). Mimetic isomorphic drivers emerge when corporations imitate the behaviours of successful competitors in order to mimic their path to success and hence legitimacy (Aerts et al., 2006; Sarkis and al., 2011); for instance, dedicated sustainable means of acquiring oil drill sites.

Consequently, the institutional theory can likewise support the corporate environmental reporting behaviours of public oil and gas corporations in Nigeria. The occurrence of this behaviour may be costly, but as long as it legitimises the firms' activity, it is deemed worthwhile. Consequently, a positive association is projected to exist between ESR and insolvency, when viewed through the perspective of institutional theory.

The above theoretical discussions demonstrate unequivocally that no single theory can provide a comprehensive explanation for the environmental reporting behaviours of oil and gas firms in Nigeria. Therefore, we mix a range of theories in order to provide a deeper and more comprehensive understanding of the relationship between ESR and corporate insolvency risk. In any case, one of these is likely to provide an explanation that matches the empirical facts.

The conceptual framework of the study is presented in Figure-1 as follows:

2.2 Development of Hypothesis: Environmental Sustainability and Corporate Insolvency Risk

The link between environmental sustainability reporting and corporate insolvency can be bi-directional, as supported by available theories. On one hand, legitimacy and stakeholders' theories predict a negative relationship, while institutional theory supports the prospect of having a positive link between the two. Empirical confirmation of these theories suffers a bit of setback in that there are no studies in Nigerian empirical literature linking ESR and company insolvency risk directly.

However, in this section of the study just for the purpose of empirical review, a relevant mediating variable (financial performance) is employed in our attempt at linking up a possible relationship between the two variables. Financial performance is acceptable because it dominates the Nigerian empirical literature on ESR and other factors. Thus, from the viewpoint of financial performance as a proxy of insolvency risk, the available research on ESR and insolvency risk does not present a consistent picture. While most prior studies (Nnamani, Onyekwelu, and Ugwu, 2017; Ifurueze et al. 2013; Okafor, 2018; Sanusi and Sanusi, 2019) agree that ESR exerts positive influence on financial performance and hence reduces insolvency risk, others disagree, finding a mixed outcome.

The study by Tyokoso, Teghtegh, and Musa (2020) deserves special notice because it focused in part on the Nigerian oil and gas business. The study was aimed at examining the impact of sustainability reporting on the financial performance of Nigerian and Mozambican businesses. Regression was employed as the preferred tool of analysis using secondary data which were gathered from the published accounts of the sampled firms. Environmental reporting has a large and favourable effect on the financial performance of Oil and Gas enterprises in Nigeria and Mozambique, according to the study's findings. In addition, the study discovered that Nigerian and Mozambican oil and gas businesses report on sustainability in dramatically different ways.

Nevertheless, current studies (e.g., Adediran & Alade, 2013; and Asaolu, Agboola, Ayoola, & Salawu, 2011) demonstrate confusing (or contradictory) results, therefore failing to support the stakeholder and legitimacy hypotheses. In some research, identical assessments of profitability produce contradicting empirical outcomes. These discrepancies cast doubt on the frequently stated negative relationship between ESR and insolvency risk. As an example, Asaolu et al. (2011) evaluated sustainability reporting in the Nigerian Oil and Gas sector utilising six international Oil and Gas corporations operating in Nigeria. Using content analysis of annual reports, they determined that none of the studied organisations had sustainability performance indicators. Adediran and Alade (2013) examined the connection between environmental accounting and corporate performance in Nigeria. Environmental accounting was highly connected with lower net profit margins and greater dividends per share, according to the findings.

To add fuel to the skepticism about the legitimacy and stakeholders' theories' potency, other scholars claimed finding no association (e.g. Ezejiolor, John-Akamelu, Chigbo, 2016; and Onyinyechi & Ihendinihu, 2016). Thus, there is still confusion regarding the relationship between ESR and insolvency risk of quoted oil and gas companies in Nigeria, especially given the absence of a study directly analyzing the relationship, resulting in the existence of a gap in the literature. Therefore, given the theoretical analysis presented earlier and the predictions that followed, we present our hypothesis in the null form as follows:

H₀₁: *Environmental sustainability reporting does not significantly influence corporate insolvency risk of quoted oil and gas companies in Nigeria*

H₀₂: *Financial Performance does not significantly moderate the relationship between environmental sustainability reporting and corporate insolvency of quoted oil and gas companies in Nigeria*

3. Methodology

3.1 Data and sampling

The study's data samples contain financial and non-financial data. We got both data sets from the annual reports of publicly traded Nigerian oil and gas corporations. Originally, our sample consisted of all ten Nigerian oil and gas companies. We collected data for two years (2019–2020) because to the fact that many businesses have not yet produced results for 2021. The final year for which data was available was fiscal year 2020. In the end, we restricted our final sample to nine businesses with comprehensive data.

3.2 Variables

Table-1 is a summary of all the major variables that we employed to test our research hypotheses. First, this research uses corporate insolvency risk (CIR) as the main dependent variable. Probability value of Altman's (1968) Z-score was used as proxy in place of corporate insolvency risk. For each of the sampled firm, Z-scores for 2019 and 2020 were calculated using the following Z-score model:

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Following in the footsteps of Edward and Kishore (1999), each of the results of the Z-score was then converted to probability estimate of insolvency risk as follows:

$$CIR = \left(1 - \frac{1}{1 + e^{-z}}\right)$$

Table-1: Variables Definition

Name	Symbol	Operational Definition
Dependent Variable		
Corporate Insolvency Risk	CIR	Probability value of Altman's (1968) corporate insolvency Z-score
Dependent Variable		
Environmental Sustainability Reporting	ESR	Total score/ Optimal disclosure score.
Moderating Variable		

Financial Performance

PERF

Net profit before taxation / Total Assets

Second, *ESR* is used as an independent variable in this study. We quantify *ESR* using a content analysis method based on well-established works such as Asaolu et al. (2011), and Ntim et al. (2013). According to published research (Ntim et al., 2013), *ERS* has eight dimensions: “. . . clarity, environmental management, environmental liabilities, environmental costs, environmental investments, environmental performance, and system implementation”.

9

We assign a score to each item based on the qualitative or quantitative disclosures about environmental sustainability in the sample firms' annual and corporate social responsibility reports. In environmental sustainability disclosures, a value of '2', '1', or '0', respectively, denotes 'monetary information,' 'non-monetary information,' or 'no information.' Moreover, due to changes in quantitative data, the highest possible score for each item differs. The optimal rating for disclosure is therefore 24. (For additional details, see Table 2). *ESR* is determined by dividing the overall score by the optimal disclosure.

Lastly, we include *PERF* as a moderator variable, and based on recent research (Agbiogwu, Ihendinihu, Okafor, 2016; Ifurueze et al., 2013; Okafor, 2018), we anticipate that *PERF* will have a large moderating effect on *ESR*.

3.3 Model Specification

In line with the stated objective, the focus of the study is to evaluate the impact of *ESR* on *CIR*, using 5% significance threshold. Accordingly, we employ the following ordinary least squares regression model:

$$CIR = b_0 + b_1ESR + b_2PERF + U \quad \dots \text{Eqn.(1)}$$

where b_1 is the focus of the study. The *a priori* expectation is $b_1 < 0$ (i.e. upholding stakeholders' and legitimacy theories) or $b_1 > 0$ (i.e. confirming institutional theory).

4. Results and Discussion

4.1 Descriptive Analysis

The third table includes descriptive statistics for *CIR*, *ESR*, and moderator factors for nine publicly traded oil and gas businesses. According to Table-3, the *ESR* spans from 0% to 50%, with an average of 22.45%, which is lower than the findings of certain research (Tyokoso, Teghtegh & Musa, 2020). This result also contradicts the findings of Asaolu et al. (2011), who studied sustainability reporting in the Nigerian Petroleum sector using six major Oil and Gas multinational corporations plying their trade in Nigeria; and content analysis, and found that none of the sampled organisations included sustainability performance indicators. These data imply that environmental performance in Nigeria's oil and gas industry is extremely low, and that corporations are not particularly enthusiastic about publicising environmental performance.

Table-3: Descriptive Statistics

	<i>PERF</i>	<i>ESR</i>	<i>CIR</i>
Mean	0.126278	0.224537	0.0028847
Standard Error	0.085802	0.0292	0.0015064
Median	0.055736	0.208333	1.452E-05
Std Deviation	0.364029	0.123883	0.0063913
Sample Variance	0.132517	0.015347	4.085E-05
Kurtosis	16.46715	0.869602	2.257324
Skewness	3.981834	0.177806	1.9853305
Range	1.668697	0.5	0.0182144
Minimum	-0.11077	0	0
Maximum	1.557923	0.5	0.0182144
Count	18	18	18

Table-4 (see appendix) presents breakdown of the average score along the dimensions used to measure ESR.

According to figure-2, only seven (7) benchmark dimensions manifested out of the eight (8) used. Of the manifested dimensions, *Environmental Investment* (8.33%) contributed to the meager average most followed by *Environmental Performance* (5.56%), and *Reliability* (3.24%). The least among them is *Clarity* (0.23%). *Environmental Liability* failed to register any presence. This might not be unconnected with concerns for possible litigation avoidance on the part of the reporting entity.

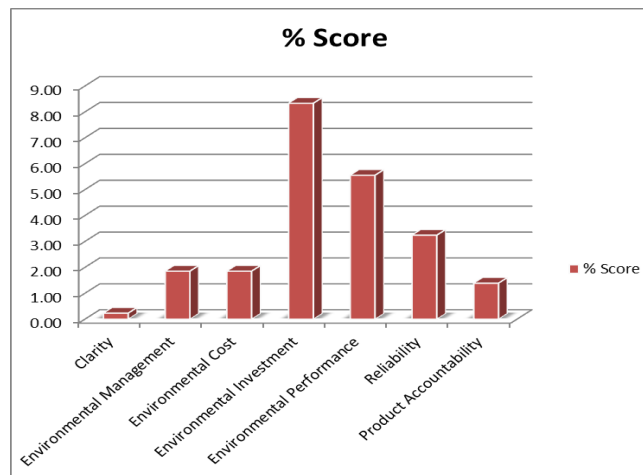


Figure 2: Environmental Sustainability Disclosure Score of Quoted Oil & Gas Companies in Nigeria

Table-3 also shows an approximate mean corporate insolvency risk of 0.29% with a standard deviation of 0.64%. The maximum and minimum insolvency risks are 1.82% and 0%. The foregoing statistics indicate solvent oil and gas industry with entrenched prospect of going-concern. Although the standard deviation and other metrics of dispersion are revealing a solvency distribution that is asymmetric, mostly skewed to the left of the distribution. However, we suspect this might have to do with the data size, which is why we have to use robust standard

error in our regression analysis in order to mitigate the bias that may result from this short-coming.

4.2 Inferential Analysis

Table-5, presents the result of correlation analysis showing the association between the response and explanatory variables and the interrelationship among the explanatory variables as well.

Table-5: Correlation Matrix

Correlation Probability Observations	CIR	ESR	PERF
CIR	1.000000 ----- 18	-0.628006 0.0053 18	0.110423 0.6627 18
ESR	-0.700585 0.0012 18	1.000000 ----- 18	-0.618586 0.0062 18
PERF	-0.025927 0.9187 18	-0.342821 0.1637 18	1.000000 ----- 18

The top half diagonal elements of the correlation matrix are results from Spearman’s correlation coefficients while the lower half diagonal element are results from Pearson’s moment correlation coefficients. Apparently, the results are not consistent, mainly due to data insufficiency. However, both results indicate significant negative correlation between ESR and CIR. While both measures agree on direction of relationship between PERF and ESR, their verdicts on 5% statistical significance differ. Spearman’s correlation confirms significance whereas Pearson’s correlation coefficient confirms insignificance. Given the data size limitation, the Spearman’s correlation verdict appears to be more reliable, hence we have cautious optimism on the moderating influence of financial performance on the CIR – ESR nexus.

In view of the high correlation between ESR and PERF, multicollinearity was tested with variance inflation factor (VIF), and the result revealed consistently low values for all the study variables suggesting that multicollinearity is not a problem of the dataset. Consequently, our hypotheses were analysed using regression analysis, using White-Hinkley (HC1) heteroskedasticity consistent standard errors.

Table-6: Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ESR	-0.041477	0.013287	-3.121546	0.0070
PERF	-0.005294	0.001479	-3.578538	0.0027
C	0.012866	0.003449	3.730214	0.0020
R-squared	0.571060	Mean dependent var		0.002885
Adjusted R-squared	0.513868	S.D. dependent var		0.006391
S.E. of regression	0.004456	Akaike info criterion		-7.838021
Sum squared resid	0.000298	Schwarz criterion		-7.689625
Log likelihood	73.54219	Hannan-Quinn criter.		-7.817559
F-statistic	9.984964	Durbin-Watson stat		1.559055
Prob(F-statistic)	0.001750	Wald F-statistic		6.789782
Prob(Wald F-statistic)	0.007948			

Based on the results from table-6, the regression equation model for CIR can be stated as follows:

$$CIR = 0.01287 - 0.0414*ESR - 0.00529*PERF + e \dots \dots (Eqn2)$$

The regression equation illustrates the direction of ESR effect on CIR. The negative regression coefficient for ESR indicates that it has a diminutive influence on CIR. Similarly, the negative regression coefficient for PERF indicates that increasing corporate profitability reduces insolvency risk. The constant term (0.012866) indicates average company-specific factors in the industry which contribute to corporate insolvency in the industry. The regression coefficient (ESR) of -0.0414 indicates the rate at which corporate insolvency risk decreases when oil companies increase their environmental disclosure by an extra unit. Each of these regression coefficients is significant at the 1% level since their probability values are less than the 5% criterion.

The F-significance seeks to determine whether all explanatory variables in the model have a joint effect on the response variable. This equation model has a significance value of 0.007948, which is less than the significance level of 0.05. This indicates that the explanatory variables affect the response variable concurrently or together, hence it may be concluded that this model is worth applying or fitting for prediction. Adjusted-R² attempts to quantify the extent to which the model can explain fluctuations in independent variables. The greater the coefficient of determination becomes, the greater the independent variables' capacity to explain the dependent variable. In this instance, ESR and PERF can explain 51.39 percent of CIR's fluctuating behaviour. Hence, regarding the hypothesis (H₀₁), there is sufficient statistical reason to reject the hypothesis that *Environmental sustainability reporting does not significantly influence corporate insolvency risk of quoted oil and gas companies in Nigeria.*

For the second hypothesis (H₀₂), we have to test whether PERF moderates the degree of CIR response elasticity of ESR or not. To this aim, we include another variable representing the interaction effect between PERF and ESR in in the original Equation. Accordingly, our regression assumes the following new form:

$$CIR = \beta_0 + \beta_1*ESR + \beta_2*PERF + \beta_3*PERF*ESR + e$$

The fourth term represents the interaction effect, and will be deemed to having moderating impact on *CIR* if its coefficient (i.e. β_3) is statistically significant at 5% level. Table-7 presents the result of the moderated regression.

Table-7: Result on Moderating Influence of Financial Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ESR	-0.043419	0.006493	-6.686866	0.0000
PERF	0.024553	0.003929	6.249691	0.0000
PERF*ESR	-0.234823	0.027607	-8.505898	0.0000
C	0.012763	0.001937	6.587339	0.0000
R-squared	0.806719	Mean dependent var		0.002885
Adjusted R-squared	0.765302	S.D. dependent var		0.006391
S.E. of regression	0.003096	Akaike info criterion		-8.524084
Sum squared resid	0.000134	Schwarz criterion		-8.326223
Log likelihood	80.71675	Hannan-Quinn criter.		-8.496801
F-statistic	19.47785	Durbin-Watson stat		2.038935
Prob(F-statistic)	0.000029	Wald F-statistic		44.60416
Prob(Wald F-statistic)	0.000000			

In accordance with the results from table-7, the moderated regression equation model for *CIR* can be stated as follows:

$$CIR = 0.01276 - (0.0434 + 0.248*PERF)*ESR + 0.02455*PERF \quad \dots \text{(Eqn3)}$$

According to the obtained equation, if *PERF* takes a negative value beyond -0.1848 (i.e. $-0.0434 \div 0.248$), the negative relationship between *CIR* and *ESR* will change to be a positive one. This means the negative relationship between *CIR* and *ESR* does not continue without limit. Hence with moderation, the obtained imply that *CIR* response rate for every unit increase in *ESR* depends on *PERF*. Therefore regarding hypothesis (H_{02}), there is sufficient statistical reason to reject the hypothesis that *Financial Performance does not significantly moderate the relationship between environmental sustainability reporting and corporate insolvency of quoted oil and gas companies in Nigeria*.

The current study's results are consistent with the arguments that suggest the confirmation of the legitimacy theory. In order for oil and gas companies to retain their legitimacy, they reveal their stance on a variety of environmental issues in their yearly report, which serves as the legitimacy device. They use this media to indicate good revelations that strengthen their credibility. As a result, their reputation will be enhanced and they will become more appealing to society. Consequently, the legitimacy hypothesis indicates that when businesses reveal information on sustainable development, this improves their reputation, which in turn attracts patronage from the general public. The patronage might be in the form of a reduced necessary rate of return from

investors and an increase in the number of consumers, resulting to an improvement in the company's performance and so easing their survival worries.

Thus, the concerns often expressed by those opposed to environmental sustainability reporting, particularly Nigerian oil and gas companies, are not founded. However, the result's implication should be taken with caution as a lot depends on the profitability of the firm's operations. This is because, there is an indication that the confirmed negative relationship between corporate insolvency risk and environmental sustainability reporting is not without limit. Hence the result corroborates the findings of Tyokoso et al. (2020) whose study sought to determine the influence of sustainability reporting on the financial performance of oil and gas firms in Nigeria. In contrast, the result contradicts the findings of Asaolu et al. (2011), who studied sustainability reporting in the Nigerian Oil and Gas sector by employing 6 dominant Oil and Gas multinational corporations plying their trade in Nigeria; and content analysis of annual reports and discovered that sustainability performance indicators were not present in any of the sampled organisations.

5. Summary and Conclusion

Environmental challenges and difficulties have grown in prominence over the previous decade, seizing the environmental community's and governments' attention. As a result, Nigerian regulatory agencies are beginning to press businesses for increased environmental accountability and disclosure. This has raised some concerns about the potential of a mandatory sustainability reporting framework in which one-size-fits-all solutions are not always possible. Despite these concerns, research on the impact of environmental sustainability reporting on company insolvency risk in Nigeria is uncommon. As a result, we investigated the effect of environmental sustainability reporting on corporate insolvency risk. Notably, we also explore the moderating effect of financial performance on the nexus between ESR and insolvency risk. The findings of this study led us to conclude that, though the concern about sustainability reporting appears to be unfounded because of the confirmed deterrence of environmental sustainability reporting against corporate insolvency risk, it is imperative for regulators to approach any implementation of sustainability reporting in Nigeria with cautious optimism.

This study contributes in more than one way to the existing body of information relating business strategy and the environment in developing countries. Firstly, this study contributes to the body of information on environmental sustainability reporting and corporate insolvency risk in an industry notorious for environmental contamination, particularly the oil and gas industry. Secondly, we used a content analysis technique to develop an all-encompassing score for environmental disclosure that takes into account eight different dimensions such as the clarity of the disclosure itself as well as its environmental management, liability, costs, and investments. This study contributes to the existing knowledge by exploring the association between ESR and business insolvency risk from many vantage points (e.g., institutional, stakeholder, and legitimacies theories).

Our findings have significant policy and regulatory consequences. For example, our sampled firms' environmental disclosure ratings appear to vary and are generally low when compared to stated disclosure scores in other developing countries. As a result, regulatory authorities, such as the Financial Reporting Council of Nigeria and the Nigerian Stock Exchange, can work to provide clear guidance on the most effective methods for disclosing environmental sustainability information, resulting in improved environmental sustainability reporting. In addition, although sustainability reporting is optional in Nigeria and businesses generally adhere to environmental requirements, their quality of environmental sustainability disclosure appears to be low, indicating that firms' environmental sustainability strategies could be enhanced. As a result, governments and regulators should work to incentivize businesses (e.g. tax waivers) to increase their commitment to environmental sustainability reporting rather than a forceful imposition on them.

Among the limitations of this study are the following: (i) a limited sample size; (ii) a short time period; (iii) the use of a straightforward measure of ESR; (iv) a concentrate on a single nation; and (v) the absence of alternative financial performance metrics (i.e., ROE, Net Profit Margin). Therefore, future research may build on these findings by employing a larger sample size, a longer period, different ESR indicators, a sample from numerous nations, and alternative financial performance. In addition, our methodology evaluates just ESR reporting and not the other three sustainability reporting pillars. Thus, future study may expand the notion of sustainability considering our findings.

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