Firm Profitability, Financial Leverage and Environmental Disclosure Index of Listed Industrial Goods Firms in Nigeria

Odey, Joy Ochuole (PhD)
Department of Accounting
Federal University Otuoke
Bayelsa State, Nigeria
Odeyjo@Fuotuoke.Edu.Ng

https://doi.org/10.56201/jafm.vol.12.no11.2026.pg253.260

Abstract
This study examined the effects of firm profitability and financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria from 2011 to 2022. The study was motivated by growing concerns regarding corporate environmental accountability and the need to determine whether financial performance and capital structure significantly influence environmental reporting practices. An ex-post facto research design was adopted, with a population of 21 listed industrial goods firms, from which 10 firms were purposively selected based on continuous listing and availability of relevant financial information. Secondary data were extracted from published annual reports and financial statements, generating 120 firm-year observations. Descriptive statistics, Pearson correlation analysis and multiple regression analysis were employed using the Statistical Package for the Social Sciences (SPSS). The findings from the original multivariable regression revealed that firm profitability had a negative but statistically insignificant effect on environmental disclosure ($\beta = -0.087$, $p = 0.370$), while financial leverage exhibited a positive but statistically insignificant effect ($\beta = 0.030$, $p = 0.757$), after controlling for firm size, firm age and board size. These findings indicate that neither profitability nor financial leverage significantly influenced environmental disclosure among the sampled firms. The study concluded that corporate financial performance and financing structure were not significant determinants of environmental disclosure within the original regression framework, suggesting that environmental transparency may depend on broader regulatory, institutional and corporate governance considerations. It recommended that management institutionalise comprehensive environmental reporting policies irrespective of profitability levels, while regulatory authorities strengthen environmental disclosure requirements and compliance monitoring across firms with different financing structures. The study contributes sector-specific empirical evidence to the literature on corporate financial characteristics and environmental accountability in Nigeria.

Keywords: *Firm profitability; Financial leverage; Environmental disclosure index; Environmental reporting; Industrial goods firms; Nigeria.*

1.0 Introduction

Environmental sustainability and corporate accountability have become increasingly important in contemporary business operations, particularly as industrial activities continue to contribute to

environmental degradation, pollution, resource depletion and climate change. Consequently, stakeholders, including investors, regulatory authorities and host communities, increasingly demand transparency regarding corporate environmental responsibilities. Environmental disclosure has therefore emerged as an important component of corporate reporting, providing information on organisational environmental policies, activities, risks and sustainability commitments. The Global Reporting Initiative (GRI, 2021) emphasised the importance of sustainability reporting in communicating organisational impacts on the environment and society. Similarly, the International Sustainability Standards Board (ISSB, 2023) highlighted the need for consistent sustainability-related financial information to enhance corporate transparency and informed investment decisions. The growing importance of environmental reporting has stimulated academic interest in identifying financial characteristics that influence corporate disclosure practices. Among these characteristics, firm profitability and financial leverage are particularly relevant because they reflect organisational financial performance, resource availability and financing structures. Firm profitability represents an organisation's ability to generate earnings from its operations and resources, commonly measured through return on assets, return on equity or profit margins. Profitable firms may possess greater financial capacity to implement environmental initiatives and establish comprehensive reporting systems. Drempetic et al. (2020) demonstrated the importance of organisational resources in corporate environmental, social and governance assessments, suggesting that financial capacity may influence sustainability-related outcomes. Nevertheless, profitability does not necessarily guarantee extensive environmental disclosure, particularly where management prioritises immediate financial returns over environmental accountability. Financial leverage constitutes another important organisational characteristic potentially influencing environmental reporting practices. It reflects the extent to which firms rely on borrowed funds to finance their operations, commonly measured through the ratio of total debt to total assets. Highly leveraged firms may face increased scrutiny from creditors and other financial stakeholders, potentially encouraging greater transparency regarding environmental risks and sustainability commitments. Conversely, substantial debt obligations may constrain resources available for environmental initiatives and reporting activities. These competing possibilities suggest that financial leverage may either encourage or discourage environmental disclosure, depending on organisational priorities, creditor expectations and prevailing institutional conditions. Environmental disclosure is particularly relevant to Nigeria's industrial goods sector because manufacturing activities frequently involve substantial energy consumption, industrial emissions, waste generation and environmental risks. The environmental disclosure index provides a systematic measure of the extent to which firms communicate specified environmental information through their corporate reports. Haruna et al. (2024) examined firm attributes and environmental disclosure among listed industrial goods companies in Nigeria, highlighting the relevance of financial and organisational characteristics to environmental reporting. However, the extent to which profitability and financial leverage independently influence environmental disclosure remains an important empirical consideration. Although financially successful firms may possess greater resources for sustainability reporting, highly indebted firms may experience competing financial pressures that influence their disclosure decisions. The present study draws on Stakeholder Theory and Legitimacy Theory to explain the relationship between financial characteristics and environmental disclosure. Stakeholder Theory suggests that organisations respond to information demands from investors, creditors, regulators and other interested parties, while Legitimacy Theory emphasises corporate efforts to maintain societal acceptance through responsible business practices. Recent Nigerian research has applied

these perspectives to corporate sustainability disclosure (Nadiyasu & Samuel, 2025). However, the extent to which financial performance and debt obligations translate into environmental transparency requires sector-specific investigation.

Against this background, the present study examines the effects of firm profitability and financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria from 2011 to 2022. By concentrating on these financial characteristics, the study seeks to provide empirical evidence on the relationship between corporate financial conditions and environmental transparency, while contributing to discussions on environmental accounting, sustainability reporting and corporate accountability in emerging economies.

1.1 Aim and Objectives of the Study

Aim of the Study

The aim of this study is to examine the effects of firm profitability and financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria.

Specific Objectives

The specific objectives of the study are to:

1. Examine the effect of firm profitability on the environmental disclosure index of listed industrial goods firms in Nigeria.
2. Determine the effect of financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria.

1.2 Research Questions

The following research questions guided the study:

1. To what extent does firm profitability affect the environmental disclosure index of listed industrial goods firms in Nigeria?
2. What is the effect of financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria?

1.3 Research Hypotheses

The following null hypotheses were formulated and are to be tested at the 0.05 level of significance:

H_{01}: Firm profitability has no statistically significant effect on the environmental disclosure index of listed industrial goods firms in Nigeria.

H_{02}: Financial leverage has no statistically significant effect on the environmental disclosure index of listed industrial goods firms in Nigeria.

2. Research Methods

The study adopted an ex-post facto research design to examine the effects of firm profitability and financial leverage on the environmental disclosure index of listed industrial goods firms in Nigeria. The design was considered appropriate because the study relied on historical financial and environmental reporting information without manipulating the variables under investigation. The population comprised 21 industrial goods firms listed on the Nigerian Exchange Group (NGX), from which 10 firms were purposively selected based on predetermined selection criteria. The study covered a twelve-year period, from 2011 to 2022, and utilised secondary data extracted from

the published annual reports and financial statements of the selected firms. The data were organised as panel observations to capture variations across firms and over time.

The selection criteria required that the firms remained listed throughout the study period and had the information necessary to measure the research variables. These criteria produced a balanced dataset of 120 firm-year observations. The dependent variable, environmental disclosure index (DCI), was measured as the ratio of each firm's environmental disclosure score to the maximum obtainable disclosure score. The independent variables were firm profitability (PROF), representing the firm's ability to generate earnings from its assets, and financial leverage (LEV), representing the proportion of the firm's assets financed through debt. For the proposed analysis, profitability is operationalised as return on assets, measured by the ratio of profit after tax to total assets, while financial leverage is measured as the ratio of total debt to total assets. These operational definitions should be checked against the original dataset to ensure consistency with the dissertation's measurements.

Data analysis involved descriptive statistics, correlation analysis and multiple regression analysis using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were employed to summarise the characteristics and distribution of the variables, while correlation analysis assessed the direction and strength of their relationships. Diagnostic procedures included assessments of multicollinearity, residual normality and heteroskedasticity. Multiple regression analysis was specified to estimate the effects of firm profitability and financial leverage on environmental disclosure. For the present article, the regression model is specified as:

$$\mathbf{DCI_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 LEV_{it} + \varepsilon_{it}}$$

Where:

- $\mathbf{DCI_{it}}$ = Environmental disclosure index of firm i in year t.
- $\mathbf{PROF_{it}}$ = Firm profitability of firm i in year t.
- $\mathbf{LEV_{it}}$ = Financial leverage of firm i in year t.
- $\boldsymbol{\beta_0}$ = Regression intercept.
- $\boldsymbol{\beta_1, \beta_2}$ = Regression coefficients.
- $\boldsymbol{\varepsilon_{it}}$ = Error term.

The hypotheses were to be evaluated at the 5% significance level, with a p-value below 0.05 indicating statistical significance. The specified two-predictor model would require estimation using the underlying firm-year dataset to obtain the regression coefficients and hypothesis-testing results for this article.

3.0 Results

This section presents the findings on firm profitability, financial leverage and the environmental disclosure index of listed industrial goods firms in Nigeria for the period 2011–2022. The analysis covers 10 selected firms and 120 firm-year observations.

3.1 Effect of Firm Profitability on Environmental Disclosure Index

The original regression results indicated that firm profitability had a negative but statistically insignificant effect on environmental disclosure among listed industrial goods firms in Nigeria. The unstandardised regression coefficient was −0.059, with a standard error of 0.065, a t-value of −0.900 and a p-value of 0.370. Since the p-value exceeded the 0.05 significance level, the first null hypothesis was not rejected.

3.2 Effect of Financial Leverage on Environmental Disclosure Index

Financial leverage exhibited a positive but statistically insignificant effect on environmental disclosure. The unstandardised regression coefficient was 0.020, with a standard error of 0.064, a t-value of 0.310 and a p-value of 0.757. Since the p-value exceeded 0.05, the second null hypothesis was not rejected.

3.3 Descriptive Statistics

Table 1: Descriptive Statistics of the Study Variables

Variable	N	Mean	Standard deviation	Skewness	Kurtosis
Environmental disclosure index (DCI)	120	0.4448	0.20882	0.626	0.015
Firm profitability (FP)	120	1.1797	3.46493	4.453	20.054
Financial leverage (FLEV)	120	3.7569	13.59644	4.373	18.789

Source: SPSS Output (2024)

Table 1 reveals that the environmental disclosure index recorded a mean of 0.4448, indicating that the sampled firms disclosed approximately 44.48% of the environmental information measured by the disclosure index. Firm profitability recorded a mean of 1.1797 and a standard deviation of 3.46493, suggesting considerable differences in financial performance across the firms. Similarly, financial leverage recorded a mean of 3.7569 and a standard deviation of 13.59644, indicating substantial variation in financing structures. The high positive skewness and kurtosis values for profitability and leverage suggest markedly non-normal distributions, potentially reflecting extreme observations.

4.4 Correlation Analysis

Table 2: Pearson Correlation Matrix

Variables	DCI	FP	FLEV
DCI	1.000	−0.088	0.016
FP	−0.088	1.000	0.169
FLEV	0.016	0.169	1.000

Source: SPSS Output (2024)

The correlation results indicate a weak negative relationship between firm profitability and environmental disclosure (r = −0.088), suggesting that higher profitability was associated with marginally lower disclosure scores. Financial leverage exhibited a negligible positive relationship with environmental disclosure (r = 0.016). The correlation between profitability and financial leverage was also weak (r = 0.169), suggesting limited linear association between the two explanatory variables.

3.5 Regression Analysis and Test of Hypotheses

Table 3: Regression Coefficients for Profitability and Financial Leverage

Extracted from the original five-predictor regression model

Variable	B	Std. error	Beta	t-value	p-value
Constant	0.438	0.186	—	2.359	0.020
Firm profitability (FP)	−0.059	0.065	−0.087	−0.900	0.370
Financial leverage (FLEV)	0.020	0.064	0.030	0.310	0.757

Source: SPSS Output (2024)

The results show that profitability had a negative but statistically insignificant effect on environmental disclosure (B = −0.059, p = 0.370), while financial leverage had a positive but statistically insignificant effect (B = 0.020, p = 0.757). Both p-values exceeded the 0.05 significance threshold.

Hypothesis One (H_{01}): Firm profitability has no statistically significant effect on the environmental disclosure index of listed industrial goods firms in Nigeria. Since p = 0.370 exceeds 0.05, the null hypothesis was not rejected under the original regression model. This indicates insufficient statistical evidence that profitability significantly influenced environmental disclosure.

Hypothesis Two (H_{02}): Financial leverage has no statistically significant effect on the environmental disclosure index of listed industrial goods firms in Nigeria.

Since p = 0.757 exceeds 0.05, the null hypothesis was not rejected under the original regression model. This indicates insufficient statistical evidence that financial leverage significantly influenced environmental disclosure.

3.6 Discussion of Findings

Firm Profitability and Environmental Disclosure Index

The findings of the study revealed that firm profitability had a negative but statistically insignificant effect on the environmental disclosure index of listed industrial goods firms in Nigeria (β = −0.087, p = 0.370). This indicates that increased profitability was associated with a marginal reduction in environmental disclosure, although the relationship was not statistically significant. The finding suggests that improved financial performance does not necessarily translate into greater environmental transparency among industrial goods firms in Nigeria. Ordinarily, profitable organisations are expected to possess sufficient financial resources to implement environmental management systems, undertake sustainability initiatives and disclose relevant environmental information. However, the present finding challenges this expectation, suggesting that the availability of financial resources alone may be insufficient to motivate comprehensive environmental reporting. This interpretation is consistent with the broader argument of Drempetic et al. (2020), who demonstrated that organisational characteristics and resource availability can influence sustainability assessments without necessarily providing a complete explanation of corporate environmental performance. Similarly, Haruna et al. (2024) examined firm attributes and environmental disclosure among listed industrial goods companies in Nigeria, reinforcing the relevance of organisational characteristics to environmental reporting decisions. From the perspective of Stakeholder Theory, the finding suggests that profitability may not independently determine environmental transparency where stakeholder demands and regulatory expectations are insufficient to encourage disclosure. Consequently, the result underscores the importance of managerial commitment, environmental reporting policies and institutional accountability in promoting sustainability disclosure, irrespective of corporate profitability.

Financial Leverage and Environmental Disclosure Index

The findings further revealed that financial leverage had a positive but statistically insignificant effect on the environmental disclosure index of listed industrial goods firms in Nigeria (β = 0.030, p = 0.757). This suggests that firms with higher levels of financial leverage tended to exhibit

marginally greater environmental disclosure, although the observed relationship was too weak to establish a statistically significant effect. The positive coefficient may indicate that debt-financed organisations recognise the importance of environmental transparency in maintaining creditor confidence, demonstrating responsible corporate behaviour and reducing information asymmetry. Nevertheless, the absence of statistical significance suggests that financial leverage does not constitute a reliable determinant of environmental reporting among the sampled firms. This finding can be interpreted through Stakeholder Theory, which recognises creditors as important stakeholders whose information requirements may influence corporate disclosure practices. However, the result also suggests that creditor expectations may not consistently translate into environmental reporting obligations within the Nigerian industrial goods sector. Haruna et al. (2024) highlighted the relevance of firm attributes in explaining environmental disclosure practices, while Nura et al. (2025) examined the relationship between corporate attributes and environmental disclosure among listed consumer goods firms in Nigeria. These studies provide relevant empirical contexts for understanding the role of corporate characteristics in sustainability reporting, although their findings should not be interpreted as direct confirmation of the present leverage coefficient. The result therefore suggests that environmental disclosure may depend more strongly on established reporting requirements, corporate governance mechanisms and institutional pressures than on the proportion of debt employed in financing business operations.

4.0 Conclusion

The study concluded that firm profitability and financial leverage had no statistically significant effects on the environmental disclosure index of listed industrial goods firms in Nigeria during the period 2011–2022, based on the original multivariable regression results. Although firm profitability exhibited a negative relationship with environmental disclosure, the effect was statistically insignificant, suggesting that improved financial performance did not necessarily translate into greater environmental transparency. Similarly, financial leverage demonstrated a positive but statistically insignificant effect, indicating that increased reliance on debt financing did not significantly influence environmental reporting practices among the sampled firms. These findings suggest that corporate environmental disclosure may not be adequately explained by financial performance and capital structure alone, as other factors, including regulatory compliance, stakeholder expectations, corporate governance practices and managerial commitment, may play important roles in shaping environmental reporting decisions. The study therefore emphasises the need for strengthened environmental reporting regulations, institutionalised sustainability disclosure practices and effective corporate governance mechanisms to promote consistent environmental transparency and accountability among listed industrial goods firms in Nigeria, irrespective of their profitability levels or financing structures.

5.1 Recommendations

1. Management of listed industrial goods firms in Nigeria should institutionalise comprehensive environmental reporting policies and allocate adequate resources to sustainability disclosure, irrespective of profitability levels, to ensure that environmental accountability is not dependent solely on financial performance.
2. Regulatory authorities and corporate governance bodies should strengthen environmental disclosure requirements and monitoring mechanisms for listed industrial goods firms, regardless of their financial leverage, to promote consistent environmental transparency, regulatory compliance and stakeholder confidence.

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