MRN Publishing

Vol. 12, No. 21, 2024, pp. 11–15.
ISSN 1596−5074

Management Network Journal

The Value Relevance of Environmental Accounting Disclosure: Evidence from the Nigerian Natural Resource Sector

Aisha Ibrahim Umar [1]*, Ibrahim Ali Bappa [1]

[1] *Department of Accountancy, School of Management Sciences, The Federal Polytechnic Damaturu, Nigeria.*

Abstract

This study investigates the financial implications of environmental accounting disclosure for firms operating in Nigeria's economically vital but environmentally sensitive natural resource sector. Grounded in Legitimacy Theory, we hypothesize that higher quality environmental disclosure enhances firm value by reducing information asymmetry and improving stakeholder perceptions. We test this hypothesis using a panel dataset of 40 publicly listed firms over a five-year period from 2018 to 2022, resulting in 200 firm-year observations. Firm value is measured using Tobin's Q, while environmental disclosure is quantified through a comprehensive 15-point Environmental Disclosure Quality Index (EDQI) developed via content analysis of corporate annual reports. Using a firm fixed-effects regression model to control for unobserved heterogeneity and other determinants of firm value (firm size, leverage, and profitability), our findings reveal a statistically significant and positive relationship between the quality of environmental disclosure and firm value ($\beta = 0.134$, $p < 0.01$). The results are robust to alternative model specifications. This study provides strong evidence that, for firms in Nigeria's resource sector, strategic investment in transparent environmental reporting is not merely a compliance cost but a value-enhancing activity. The findings have significant implications for corporate managers, investors, and policymakers seeking to align corporate incentives with national sustainability goals.

Keywords: *Environmental Accounting, Firm Value, Tobin's Q, Legitimacy Theory, Disclosure Quality, Nigeria, Natural Resource Sector.*

Introduction

The global economy is at a critical juncture where corporate performance is increasingly evaluated through the lens of sustainability. Stakeholders, from investors to consumers, now demand that corporations demonstrate accountability for their environmental and social impacts (Eccles *et al.*, 2014). This paradigm shift is particularly pronounced in emerging economies that are heavily reliant on natural resource extraction. While these industries are often the primary drivers of national revenue, they are also associated with significant environmental degradation, social disruption, and governance challenges (Kolstad & Søreide, 2009).

Nigeria represents a compelling case study in this context. As one of Africa's largest economies, its prosperity is inextricably linked to its natural resource sector, predominantly oil and gas. However, this dependence has created a "paradox of plenty," where economic gains are often offset by severe environmental externalities, such as oil spills, gas flaring, and habitat destruction, leading to persistent conflict and social unrest in regions like the Niger Delta (Idemudia, 2010). In this high-stakes environment, firms face intense scrutiny and are under constant pressure to legitimize their operations to a diverse array of stakeholders.

Environmental accounting and its associated disclosures have emerged as a primary mechanism through which firms can manage these pressures. Voluntarily providing information on their environmental policies, performance, and expenditures signals firms' commitment to responsible stewardship, thereby reducing information asymmetry, mitigating perceived risk, and enhancing their social license to operate (Deegan, 2002; Clarkson, Li, Richardson, & Vasvari, 2008). While a substantial body of literature has explored the link between environmental performance and financial performance, the findings remain mixed, and research focusing on the *quality* of disclosure in the specific context of Nigeria's high-risk natural resource sector is limited (see Fabian *et al.*, 2022, for a preliminary study).

This study seeks to fill this gap by addressing a clear and pressing question: Does higher quality environmental accounting disclosure lead to higher firm value for companies in the Nigerian natural resource sector? We argue that in a context characterized by weak institutional enforcement and high stakeholder skepticism, the transparency and comprehensiveness of disclosure act as a credible signal of superior management and lower long-term risk.

Our study makes several contributions. First, we move beyond simple measures of disclosure (e.g., dummy variables) by constructing a nuanced Environmental Disclosure Quality Index (EDQI). Second, we employ a robust panel data fixed-effects model on a sample of 200 firm-year observations, allowing us to control for unobserved firm-specific heterogeneity that may confound results in simpler models. Third, by using Tobin's Q as our measure of firm value, we capture the market's forward-looking assessment of a firm's intangible assets, including its reputation and social license to operate. The findings provide rigorous, context-specific evidence on the financial materiality of non-financial reporting.

The remainder of this paper is structured as follows. The second section develops our theoretical framework and hypothesis; the third details the research design and methodology; the last section presents the empirical results; and the last section

* Corresponding author: assumamba@gmail.com

discusses the findings and their implications, and Section 6 concludes the paper.

Theoretical Framework & Hypothesis Development

Legitimacy Theory

Our primary theoretical lens is Legitimacy Theory. This theory posits that organizations exist within a broader social system and their survival depends on operating within the bounds and norms of that system. Legitimacy is defined as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 574). When a firm's activities are perceived to violate this "social contract," a "legitimacy gap" emerges, threatening its stability, resource access, and survival (Deegan, 2002).

In the context of Nigeria's natural resource sector, firms operate under a perpetual threat of a legitimacy gap due to their inherent environmental impact. To close this gap, firms engage in legitimating activities, with corporate disclosure being a key strategic tool. By disclosing information about their environmental management practices, firms attempt to shape public perception, demonstrate their congruence with societal values, and justify their continued operations (Hooghiemstra, 2000). High-quality, transparent disclosure is argued to be a more effective legitimating strategy than vague or boilerplate statements, as it provides verifiable evidence of a firm's commitment.

Hypothesis Development

From the perspective of financial markets, legitimacy is intrinsically linked to risk and value. A firm with a strong social license to operate faces lower risks of regulatory sanctions, consumer boycotts, and operational disruptions from community opposition (Godfrey *et al.*, 2009). High-quality environmental disclosure serves as a mechanism to reduce information asymmetry between the firm and its investors regarding these non-financial risks (Clarkson *et al.*, 2008).

When a firm provides detailed information on its environmental policies, liabilities, and investments, it lowers investors' uncertainty about potential future costs and demonstrates a proactive approach to risk management. This increased transparency can lead to a lower cost of capital and a higher valuation from investors who reward well-managed, lower-risk firms (Dhaliwal *et al.*, 2011). Conversely, firms with poor or non-existent disclosure may be perceived by the market as hiding negative information, leading to a risk premium and a lower valuation.

Therefore, grounded in Legitimacy Theory, we argue that the market recognizes and rewards the legitimating function of high-quality environmental disclosure. Firms that invest in more comprehensive reporting are perceived as better managed and less risky, which should translate into higher firm value. This leads to our primary hypothesis:

H_1: There is a significant positive relationship between the quality of environmental accounting disclosure and firm value in the Nigerian natural resource sector.

Methodology

Sample Selection

The initial population for this study comprised all firms listed in the natural resource sector (Oil & Gas and Natural Resources) on the Nigerian Exchange Group (NGX) between 2018 and 2022. We selected this five-year period to capture contemporary disclosure practices. The sample was refined based on the following criteria:

1. Firms must have been continuously listed throughout the 2018-2022 period.
2. Firms must have their annual reports and financial statements available in English.
3. Firms must have the necessary data to calculate all variables for the study.

After applying these filters, our final sample consists of a balanced panel of 40 firms over 5 years, yielding 200 firm-year observations.

3.2 Variable Measurement

Dependent Variable: Firm Value (Tobin's Q): Consistent with a large body of corporate finance and accounting literature (e.g., Chung & Pruitt, 1994; Jo & Harjoto, 2011), we measure firm value using Tobin's Q. It is a forward-looking measure that reflects the market's valuation of a firm's tangible and intangible assets. It is calculated as:

Tobin's Q = (Market Value of Equity + Book Value of Total Debt)/Book Value of Total Assets

Independent Variable: Environmental Disclosure Quality Index (EDQI): We measure the quality of environmental disclosure using a comprehensive index (EDQI), adapted from the frameworks of Clarkson *et al.* (2008) and Al-Tuwaijri *et al.*, (2004). We conducted a manual content analysis of the annual reports of each sample firm for each year. The EDQI is constructed as a dichotomous index of 15 items, where a firm receives a score of '1' if an item is disclosed and '0' otherwise. The total EDQI score for each firm-year can range from 0 to 15. The 15 items cover four key dimensions:

1) Governance and Policy (3 items): Disclosure of a formal environmental policy; board-level responsibility for environmental matters; statement of compliance with environmental laws.
2) Environmental Performance (5 items): Quantitative data on greenhouse gas emissions; energy consumption data; water usage data; waste management metrics; details of environmental incidents (e.g., spills).
3) Environmental Expenditures (4 items): Capital expenditure on pollution control; operational costs for environmental management; provisions for environmental liabilities; fines paid for non-compliance.
4) Forward-Looking Information (3 items): Stated targets for future environmental performance; discussion of climate-related risks and opportunities; details of investment in green technology or R&D.

Control Variables: To isolate the effect of the EDQI, we control for other firm characteristics known to influence firm value:

1) *Firm Size (SIZE):* Measured as the natural logarithm of total assets. Larger firms are often more diversified, have greater market power, and are subject to greater scrutiny, all of which can affect value (Dang *et al.*, 2018).
2) *Leverage (LEV):* Measured as total debt divided by total assets. Higher leverage indicates higher financial risk, which is

typically associated with lower firm value (Fama & French, 1992).

3) *Profitability (ROA):* Measured as net income divided by total assets. More profitable firms are naturally expected to have higher valuations.

Econometric Model

To test our hypothesis while controlling for unobserved, time-invariant firm characteristics (e.g., corporate culture, managerial talent), we employ a panel data model with firm fixed effects. The model is specified as follows:

$$Tobin's\ Q_{it} = \beta_0 + \beta_1 EDQI_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + a_i + \gamma_t + \varepsilon_{it}$$

Where:

- i and t index firm and year, respectively.
- Tobin's Q_{it} is the firm value.
- $EDQI_{it}$ is the Environmental Disclosure Quality Index.
- $SIZE_{it}$, LEV_{it}, ROA_{it} are the control variables.
- α_i represents the firm-specific fixed effects.
- γ_t represents the year-fixed effects to control for macroeconomic shocks common to all firms in a given year.
- ε_{it} is the idiosyncratic error term.

A Hausman test was conducted, and its result ($p < 0.01$) confirmed that the fixed-effects model is more appropriate than a random-effects model for our data. Standard errors are clustered at the firm level to account for potential serial correlation.

Results

Manufacturing firms as open systems use resources from a natural system to produce consumer products by the production process (Fiksel *et al.*, 2014).

Hypothesis Development

Descriptive Statistics

Table 1 presents the descriptive statistics for all variables used in the study. The mean Tobin's Q is 1.15, suggesting that, on average, the market values our sample firms slightly above their book value. The EDQI has a mean score of 7.82 out of a possible 15, with a wide range from 2 to 14, indicating significant variation in disclosure quality across the sample. The control variables also show considerable variation.

Table 1: Descriptive Statistics (n = 200)

Variable	Mean	SD	Min	Median	Max
Tobin's Q	1.15	0.58	0.45	1.02	2.98
EDQI	7.82	3.12	2.00	8.00	14.00
SIZE (log Assets)	12.45	1.88	9.10	12.5	16.20
LEV (Debt/Assets)	0.42	0.19	0.11	0.41	0.85
ROA (Return on Assets)	0.06	0.04	-0.05	0.06	0.18

Correlation Analysis

Table 2 provides the Pearson correlation matrix for the variables. As expected, EDQI shows a significant positive correlation with Tobin's Q (r = 0.28, $p < 0.01$), providing preliminary support for our hypothesis. The correlations among the independent variables are all below the common threshold of 0.7, suggesting that multicollinearity is not a significant concern in our model.

Table 2: Pearson Correlation Matrix

	Tobin's Q	EDQI	SIZE	LEV	ROA
Tobin's Q	1				
EDQI	0.281**	1			
SIZE	0.195**	0.410**	1		
LEV	-0.215**	-0.150*	-0.205**	1	
ROA	0.452**	0.221**	0.188**	-0.350**	1

Note: ** Correlation is significant at the 0.01 level. * Correlation is significant at the 0.05 level.

Regression Results

Table 3 presents the results of our main firm fixed-effects regression analysis. The model is statistically significant overall (F-statistic = 18.24, $p < 0.001$) and has a credible explanatory power (R-squared = 0.312).

Table 3: Fixed-Effects Regression Results for Tobin's Q

Variable	β	SE	*t*	*p*
EDQI	0.134	0.051	2.63	0.009
SIZE	0.288	0.112	2.57	0.011
LEV	-0.205	0.088	-2.33	0.021
ROA	0.491	0.160	3.07	0.003
Constant	0.987	0.298	3.31	0.001
Observations	200			
R-squared	0.312			
F-statistic	18.240			0.000
Firm Fixed Effects	Included			
Year Fixed Effects	Included			

Note: Standard errors are clustered at the firm level.

The key finding is that the coefficient for EDQI is positive and highly significant (β = 0.134, $p < 0.01$). This result strongly supports our hypothesis H_1. It indicates that, after controlling for firm size, leverage, profitability, and all time-invariant firm characteristics, a one-point increase in the environmental disclosure quality score is associated with a 0.134 increase in the firm's Tobin's Q.

The control variables perform as expected. Profitability (ROA) and Firm Size (SIZE) have significant positive effects on firm value, while Leverage (LEV) has a significant negative effect.

Robustness Checks

To ensure the robustness of our findings, we conducted two additional tests. First, we re-ran the regression using an alternative proxy for firm value, the Market-to-Book Ratio, and found that the positive and significant effect of EDQI persisted. Second, we tested for a lagged effect by regressing Tobin's Q in year t on EDQI from year t-1. The coefficient remained positive and significant, suggesting that the market's valuation incorporates information from past disclosures.

Discussion

The empirical results provide compelling support for the value relevance of environmental accounting disclosure in the Nigerian natural resource sector. The significant positive coefficient on our disclosure quality index (EDQI) indicates that firms are financially rewarded by the market for greater transparency in their environmental reporting. This finding directly aligns with the central tenets of Legitimacy Theory. In a sector where a firm's social license to operate is perpetually under negotiation, comprehensive disclosure acts as a powerful legitimating strategy. By providing detailed environmental information, firms can reduce stakeholder uncertainty, signal responsible management, and build the trust necessary to secure a higher market valuation.

Our results extend the findings of prior research (e.g., Al-Tuwaijri *et al.*, 2004; Clarkson *et al.*, 2008) to the unique institutional context of an emerging, resource-dependent economy. Unlike in developed markets with strong regulatory frameworks, in Nigeria, voluntary disclosure may serve as an even more critical signal to investors trying to differentiate between well-managed firms and those with hidden environmental risks. The market appears to interpret higher disclosure quality not just as a sign of transparency, but as a proxy for superior underlying environmental performance and risk management.

The significance of the control variables further reinforces the validity of our model. The positive effects of firm size and profitability, and the negative effect of leverage, are consistent with decades of research in corporate finance, lending confidence to our main finding regarding the incremental explanatory power of environmental disclosure

Conclusion

Summary of Findings

This study set out to determine whether higher quality environmental accounting disclosure translates into higher firm value for companies in Nigeria's natural resource sector. Using a robust panel data analysis of 200 firm-year observations, we find a significant and positive relationship between our Environmental Disclosure Quality Index (EDQI) and Tobin's Q. This evidence suggests that the capital market rewards firms for their investment in transparent environmental reporting.

Implications

The findings of this study have several important implications:

1. *For Corporate Managers:* The results provide a clear business case for enhancing environmental disclosure. It should not be viewed as a mere compliance exercise or a public relations tool, but as a strategic activity that can create tangible shareholder value by lowering perceived risk and improving market valuation.
2. *For Investors:* This research underscores the materiality of non-financial, ESG-related information. Investors and analysts should integrate assessments of disclosure quality into their valuation models, as it provides a valuable signal about a firm's long-term sustainability and risk profile.
3. *For Regulators and Policymakers:* The findings suggest that market-based incentives can effectively encourage better corporate environmental behavior. Regulators in Nigeria, such as the Financial Reporting Council and the NGX, should consider strengthening disclosure guidelines and promoting standardized reporting frameworks (such as those from the IFRS Foundation's ISSB) to improve the quality and comparability of environmental information.

Limitations and Avenues for Future Research

While this study employs a rigorous methodology, it has limitations that open avenues for future research. First, our sample is limited to publicly listed firms; future studies could explore disclosure practices in private or state-owned enterprises. Second, while content analysis is a standard method, it is subject to a degree of subjectivity. Third, the potential for endogeneity remains a challenge in all disclosure research—it is possible that higher-value firms simply choose to disclose more. Although our fixed-effects model mitigates this to an extent, future research could employ more advanced econometric techniques (e.g., instrumental variables) to further address causality. Finally, a qualitative study involving interviews with managers and investors could provide a deeper, more nuanced understanding of the motivations behind disclosure and how this information is actually used in investment decisions.

References

Al-Tuwaijri, S. A., Christensen, T. E., & Hughes, K. E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach. *Accounting, Organizations and Society, 29*(5-6), 447-471. https://doi.org/10.1016/S0361-3682(03)00032-1

Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's *q*. *Financial Management, 23*(3), 70-74. https://doi.org/10.2307/3665623

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society, 33*(4-5), 303-327. https://doi.org/10.1016/j.aos.2007.05.003

Dang, C., Li, Z. F., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal of Banking & Finance, 86*, 159-176. https://doi.org/10.1016/j.jbankfin.2017.09.006

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures–a theoretical foundation. *Accounting, Auditing & Accountability Journal, 15*(3), 282-311. https://doi.org/10.1108/09513570210435852

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review, 86*(1), 59-100. https://doi.org/10.2308/accr.00000005

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science, 60*(11), 2835-2857. https://doi.org/10.1287/mnsc.2014.1984

Fabian, O., Onuora, J. K. J., & Obianuju, O. (2022). Environmental accounting practices, social responsibility disclosures and firm value; Evidence from listed oil and gas firms in Nigeria. *IIARD International Journal of Economics and Business Management, 8*(1), 29-40.

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance, 47*(2), 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal, 30*(4), 425-445. https://doi.org/10.1002/smj.750

Hooghiemstra, R. (2000). Corporate communication and impression management–new perspectives why companies engage in corporate social reporting. *Journal of Business Ethics, 27*(1), 55-68. https://doi.org/10.1023/A:1006400707757

Idemudia, U. (2010). Corporate social responsibility and the rentier Nigerian state: Rethinking the role of government and the possibility

of corporate social development in the Niger Delta. *Canadian Journal of Development Studies/Revue canadienne d'études du développement*, *30*(1-2), 131-151. https://doi.org/10.1080/02255189.2010.9669285

Jo, H., & Harjoto, M. A. (2011). Corporate governance and firm value: The impact of corporate social responsibility. *Journal of Business Ethics, 103*(3), 351-383. https://doi.org/10.1007/s10551-011-0866-y

Kolstad, I., & Søreide, T. (2009). Corruption in natural resource management: Implications for policy makers. *Resources Policy, 34*(4), 214-226. https://doi.org/10.1016/j.resourpol.2009.05.001

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review, 20*(3), 571-610. https://doi.org/10.5465/amr.1995.9508080331