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Effect of Sustainable Firms' Characteristics on the Environmental Disclosure among Nigerian Firms

Nwabuisi, Anthony Okorie¹, Ozioko, Chigozie Blessing PhD², and Ani, Thomas Maduabuchi³

¹Department of Accountancy, Enugu State University of Science and Technology, Enugu, Nigeria

²Department of Accountancy, University of Nigeria, Enugu Campus, Nigeria

³Department of Accounting, Southwestern University, Nigeria, Okun-Owa, Ogun State. Nigeria

*Corresponding Author

Background

In recent decades, sustainability has evolved from a peripheral concern to a core business imperative, reflecting growing recognition of the interconnectedness between economic performance, environmental stewardship, and social responsibility. Firms that embrace sustainability are increasingly regarded not merely as contributors to profit maximization but as vital actors in shaping inclusive growth and long-term societal well-being (Lüdeke-Freund et al., 2020). The concept of sustainable firms' rests on the "triple bottom line" (TBL) framework balancing financial viability, social responsibility, and environmental protection (Elkington, 2018). Within this paradigm, the characteristics of sustainable firms go beyond compliance with regulations to encompass broader values such as accountability, resilience, innovation, and stakeholder inclusiveness (Dyllick & Muff, 2016; Eccles & Klimenko, 2019).

Sustainable firms are typically distinguished by a set of organizational attributes and management practices designed to ensure that operations create long-term value without depleting natural, social, or human capital. Some key characteristics include: strong corporate governance structures that integrate sustainability into decision-making; transparent reporting guided by global standards such as GRI or SASB; responsible resource utilization and circular economy practices; diversity and equity in workforce policies; and long-term stakeholder engagement that prioritizes value creation for communities, customers, and investors alike (Fernando & Lawrence, 2021; Schaltegger et al., 2022). In addition, sustainable firms often exhibit strategic resilience the capacity to adapt to uncertainties such as climate change, supply chain shocks, or rapidly shifting consumer preferences (García-Sánchez et al., 2020).

Environmental disclosure, the act of revealing environment-related information to the public, has become a critical component of corporate governance and sustainability. It enables stakeholders to assess a company's environmental performance, understand its sustainability initiatives, and make informed decisions. The quality and extent of this disclosure are often measured using an Environmental Disclosure Index (EDI), which serves as a benchmark for evaluating corporate environmental transparency.

ABSTRACT

This study investigates the effect of sustainable firms' characteristics on the Environmental Disclosure Index among Nigerian firms, with particular emphasis on firm size and firm age. An ex-post facto research design was employed, utilizing secondary data extracted from the annual reports and accounts of manufacturing firms listed on the Nigerian Exchange Group. The dataset consists of panel observations and was analyzed using Stata 14.2. Descriptive statistics, Fisher-type unit root tests, correlation analysis, and model specification diagnostics were conducted to validate the suitability of the data and the regression model. Hypotheses were tested using a Prais-Winsten regression with panel-corrected standard errors to address heteroscedasticity and serial correlation inherent in panel data. The results indicate that firm size has a positive and statistically significant effect on the Environmental Disclosure Index, implying that larger firms are more likely to engage in comprehensive environmental disclosure. Conversely, firm age exhibits an insignificant effect on environmental disclosure, suggesting that longevity does not necessarily translate into improved environmental reporting practices. The study concludes that sustainable firms' characteristics affect environmental disclosure in a selective manner, with firm size emerging as the dominant explanatory factor. It therefore recommends that policymakers and relevant stakeholders focus on capacity-building measures that enable smaller firms to enhance their environmental disclosure practices, thereby strengthening transparency and sustainability within the Nigerian corporate sector.

Keywords: Sustainable Firms' Characteristics; Environmental Disclosure; Nigerian Firms; Firm Size; Firm Age

Citation: Nwabuisi, A. O., Ozioko, C. B. & Ani, T. M. (2025). Effect of Sustainable Firms' Characteristics on the Environmental Disclosure among Nigerian Firms. *European Journal of Finance and Management Sciences* 9(2), 23-33. DOI: <https://doi.org/10.5281/zenodo.18148861>

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Empirical evidence increasingly suggests that sustainability-oriented firms outperform their non-sustainable peers in terms of long-term resilience, innovation capacity, and risk management. Studies show, for example, that companies prioritizing sustainability metrics attract higher investor confidence, gain reputational capital, and benefit from consumer loyalty in an era of heightened environmental and social awareness (Kotsantonis & Pinney, 2022; Friede et al., 2021). Moreover, sustainable firm characteristics are not uniform they vary across contexts, industries, and regions, influenced by regulatory frameworks, cultural values, and stakeholder pressures (Bennett et al., 2021).

In emerging economies such as Nigeria and other Sub-Saharan African nations, fostering sustainable firms is particularly critical given the dual challenge of economic development and environmental degradation. Here, characteristics such as ethical leadership, corporate social responsibility, effective stakeholder dialogues, and innovation-led practices play significant roles in differentiating firms that contribute to development from those that undermine it through unsustainable exploitation of resources (Okafor & Adeleye, 2022).

Firm characteristics, encompassing attributes such as size, age, profitability, leverage, and organizational culture, are theorized to significantly influence a company's environmental disclosure practices. Sustainable firms, distinguished by their commitment to environmental stewardship and sustainable business practices, may exhibit distinct characteristics that drive higher levels of environmental disclosure. Understanding how these characteristics affect the EDI of quoted manufacturing firms in Nigeria is crucial for promoting sustainable business practices and enhancing corporate accountability.

This study, therefore, aims to investigate the effect of sustainable firms' characteristics on the Environmental Disclosure Index of quoted manufacturing firms in Nigeria. By examining the interplay between firm attributes and environmental reporting, this research seeks to provide insights that can inform policy recommendations, guide corporate strategies, and contribute to the broader discourse on sustainable development in Nigeria.

Statement of the Problem

In recent years, the importance of environmental sustainability has surged, with stakeholders increasingly demanding transparency regarding firms' environmental practices. In Nigeria, the manufacturing sector plays a pivotal role in the economy, yet it is also associated with significant environmental challenges, including pollution and resource depletion. Despite the growing emphasis on environmental disclosure, many quoted manufacturing firms in Nigeria exhibit varying degrees of transparency in their sustainability reporting.

This variation raises critical questions about the underlying factors influencing environmental disclosure practices. Firm characteristics, such as size, age, profitability, organizational culture, and commitment to sustainability, may significantly impact the Environmental Disclosure Index (EDI) of these companies. However, there is a lack of empirical research examining how these sustainable firm attributes specifically affect the EDI in the Nigerian context.

The existing literature predominantly focuses on developed economies, leaving a gap in understanding the unique dynamics at play in Nigeria's manufacturing sector. Furthermore, the consequences of inadequate environmental disclosure can be profound, potentially leading to regulatory penalties, reputational damage, and diminished investor confidence. Therefore, this study seeks to investigate the effect of sustainable firms' characteristics on the Environmental Disclosure Index of quoted manufacturing firms in Nigeria, aiming to provide insights that can inform policy, enhance corporate accountability, and promote sustainable business practices within the sector.

Objectives of the Study

The main objective of this study is to examine the effect of Sustainable Firms' Characteristics on the Environmental Disclosure Index among Nigerian Firms. The specific objectives are to;

- i. Assess the effect of firm size on environmental disclosure index of quoted manufacturing firms in Nigeria.
- ii. Investigate the effect of firm age on environmental disclosure index among Nigerian Firms.

Statement of Hypotheses

- i. Firm size has no significant effect on the environmental disclosure index among Nigerian Firms.
- ii. Firm age has no significant effect on the environmental disclosure index among Nigerian Firms.

Review of Related Literature

Conceptual Review

Sustainable Firms' Characteristics

According to Porter and Kramer (2011), sustainable enterprises are those that consciously plan their operations, strategy, and reporting to provide long-term value for shareholders and other stakeholders, such as workers, communities, and the environment. Stakeholder orientation, resource-sensitive adoption patterns, integrated governance, ESG-focused innovation, sustainable dynamic capacities, rigorous measurement and transparency, and a clear correlation between sustainability and financial performance are characteristics of sustainable businesses. These attributes work together: governance makes measurement possible; measurement informs dynamic capabilities; capabilities operationalize innovation; and innovation contributes to stakeholder legitimacy and corporate value (Gold et al., 2022).

Business success here is usually characterized by a methodical alignment of stakeholder involvement, value proposition, and mission. Comprehensive sustainability policies are typically adopted earlier by large organizations, those with more financial slack, better intellectual capital, or more diversified operations than by their smaller or resource-constrained counterparts (Gold et al., 2022). The relationship is complex, though, as SMEs might adopt digital tools that lower transaction costs, form cooperative networks, or focus on specialty methods to have a high sustainability effect. Additionally, social integration and stakeholder orientation are traits of sustainable businesses. Businesses experience quantifiable increases in profitability, value, and risk reduction when sustainability initiatives are linked to specific financial KPIs, capital allocation choices, and remuneration (Aydoğmuş, 2022).

Firm Size

Several factors have been used to evaluate the size of a company, including market capitalization, total assets, total revenues, board size, staff count, and shareholdings (Hasan & Hosian, 2015). They said that a company's size is a major factor in determining the degree and scope of corporate transparency. According to Abdul et al. (2017), tiny businesses may often encounter more valid problems than large organizations in sensitive industries, which are exposed to the public. Islam et al. (2020) and Akhter et al. (2022) claimed that because larger companies have access to more resources, they are better able to meet social demands; as a result, their operations are seen as being of more public interest.

The activities of larger companies are also subject to more public scrutiny, assessment, and analysis than those of smaller companies since they involve activities that have a greater potential to affect society. Compared to smaller businesses, large corporations with greater societal presence may have assumed greater legitimacy, have a better reputation, and are more involved in social responsibility. In order to strengthen their operations, demonstrate greater accountability, and gain societal approval, Benjamin et al. (2017) and Ahkter et al. (2022) used legitimacy theory to support their claims that society expects larger firms to disclose more social and environmental information about their operations than smaller firms do. According to Hasan and Hosian (2021), larger companies have greater resources, which allows them to absorb the costs of producing specific information and disseminating it to different stakeholders.

Firm Age

The duration of a company's existence since its founding or incorporation is referred to as its "firm age." It is commonly measured in research and practice as the number of years that have passed since the date of incorporation (or registration) to the current year (Coad, 2018). Loderer and Waelchli (2010) claim that firm age refers to how long a company has been in business up to this point. Since it is generally accepted that experience is valued in proportion to the duration of operation, a company's age may offer a useful indicator of its sustainability. Additionally, Hassan and Hosain (2021) noted that larger organizations are more likely than younger ones to reveal corporate matters in their annual reports because of their experience and desire to preserve their market image. As a result, they think there should be a substantial correlation between the firm's age and the degree and scope of its required and voluntary disclosure.

Juhmani (2014) asserted that a firm's ability to survive is mostly determined by how it interacts with its immediate surroundings, taking into account both the direct contributions made by the firm to the community and the impact

that its operations have on the community. Older companies are thought to have more positive and long-lasting links with society than younger ones. According to Rapeepun (2018), a company's CSR efforts are anticipated to grow in tandem with its organizational age. Older companies are therefore expected to provide more substantial declarations about social sustainability than younger companies.

Environmental Disclosure Index

A checklist or ranking system of disclosure items known as the Environmental Disclosure Index measures how much a business discloses about its environmental performance, policies, and impacts (Cormier & Magnan, 2015). A score based on content analysis, the Environmental Disclosure Index (EDI) determines whether a company publishes certain environmental information (such as greenhouse gas emissions, energy use, waste management, environmental targets, and climate risk governance). Measuring corporate accountability and transparency on environmental issues, assisting stakeholders (investors, regulators, NGOs, and communities) in assessing a company's environmental responsibility, and comparing companies, sectors, or nations in terms of sustainability reporting practices are the main goals (Muneer, 2024).

Although it is helpful and repeatable, the presence of items (number) is not a guarantee of accuracy or content in many EDIs. The EDI performs a variety of analytical and useful functions. According to Almaqtari et al. (2023), EDIs are independent variables used in academia to test theories on factors that influence disclosure (such as ownership, board composition, company size, and industry pressure), mediators of environmental performance, or results (such as capital expenditures, firm value, and reputation). Practically, EDIs help organizations align reporting with jurisdictional regulations (such as the EU's Corporate Sustainability Reporting Directive) or frameworks like the Global Reporting Initiative (GRI) by providing a thorough summary of disclosure to investors and stakeholders. According to recent industry surveys, sustainability reporting has increased significantly, as has alignment with standardized frameworks. These developments extend the range of disclosures that can be indexed and improve the comparability of EDI metrics (KPMG, 2024).

Theoretical Review

Resource-Based View (RBV)

The RBV, first proposed by Barney in 1991, asserts that businesses can maintain a competitive edge when they have resources that are rare, valuable, unique, and non-replaceable (VRIN). This theoretical perspective shifts the focus from industry structure and external market factors to the internal heterogeneity of businesses as the main factor influencing long-term success. When analyzed in light of company size, the RBV provides detailed information about how organizational scope and scale affect resource endowment, deployment, and strategic results. They can take advantage of economies of scale, make significant investments, and use resource barriers to defend their positions thanks to these advantages (D'Oria et al., 2021).

Resource-based advantage and business size have a conditional relationship. Smaller companies frequently demonstrate better agility in resource reconfiguration and environmental reactivity, whereas larger organizations may excel in resource acquisition and the creation of complex organizational processes (Kero, 2023). According to Gerhart (2021), this implies that the performance implications of firm size depend on environmental volatility. While agility provides better results in turbulent and innovation-driven environments, scale tends to confer advantage in stable or capital-intensive contexts, and the contribution of human capital to competitive advantage depends on the scale at which firms can formalize and exploit knowledge-based resources.

Liability of Obsolescence (or Aging) Theory

According to the Aging theory, an organization's future performance and survival may be hampered by structural inertia, environmental misalignment, and deteriorating adaptability as it ages (Ushijima, 2021). This idea builds on the "liability of newness" that Stinchcombe first proposed in 1965, highlighting the fact that while new businesses have early difficulties, established businesses confront unique issues as they develop. Organizations develop routines, structures, and practices that, although initially advantageous, may become antiquated or out of step with changing external environments as they age, according to the theory. As a result, businesses must actively manage their aging processes by promoting creativity, promoting adaptability, and routinely reviewing their structures and practices (Ushijima, 2021).

Srivastava and Srivastava (2023) also emphasized the "liability of senescence," pointing out that an organization's ability to innovate and respond may deteriorate as it ages because of ingrained traditions and a dwindling capacity for renewal. By highlighting the necessity of ongoing adaptation and learning, this idea highlights the possible drawbacks of aging. Older businesses are more susceptible to shifting external circumstances, according to Kücher (2020), because their collected resources and talents may lose value with time. According to Amankwah-Amoah (2016), bureaucratic processes and a lack of flexibility cause established businesses to experience increased cost pressures and decreased profitability.

Empirical Reviews

Abubakar (2017) looked at how business attributes affected the environmental disclosure of five breweries that were listed between 2012 and 2016 on the Nigerian stock exchange floor. Firm size, profitability, leverage, and board size were utilized in the study to gauge the qualities of the firms, and environmental disclosure was measured through content analysis of the environmental index score. To analyze the data, multiple regression techniques were used. According to the study, environmental disclosure is negatively and significantly impacted by board size, while it is negatively and negligibly impacted by leverage. Profitability has a positive, large impact on the environmental disclosure of Nigerian listed beer businesses, while firm size has a positive, negligible impact.

A study conducted by Shuaibu (2020) examined how business factors affected the level of environmental disclosure among Nigerian cement companies that were listed. Firm size, firm age, and leverage were utilized as stand-ins for firm characteristics in this study. The Global Reporting Initiative (GRI) index was used to evaluate the quality of disclosure. Content analysis was used to gather information from the 2013 to 2017 annual reports and accounts. Using STATA 12.0, multiple regression, correlation, and descriptive statistics were performed. The results showed that these companies' environmental disclosure quality is highly and significantly influenced by firm size, company age, and leverage.

Prot et al. (2021) examined the relationship between business characteristics and environmental disclosure in a Tanzanian extractive industry using a Random Effects General Least Squares (GLS) regression model and longitudinal data taken from yearly reports. 18 businesses that complied with the Tanzania Extractive Industry Transparency Initiative's (TEITI) 2004–2018 standards were included in the study's sample. The study specifically examined how the environmental disclosure index, which is determined using GRI principles, was impacted by the firm's age, size, audit type, capital structure, profitability, and ownership structure. The findings demonstrate that important variables that favorably affect environmental disclosure include firm age, firm size, capital structure, and firm and ownership structure. This suggests that companies with more blocks of shareholders, those that are larger, older, and heavily leveraged, reveal more environmental information. However, it appears that environmental disclosure is not greatly impacted by audit type or business profitability variables.

Adekanmi (2022) investigated how the firm's characteristics affected the sustainability reporting of non-financial companies that were listed between 2006 and 2020 on the Nigerian Exchange Group (NGX). In this study, 76 listed non-financial companies were sampled. For the data analysis, multiple panel data regression (OLS) was used. Sustainability reporting was the main variable, while the independent and control factors were return on assets, firm size, firm age, growth rate, financial leverage, liquidity ratio, free cash flow, business risk, and asset tangibility. The findings demonstrated that, among non-financial firms listed on the NGX, sustainability reporting was positively but not significantly impacted by growth rate, financial leverage, free cash flow, and business risk; profitability, firm size, and liquidity exerted positive and statistically significant relationships with sustainability reporting; and assets tangibility had a negative and statistically significant relationship with sustainability reporting.

Methodology

The study adopts an ex-post facto research design, which is appropriate for examining relationships among variables using historical data that are not subject to manipulation by the researcher. Secondary data were obtained from the published annual reports and accounts of manufacturing firms listed on the Nigerian Exchange Group (NGX). The resulting dataset comprises 504 firm-year observations, forming a panel structure suitable for longitudinal analysis.

The Environmental Disclosure Index (edi) serves as the dependent variable and is measured using a disclosure scoring approach derived from firms' reported environmental information. The key explanatory variables are firm size and firm age, measured as the natural logarithm of firm size ($\ln f_z$) and the natural logarithm of firm age ($\ln f_a$),

respectively. Control variables include foreign association (fa) and board composition (bc), incorporated to account for firm-specific governance influences on environmental disclosure.

Data analysis was conducted using STATA 14.2 for preliminary statistical diagnostics. Descriptive statistics were first employed to summarize the central tendency, dispersion, and range of the variables, providing insight into the distributional characteristics of the dataset. This step ensured an initial understanding of variability across firms and time.

To examine the time-series properties of the panel data, Fisher-type unit root tests based on the Augmented Dickey–Fuller (ADF) approach were applied. These tests assessed the stationarity of the variables at the 5 per cent significance level. The results indicated that the Environmental Disclosure Index and firm age were stationary, while firm size exhibited some persistence. Given these properties, an estimation technique robust to autocorrelation and heteroscedasticity was required.

Pairwise Pearson correlation analysis was then conducted to explore the strength and direction of associations among the variables and to identify potential multicollinearity concerns. This analysis provided preliminary evidence on the relationships between firm characteristics and environmental disclosure prior to regression estimation.

Model adequacy was evaluated using the Ramsey RESET test to determine whether the regression model suffered from functional form misspecification or omitted variable bias. The test results confirmed that the model was correctly specified, validating its suitability for hypothesis testing.

The hypotheses were tested using a Prais–Winsten regression with panel-corrected standard errors (PCSEs). This estimation technique was selected because of its effectiveness in correcting for serial correlation and heteroscedasticity commonly associated with panel datasets. Statistical inferences were based on z-statistics and corresponding probability values at the 5 per cent level of significance.

The empirical model estimated in the study is specified as follows:

$$edi_{it} = \beta_0 + \beta_1 roa_t + \beta_2 lnfz_t + \beta_3 lnfa_t + \beta_4 bc_t + \mu_t \quad (3.2)$$

Where:

ed_1_t	=	Environmental disclosure index on a rating scale approach at time t,
β_0 ,	=	Constants,
$\beta_1, \beta_2, \beta_3, \dots, \beta_5, \beta_n$	=	Coefficient of the independent variables in the model,
roa_t	=	Return on Assets at time t,
$lnfz_t$	=	Natural Logarithm of firm size at time t,
$lnfa_t$	=	Natural Logarithm of Firm Age from the date of incorporation at time t,
bc_t	=	Board Composition at time t,
μ_t	=	Stochastic error associated with the model.

Hypotheses were tested based on the sign, magnitude, and statistical significance of the estimated coefficients, using z-statistics and associated probability values at the 5 per cent level of significance.

Data Presentation and Analysis

Descriptive Statistics

Table 1: Descriptive Statistics of Variables

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>
<i>edi</i>	504	0.2247	0.2286	0.0361	0.1429	0.3143
<i>lnfz</i>	504	16.998	17.265	2.1488	10.956	22.064
<i>lnfa</i>	504	3.6232	3.8607	0.6048	1.3863	4.3944

The descriptive statistics indicate that the sampled Nigerian manufacturing firms exhibit diverse characteristics. The environmental disclosure index (edi) is relatively narrowly distributed, whereas firm size (lnfz) and firm age (lnfa) show greater variability. The proximity of the means and medians suggests approximate symmetry in the distributions. Standard deviations demonstrate dispersion within the sample, and the relatively small standard

errors imply precise estimations of population parameters, reflecting the reliability of the dataset for further analysis.

Stationarity Tests

Table 2: Fisher-Type Unit Root Tests (ADF) for Panel Data

Variable	<i>Pm (Modified Inverse Chi²)</i>	<i>P-value</i>	<i>Stationary at 5%?</i>
<i>edi</i>	14.026	0.0000	Yes
<i>lnfz</i>	3.2735	0.0005	No/Conditional
<i>lnfa</i>	165.350	0.0000	Yes

The Fisher-type unit root tests indicate that the environmental disclosure index (*edi*) and firm age (*lnfa*) are stationary at the 5% significance level, whereas firm size (*lnfz*) shows some persistence, suggesting the presence of a unit root. These findings justify the use of Prais–Winsten regression with panel-corrected standard errors (PCSEs) to account for heteroscedasticity and autocorrelation in the panel dataset, ensuring that the regression coefficients are unbiased and consistent.

Pairwise Correlations

Table 3: Pearson Correlation Matrix with P-values (in italics)

Variable	<i>edi</i>	<i>lnfz</i>	<i>lnfa</i>
<i>edi</i>	1		
<i>lnfz</i>	0.097*	1	
<i>lnfa</i>	0.022	-0.067	1

P-values: edi-lnfz = 0.030; edi-lnfa = 0.624

The correlation analysis shows that firm size (*lnfz*) is positively and significantly correlated with environmental disclosure (*edi*), indicating that larger firms are more likely to engage in environmental disclosure practices. Conversely, firm age (*lnfa*) exhibits a negligible correlation with *edi*, suggesting that the age of the firm has little influence on environmental disclosure levels. These patterns provide initial support for hypothesis one but not hypothesis two, highlighting the importance of controlling for other firm characteristics in regression analysis.

Model Mis-specification

Table 4: Ramsey RESET Test for Model Mis-specification

Test	<i>F-statistic</i>	<i>DF</i>	<i>Prob > F</i>
Ramsey RESET (<i>fitted values of edi</i>)	0.61	F(3,131)	0.6104

The Ramsey RESET test confirms that the regression model is correctly specified. There is no evidence of omitted variable bias affecting the model, indicating that the included predictors sufficiently explain variations in environmental disclosure. This validation strengthens the reliability of the subsequent hypothesis testing results.

Hypothesis Testing: Prais–Winsten Regression (PCSEs)

Table 5: Prais–Winsten Regression Results of Environmental Disclosure Index

Variable	<i>Coefficient</i>	<i>Std. Error</i>	<i>z-statistic</i>	<i>P> z </i>
<i>lnfz</i>	0.0020	0.0009	2.30	0.021*
<i>lnfa</i>	-0.0015	0.0012	-1.25	0.211
<i>fa</i>	-0.0147	0.0060	-2.45	0.014*
<i>bc</i>	-0.0052	0.0039	-1.33	0.183
Constant	0.2100	0.0180	11.67	0.000*

Note: *Significant at 5% level.

The regression results reveal that firm size (*lnfz*) positively and significantly affects environmental disclosure, with a coefficient of 0.0020 ($z = 2.30$, $p = 0.021$). This indicates that as firms grow in size, they are more likely to engage in

environmental disclosure practices. Firm age (Infa), however, shows an insignificant negative relationship with edi (coefficient = -0.0015, $z = -1.25$, $p = 0.211$), suggesting that the age of the firm does not meaningfully influence environmental disclosure activities. Foreign association (fa) exerts a significant negative effect, while board composition (bc) shows a negative but statistically insignificant influence. Overall, the model supports the relevance of firm size in explaining variations in environmental disclosure while confirming the robustness of the regression model through appropriate diagnostics.

Hypothesis Tests

Table 6: Hypotheses Testing Summary

Hypothesis	Variable	Coefficient	z-stat	$P > z $	Decision
H1	Infz	0.0020	2.30	0.021*	Reject H0
H2	Infa	-0.0015	-1.25	0.211	Fail to reject H0

Note: *Significant at 5% level.

Hypothesis One

H₀: Firm size has no significant effect on environmental disclosure index among Nigerian firms.

H₁: Firm size exerts a significant effect on environmental disclosure index among Nigerian firms.

The hypothesis was tested using the coefficient and test statistics associated with firm size (Infz) in the Prais–Winsten regression with panel-corrected standard errors reported in Table 5. The estimated coefficient for firm size is positive ($\beta = 0.0020$) with a z-statistic of 2.30 and a corresponding p-value of 0.021. Since the p-value is less than the 5 percent significance level, the null hypothesis is rejected. This result indicates that firm size has a statistically significant effect on environmental disclosure among Nigerian firms. The positive sign of the coefficient further suggests that larger firms tend to disclose more environmental information than smaller firms, possibly due to higher public visibility, greater stakeholder pressure, and stronger regulatory scrutiny. The finding provides empirical support for the argument that firm size is an important determinant of environmental disclosure practices in Nigeria.

Hypothesis Two

H₀: Firm age has no significant effect on environmental disclosure index among Nigerian firms.

H₁: Firm age exerts a significant effect on environmental disclosure index among Nigerian firms.

The second hypothesis was examined using the regression coefficient for firm age (Infa) as presented in Table 5. The estimated coefficient for firm age is negative ($\beta = -0.0015$) with a z-statistic of -1.25 and a p-value of 0.211. Because the p-value exceeds the 5 percent significance threshold, the null hypothesis cannot be rejected. This implies that firm age does not have a statistically significant effect on environmental disclosure among Nigerian firms. Although older firms may be expected to have more established reporting structures, the result suggests that longevity alone does not necessarily translate into improved environmental disclosure practices. Instead, disclosure behaviour appears to be driven more by firm size than by the number of years a firm has been in operation.

Discussion of Findings

The findings of this study reveal that firm size exerts a statistically significant and positive effect on environmental disclosure among Nigerian firms, while firm age does not have a significant influence. These outcomes provide important insights when interpreted through the lenses of the Resource-Based View and the Liability of Obsolescence theory, as well as in relation to prior empirical evidence.

The significant positive relationship between firm size and environmental disclosure aligns strongly with the Resource-Based View. Larger firms typically command superior financial, human, and organizational resources that are valuable and difficult for smaller firms to replicate. These resource endowments enable them to absorb the costs associated with environmental reporting, develop formal disclosure systems, and comply with increasing stakeholder and regulatory expectations. From an RBV standpoint, environmental disclosure can be interpreted as a strategic capability arising from scale-related advantages, including economies of scale, stronger governance structures, and greater access to specialized expertise. The result suggests that Nigerian firms with larger operational scope are better positioned to transform their internal resources into reputational and legitimacy gains through environmental disclosure, thereby reinforcing their competitive standing.

The result further reflects the conditional nature of size-related advantages emphasized in RBV literature. While smaller firms may benefit from agility and flexibility, environmental disclosure is a resource-intensive activity that often requires formalized processes, documentation systems, and sustained financial commitment. In relatively regulated and stakeholder-sensitive contexts such as environmental accountability, scale appears to matter more than agility. This finding supports arguments that larger firms are more visible and thus more exposed to public scrutiny, which compels them to disclose more environmental information as a legitimacy-seeking strategy. The Nigerian context, characterized by growing environmental awareness and regulatory pressure, may further amplify this size effect.

In contrast, the absence of a statistically significant relationship between firm age and environmental disclosure lends support to the Liability of Obsolescence (or Aging) theory. Although older firms are often presumed to possess accumulated experience and established routines, such routines may become rigid over time and fail to adapt to evolving environmental disclosure standards. The finding suggests that longevity alone does not guarantee responsiveness to contemporary environmental reporting demands. Instead, aging firms may experience structural inertia and reduced adaptability, which weakens the influence of age on proactive disclosure practices. This outcome implies that environmental disclosure is more closely linked to current strategic capacity than to historical presence in the market.

The non-significant effect of firm age also indicates that younger firms are not necessarily disadvantaged in environmental disclosure relative to older ones, particularly if they adopt modern reporting frameworks early or embed sustainability practices into their operational models from inception. This interpretation resonates with the argument that accumulated resources may depreciate in relevance over time if not continuously renewed. Thus, firm age without corresponding strategic renewal may not translate into superior disclosure performance.

When compared with empirical studies, the findings partially converge and diverge in meaningful ways. The positive and significant effect of firm size corroborates the results of Shuaibu (2020), Prot et al. (2021), and Adekanmi (2022), all of whom reported that larger firms disclose more environmental or sustainability-related information. However, the insignificance of firm age contrasts with Shuaibu (2020) and Prot et al. (2021), who found firm age to be a significant determinant of disclosure. This divergence may be attributed to differences in sectoral coverage, country context, measurement approaches, or econometric techniques. It may also reflect evolving disclosure dynamics in Nigeria, where regulatory expectations and stakeholder pressure increasingly emphasize capacity and scale over organizational maturity.

The findings also extend Abubakar (2017), who reported a positive but insignificant effect of firm size on environmental disclosure. By employing a more robust panel estimation technique, this study provides stronger evidence that firm size matters in explaining disclosure behaviour. At the same time, the insignificance of firm age aligns with the broader aging theory, which cautions against assuming linear benefits from organizational longevity.

Conclusion

In conclusion, the study provides empirical evidence on the role of firm-specific characteristics in explaining variations in the Environmental Disclosure Index among Nigerian firms. The findings reveal that firm size exerts a statistically significant and positive effect on environmental disclosure, indicating that larger firms are more inclined to engage in more extensive and structured environmental reporting. This outcome reflects the greater resource endowment, operational capacity, and public visibility of larger firms, which enable them to absorb disclosure-related costs, respond to stakeholder pressures, and institutionalize sustainability reporting practices more effectively.

Conversely, firm age does not exhibit a statistically significant effect on environmental disclosure. This suggests that organizational longevity alone does not necessarily translate into improved environmental reporting practices. While older firms may possess accumulated experience and established routines, such attributes do not automatically enhance responsiveness to evolving environmental disclosure expectations. The result implies that adaptability, resource availability, and strategic orientation are more critical than mere years of operation in driving environmental disclosure behaviour.

Overall, the study concludes that sustainable firms' characteristics influence environmental disclosure in a selective manner. Firm size emerges as a key determinant of environmental disclosure among Nigerian firms, whereas firm age does not significantly shape disclosure outcomes. These findings highlight that environmental transparency in Nigeria is more strongly associated with organizational capacity and scale rather than with firm maturity,

emphasizing the need for policies and incentives that support smaller firms in developing the capabilities required for effective environmental reporting.

Recommendations

Based on the findings on the effect of sustainable firms' characteristics on the Environmental Disclosure Index among Nigerian firms, targeted policy and managerial actions are necessary to strengthen environmental accountability and promote a sustainability-oriented corporate culture. Given that firm size emerged as a significant determinant of environmental disclosure, while firm age did not, recommendations should emphasize capacity-building rather than longevity.

Corporate regulators and policymakers should design supportive frameworks that enhance the resource capacity of smaller firms, enabling them to progressively scale up and participate more actively in environmental reporting. This can be achieved through improved access to sustainable financing, incentives for environmental compliance, and structured mentorship or partnership programmes that allow smaller firms to learn from larger, more established organizations. By strengthening the operational and financial base of smaller firms, their ability to adopt standardized environmental disclosure practices will be significantly improved.

In addition, continuous capacity development initiatives should be introduced to deepen firms' understanding of environmental disclosure requirements and best practices. Well-structured training and educational programmes should target firms across all stages of development, with emphasis on the strategic and reputational benefits of transparent environmental reporting. Such programmes would help firms align with regulatory expectations, respond effectively to stakeholder pressures, and integrate sustainability considerations into their core business strategies. Collectively, these measures would contribute to more consistent and comprehensive environmental disclosure practices among Nigerian firms.

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