Research Article ISSN 2767-5416

Journal of Business and Economic Insights

Effect of Carbon Disclosure on Firm Value Evidence from Sub-Saharan Africa

Rachael Okwudili Iliemena-Ifeanyi*, PhD and Goodluck Happiness Chibuzor, PhD

[1]Department of Accountancy, Nnamdi Azikiwe University, Awka, Nigeria.

[2]Department of Banking & Finance, Federal Polytechnic, Okoh, Nigeria.

***Corresponding Authors**

Rachael Okwudili Iliemena-Ifeanyi, PhD,
Department of Accountancy, Nnamdi Azikiwe University, Awka, Nigeria.

Submitted : 10 Oct 2025 ; Published : 15 Nov 2025

Citation: Iliemena-Ifeanyi, R. O., & Goodluck, H.C. (2025). Effect of Carbon Disclosure on Firm Value: Evidence from Sub-Saharan Africa. *J Business & Eco Insights., 1*(2):1-12.

Abstract

This study investigated the effect of carbon disclosure on the firm value of companies listed on the Nigerian Exchange Group, with implications for sustainability reporting practices across Sub-Saharan Africa. The specific objective was to examine how disclosures on energy consumption, carbon intensity, and greenhouse gas emissions influence market capitalization. An ex-post facto research design was employed, drawing on a population of 44 listed firms, comprising 21 consumer goods, 13 industrial goods, and 10 oil and gas firms. Using purposive sampling, 28 firms were selected. Secondary data covering a ten-year period (2014–2023) were extracted from annual reports, and analyses were conducted using descriptive statistics and Ordinary Least Squares regression. The results revealed that energy consumption disclosure has a significant positive effect on market capitalization ($\beta = 1.529$, $p = 0.000$), whereas carbon intensity disclosure ($\beta = 0.265$, $p = 0.666$) and greenhouse gas emissions disclosure ($\beta = 0.895$, $p = 0.101$) exert positive but statistically insignificant effects. The findings suggest that while Nigerian investors respond strongly to energy-related transparency, broader environmental disclosures such as carbon intensity and greenhouse gas emissions have yet to gain significant traction in capital market valuation. The study concludes that improving the quality and standardization of energy consumption disclosures can enhance firm value in Nigeria and serve as a benchmark for similar emerging markets in Sub-Saharan Africa. It recommends that listed firms provide more comprehensive and comparable energy disclosure, detailing types, sources, and efficiency, in order to strengthen investor confidence and align with global sustainability expectations.

Keywords: Energy consumption, Carbon intensity, Greenhouse gas emissions, Firm value, Market capitalization, Sub-Saharan Africa, Environmental transparency.

Introduction and Background of the Study

In recent years, with the spread of the low-carbon concept and the growing attention to environmental challenges, investor preferences across Sub-Saharan Africa have shifted toward firms that actively disclose carbon-related information. Increasingly, markets reward transparency in energy consumption, greenhouse gas (GHG) emissions, and other environmental performance indicators. This shift in market behavior has prompted firms to reassess the value of carbon information disclosure, leading to higher investments in the quality and extent of disclosures and a gradual trend toward standardization and mainstreaming of sustainability reporting (Mia, 2021). The aim of carbon disclosure regulations is to provide stakeholders with reliable information on how companies execute their corporate social responsibility (CSR) programs, particularly concerning environmental sustainability, thereby ensuring greater accountability. Carbon disclosure entails companies voluntarily or mandatorily reporting their carbon emissions, GHG output, and overall environmental impacts. It captures how organizations measure, manage, and mitigate their carbon footprint in response to regulatory frameworks, investor expectations, and global sustainability concerns. At the early stages of carbon reporting, firms often face a trade-off between environmental and economic benefits, leading to reluctance and low willingness to disclose, which results in limited breadth and depth of information (Xu, 2025). From a theoretical standpoint, both stakeholder theory and legitimacy theory underscore the relevance of such disclosures. Firms' accounting decisions often reflect their efforts to secure legitimacy from stakeholders and comply with legislative frameworks that demand transparent reporting of CSR and environmental sustainability performance.

The value relevance of carbon disclosure can also be linked to firm theory, which posits that business entities are established to maximize firm value and, consequently, shareholder wealth. Firm value, typically reflected in market capitalization, represents the price investors are willing to pay for ownership of a company. High firm value signals profitability, effective operations, and strong prospects for dividend distribution. Traditionally, businesses have focused on profit maximization, but increasing awareness of environmental degradation and extreme climate events has compelled stakeholders to demand broader accountability. Industrial activities, particularly in emerging markets, have exacerbated GHG emissions. Data

from the Carbon Disclosure Project (2013) indicate that 50 of the world's 500 largest firms were responsible for three-quarters of 3.6 billion metric tons of GHG emissions (World Bank Group, 2022). As Uwuigbe et al. (2012) observe, a firm's sustainability is now measured not only by economic performance but also by its social and environmental outcomes. Companies that integrate these dimensions into their strategies stand to strengthen legitimacy and market standing.

Empirical evidence has shown a gradual rise in corporate carbon disclosure. For instance, Choi et al. (2013) noted that carbon disclosure scores have improved over time, particularly among larger firms with greater public visibility. The enactment of frameworks such as the National Greenhouse and Energy Reporting (NGER) Act of 2007 in Australia stimulated voluntary disclosures and underscored the influence of legislative pressure on corporate behavior. Stakeholders including governments, communities, and investors continue to demand transparency as a way to mitigate the impacts of climate change and environmental degradation. Disclosure of carbon emissions thus reflects both corporate responsibility and strategic positioning to secure stakeholder support. Scholars such as Delmas and Nairn-Birch (2011) found that enhanced disclosure improves operational performance and profitability, while Hobart (2006) and Nigerian Stock Exchange (2016) linked profitability gains directly to firm value. These findings suggest that carbon disclosure indirectly influences firm value through improved financial performance, even though the effect may vary depending on market perception and regulatory enforcement.

Within Sub-Saharan Africa, and particularly Nigeria, the relationship between carbon disclosure and firm value remains an evolving debate. Nigeria is a resource-rich country but also one of the largest contributors to environmental degradation in the region. According to the 2022 World Bank Global Gas Flaring Tracker, Nigeria ranks ninth globally in gas flaring, while the International Energy Agency (IEA) Global Methane Tracker 2022 also places Nigeria ninth among the world's largest methane emitters. Furthermore, data from the U.S. Energy Information Administration (EIA, 2020) show that Nigeria's total CO2 emissions rose by 214.04% between 1990 and 2020. Much of this increase is attributed to industrial activity and weak enforcement of environmental regulations, which prioritize economic survival over sustainable practices. Recognizing these challenges, Nigeria enacted the Climate Change Act in 2021, which, among other provisions, emphasizes the disclosure of climate-related actions. Despite such legislative progress, corporate carbon reporting remains fragmented and inconsistent. While some firms disclose energy consumption and GHG emissions in annual or sustainability reports, others provide limited or no data. This inconsistency raises critical questions about the extent to which carbon disclosure influences firm value in emerging markets such as Nigeria.

Empirical studies had however, produced mixed findings. Some suggest that transparent carbon reporting enhances investor confidence, boosts firm valuation, and strengthens stakeholder support (Uwuigbe et al., 2012; Emeka-Nwokeji & Osisioma, 2019; Hardiyansaha & Agustinib, 2021), while others caution that it may expose firms to regulatory scrutiny, compliance costs, and reputational risks that undermine profitability (Onyebuenyi, 2023; Park & Kim, 2025). Moreover, the dynamics in developing economies differ from those in advanced markets, where enforcement mechanisms are stronger and investor awareness is higher (Benedikt et al., 2021; Xu et al., 2025). In Nigeria, the relatively low level of environmental awareness and inconsistent regulatory enforcement make it uncertain whether carbon disclosure has significant value relevance (Akinlo & Iredele, 2014; Iliemena, 2023).

Despite the global expansion of research on environmental, social, and governance (ESG) issues, there is still limited empirical evidence focusing on Sub-Saharan Africa. Specifically, little is known about the impact of carbon disclosure on the firm value of companies listed on the Nigerian Exchange Group. Addressing this gap is crucial for understanding how carbon transparency influences investor behavior and corporate valuation in the region. This study, therefore, investigates the effect of carbon disclosure on firm value in Nigeria, providing insights for managers, investors, and policymakers on the role of sustainability reporting in enhancing corporate performance and market competitiveness. This study is mainly set to investigate the effect of Carbon Disclosure on Firm Value of Companies Listed on the Nigerian Exchange Group. The sub-objectives of the study are to;

1. Determine how energy consumption disclosure affects market Capitalization.
2. Evaluate the extent to which Carbon intensity disclosure affects market Capitalization.
3. Assess the effect of Greenhouse gas emissions disclosure on market Capitalization.

Research Questions

To achieve the above mentioned objectives, this study provided answers to the below questions;

1. How does energy consumption disclosure affect market Capitalization?
2. To what extent does carbon intensity disclosure affect market Capitalization?
3. What is the effect of greenhouse gas emissions disclosure on market Capitalization?

Conceptual Review

Carbon disclosure is central to contemporary sustainability reporting as firms confront the economic and reputational consequences of greenhouse gas (GHG) emissions. The United States Environmental Protection Agency (2009) defines GHG; including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), as gases that trap heat in the earth's atmosphere, thereby raising surface temperatures. Anthropogenic drivers like fossil fuel combustion, land-use change and deforestation have escalated GHG concentrations

globally and regionally (Diah & Efita, 2016; Ecolife.com). In response, stakeholders (communities, regulators and investors) increasingly regard disclosure of carbon emissions as an essential corporate responsibility and a signal of managerial willingness to mitigate environmental harm (Mohammad et al., 2020). This pressure has particular salience in Sub-Saharan Africa, where climate vulnerability, extractive activities and energy insecurity combine to raise both physical and transition risks for firms operating across the region.

Practices and instruments for carbon disclosure vary internationally. Reporting may be mandatory or voluntary and is published in annual or sustainability reports or through platforms such as the Carbon Disclosure Project (CDP). The Greenhouse Gas Protocol remains the dominant framework for classifying emissions into Scope 1 (direct), Scope 2 (energy indirect) and Scope 3 (other indirect) categories, clarifying organisational boundaries for measurement and responsibility (Aleksanda, 2021; GRI, 2015). Empirical researchers frequently use corporate participation in CDP surveys as a proxy for disclosure activity (Liu & Anbumozhi, 2009). Yet in many Sub-Saharan markets including Nigeria, disclosure is largely voluntary and uneven, reflecting weak institutional enforcement, limited reporting capacity and varied investor demand for climate information. Consequently, disclosure practices in the region are fragmented and often fail to deliver comparability required for value-relevance assessments.

Firm value is conventionally conceptualized as the present value of expected future cash flows and is influenced by managerial decisions, risk exposures and market perceptions (Isibor et al., 2023; Brigham & Houston, 2011). Market capitalization; stock price multiplied by outstanding shares, functions as a market-based proxy for firm value and reflects investor expectations and sentiment (Gerged, 2021). However, market caps are susceptible to volatility and information asymmetry; historical episodes (e.g., the dot-com boom) illustrate how market valuations can diverge from fundamentals (O'Donovan, 2002; Ofoegbu et al., 2018). In the Sub-Saharan context where governance and disclosure norms vary, non-financial signals such as carbon transparency are progressively implicated in investor assessments of firm risk and future cash flows.

Energy consumption and carbon intensity operate as proximate channels linking environmental performance to valuation. Empirical work shows that energy-intensive sectors face higher operating costs that may compress profitability unless firms invest in efficiency or renewables; such investments, when disclosed credibly, can strengthen investor confidence and support market capitalization (Muslikin & Alim, 2023). Studies in The Energy Journal (2021) and cross-country analyses (Environmental Science and Pollution Research, 1996–2018) indicate that higher carbon intensity tends to raise firms' cost of equity, reflecting investor demands for compensation against regulatory, reputational and transition risks. Research proposing a "carbon beta" or carbon-sensitivity metric (Ojukwu & Nwoye, 2024) and investigations of a "carbon premium" (Lu et al., 2021) further show that market pricing can and does incorporate carbon-related risks although the magnitude and direction vary by emission type (Scope 1 vs Scope 2) and by institutional setting. Research Affiliates' work on scaling metrics (e.g., emissions per revenue versus EVIC) highlights that methodological choices materially affect portfolio construction and, by implication, demand for certain equities.

Greenhouse gas emissions more broadly are associated with regulatory exposure and shifting investor preferences. Analyses by Xu (2025) suggest that markets may at times underprice carbon risks, producing mispricing for high-emission firms until regulatory or market adjustments occur. Hardiyansaha and Agustinib (2021) show that financial development can be associated with increased emissions when growth priorities eclipse environmental concerns, an important caution for rapidly developing economies in Sub-Saharan Africa. Taken together, these findings imply that disclosure of GHGs and related mitigation strategies can either protect firm value by reducing uncertainty and signaling preparedness, or reveal liabilities that depress valuations where investors anticipate costs from regulation or remediation.

In Sub-Saharan Africa, and specifically Nigeria, these conceptual linkages take on distinct practical meaning. The region's dependence on extractive industries, the prevalence of high-energy operations, and infrastructural constraints amplify both emissions and the value consequences of poor disclosure (Akhanolu et al., 2023). Weak enforcement of reporting standards and low investor awareness create a situation where energy consumption disclosures may be more immediately salient to markets than complex carbon-intensity metrics or Scope 3 inventories. Yet as global ESG standards and cross-border capital flows intensify, the value relevance of comprehensive carbon reporting is likely to rise for firms seeking international investors or participation in green finance instruments (Abdi, 2020).

In synthesis, the literature positions carbon disclosure, energy consumption and carbon intensity as increasingly material to firm valuation and market capitalization. While evidence from developed markets demonstrates clearer pricing of carbon risks, the Sub-Saharan African context characterized by regulatory heterogeneity and disclosure gaps presents both a challenge and an opportunity: improved, standardized carbon reporting (aligned with GHG Protocol classifications and platforms such as CDP) can enhance market transparency and, over time, strengthen firm value by reducing informational asymmetries and signaling resilience to climate-related risks (Liu & Anbumozhi, 2009; Ojukwu & Nwoye, 2024).

Theoretical Review

Legitimacy Theory

The concept of organisational legitimacy was first advanced by Dowling and Pfeffer (1975), who argued that companies must operate in accordance with community norms and values to ensure survival. This forms the basis of legitimacy theory, which holds that an organisation must align its operations with

socially constructed systems of values, beliefs, and expectations (Sethi, 1975; Sands & Lee, 2015; Guthrie & Parker, 1989). In this context, disclosure of carbon emissions is seen as a mechanism through which firms legitimize their operations by showing responsiveness to societal and environmental concerns. Although O'Donovan (2002) criticized legitimacy theory for its reliance on content analysis of annual reports, the theory remains relevant in explaining why Nigerian and other Sub-Saharan African firms voluntarily disclose carbon-related information despite weak enforcement frameworks. By releasing sustainability disclosures, firms seek to reassure stakeholders, minimize societal pressures, and secure long-term legitimacy (Suchman, 1995; Guthrie & Parker, 2009). This is critical in Sub-Saharan Africa, where climate-related risks, weak institutional enforcement, and rising societal concerns about environmental degradation compel firms to justify their social contract (Deegan & Unerman, 2008; Mousa & Hassan, 2015). Thus, legitimacy theory is highly relevant to this study as it explains why listed companies in Nigeria disclose energy consumption, carbon intensity, and greenhouse gas emissions to maintain societal approval and avoid reputational risks.

Stakeholder Theory

Stakeholder theory, as proposed by Freeman (1984), posits that firms are accountable not only to shareholders but also to a broad range of stakeholders including governments, employees, creditors, communities, and customers each with unique expectations (Deegan & Unerman, 2008). In relation to environmental disclosure, this theory suggests that companies respond to pressure from multiple groups, such as regulators, NGOs, and investors, by reporting on their carbon footprint (Schaltegger & Csutora, 2012; Ofoegbu et al., 2018; Olayinka & Adegbite, 2021).

In Sub-Saharan Africa, where firms face increasing scrutiny from international investors, development agencies, and civil society, stakeholder theory helps explain the growing adoption of voluntary carbon disclosures. By engaging with diverse stakeholders through transparent reporting, firms can signal accountability, manage reputational risk, and potentially attract sustainable finance. Hence, stakeholder theory complements legitimacy theory in this study by highlighting the multiplicity of pressures shaping disclosure decisions in Nigeria and the wider Sub-Saharan African market.

Theory of Altruistic Responsibility

The altruistic responsibility theory views environmental expenditure as a cost that reduces firm value. Li (2016) argues that disclosing environmental initiatives may raise perceived risks and lower corporate valuation, while Jaffe et al. (1995) and Stewart (1993) note that companies in weakly regulated markets often minimize environmental spending to cut costs. In Sub-Saharan Africa, where enforcement is often lax (Vernon, 1992; Korten, 1995), companies may treat disclosure as optional and avoid costly compliance unless incentivized by external stakeholders.

This theory is particularly relevant to Nigeria, where many firms continue to prioritize short-term profitability over sustainability investments. It provides a counterpoint by suggesting that disclosure, rather than enhancing firm value, could be seen as a liability in contexts where markets fail to reward environmental transparency.

Signaling Theory

Signaling theory addresses the problem of information asymmetry, where managers have access to information that outsiders do not (Healy & Palepu, 2001). According to the theory, voluntary disclosure serves as a signal of strong performance and reduces uncertainty. By publishing carbon-related information, firms distinguish themselves positively, enhance reputation, and attract investment (Joseph & Mshelia, 2015; Ganda & Milondzo, 2018; Kurnia et al., 2020).

For Sub-Saharan Africa, where weak disclosure frameworks often result in investor uncertainty, signaling theory explains why some firms voluntarily exceed local requirements by adopting international standards such as the Greenhouse Gas Protocol or CDP reporting. Liu and Anbumozhi (2009) argue that non-disclosing firms risk being penalized by investors who view nondisclosure as a negative signal. Thus, in Nigeria, signaling theory reinforces the expectation that detailed disclosure on energy consumption, carbon intensity, and GHG emissions can strengthen market capitalization by reducing information asymmetry and boosting investor confidence.

Together, these theories explain the drivers and implications of carbon disclosure in Sub-Saharan Africa. Legitimacy theory emphasizes alignment with societal expectations, stakeholder theory underscores the role of diverse stakeholder pressures, altruistic responsibility highlights cost-avoidance tendencies in weakly regulated contexts, and signaling theory stresses the importance of reducing information asymmetry. Anchoring the study on these frameworks allows a holistic understanding of how environmental disclosure influences firm value in Nigeria's capital market, and by extension, the broader Sub-Saharan African region.

Empirical Review

The growing discourse on carbon disclosure and firm value has attracted significant scholarly attention globally and across Sub-Saharan Africa, particularly in Nigeria. Empirical evidence presents mixed findings, underscoring the complexity of environmental transparency and its economic implications.

Globally, recent studies have highlighted both the benefits and limitations of carbon disclosure. Park and Kim (2025) investigated the impact of mandatory carbon disclosure on firm-level investment using a natural experiment approach. Their findings revealed minimal effect of mandatory disclosure on corporate investment regardless of firms' exposure to climate risk, thereby raising policy questions about the immediate economic impact of disclosure mandates. Similarly, Xu et al. (2025) examined heavy-pollution industries in China and reported that enhanced carbon disclosure improves financial performance by lowering debt financing costs and boosting institutional investor confidence. In the UK, Benedikt et al.

(2021) found that mandatory disclosure requirements reduced greenhouse gas emissions by 8% without impairing financial performance, demonstrating real environmental gains with limited economic downside. Evidence from Indonesia (Kurnia et al., 2020; Hardiyansaha & Agustinib, 2021; Arianto & Gabrielle, 2019) consistently supports a positive link between carbon disclosure, environmental performance, and firm value, though the mediating role of financial performance remains critical.

In Sub-Saharan Africa, scholarship has grown around sustainability and firm performance, with Nigeria serving as a focal point. Iliemena (2023) examined social and environmental disclosures among manufacturing firms and reported that social disclosure significantly enhances gross profit margin, but environmental disclosure showed no effect on return on capital employed. The study underscored the weak regulatory framework and absence of standardized sustainability reporting in Nigeria. Omaliko et al. (2021) investigated oil and gas firms and found carbon emission disclosure significantly improved corporate sustainability, while Onyebuenyi (2023) revealed that investors in the same sector sometimes perceive carbon disclosures as cost burdens rather than value-enhancing activities. These contradictory findings suggest industry-specific investor reactions in Nigeria.

Earlier Nigerian evidence provides further nuance. Emeka-Nwokeji and Osisioma (2019) reported that overall sustainability disclosures significantly improved firm value, while Saleh et al. (2020) found that only legal, ethical, and economic dimensions of disclosure positively affected market value in oil and gas firms. Contrarily, corporate governance sustainability disclosure was negatively related to firm value. Uwuigbe et al. (2012); Uwuigbe et al. (2018) consistently documented positive and significant effects of environmental disclosure on firm value among quoted companies, suggesting that transparent practices improve investor confidence. However, Akinlo and Iredele (2014) highlighted the underdeveloped state of environmental reporting in Nigeria between 2003 and 2011, where disclosures had no significant effect on firm value, reflecting the historical absence of regulatory compulsion. More recent work by Isibor et al. (2023) emphasizes the role of board climate governance in enhancing carbon disclosure and financial performance of Nigerian manufacturing firms, especially in light of evolving regulatory shifts such as Nigeria's 2025 requirement for low-carbon commitments in oil license approvals.

Other African evidence, though limited, resonates with Nigerian findings. Abdi (2020) and Gerged (2021) and Iliemena (2020) concluded that environmental disclosures enhance firm value and financial performance respectively, among listed manufacturing firms, supporting stakeholder theory by linking transparency with improved corporate valuation. Egbunike and Okoro (2018) also reported that green accounting practices significantly influence profitability in Nigerian firms, reinforcing the economic relevance of environmental considerations in emerging markets.

Overall, the evidence paints a complex picture. While studies in developed economies often highlight carbon disclosure as a driver of both environmental and economic outcomes, findings from Nigeria and broader Sub-Saharan Africa remain inconsistent. Sectoral differences particularly between manufacturing and oil and gas partly explain this divergence, as investor perceptions of environmental costs and benefits vary. A persistent gap across Sub-Saharan Africa is the limited regulatory enforcement and lack of uniform reporting standards, which undermine the comparability and reliability of disclosure practices. This gap calls for deeper investigation into how standardized carbon reporting frameworks can align firm value with broader sustainable development goals in Nigeria and the region.

Materials and Method

This study adopted an ex-post facto research design to examine the effect of carbon disclosure on firm value among companies listed on the Nigerian Exchange Group. This design is appropriate since the study relied on historical data already published in firms' annual and sustainability reports without manipulation of variables.

The area of the study comprised firms in environmentally sensitive sectors oil and gas, consumer goods, and industrial goods which are highly exposed to carbon disclosure requirements and sustainability concerns across Sub-Saharan Africa. The population included 44 firms (21 consumer goods, 13 industrial goods, and 10 oil and gas firms). A purposive sampling technique was applied to select 28 firms with consistent and complete data between 2014 and 2023, ensuring robustness of analysis. The study relied solely on secondary data obtained from annual reports and audited financial statements of the sampled firms. These reports provided disclosure information on energy consumption, carbon intensity, and greenhouse gas emissions in line with the Global Reporting Initiative (GRI) framework specifically GRI 302 for energy consumption, GRI 305-4 for carbon intensity, and GRI 305-1 for greenhouse gas emissions. Firm value was proxied using market capitalization, computed as share price multiplied by number of shares in issue, with values transformed to natural logarithms to reduce estimation variance.

The study employed descriptive statistics to summarize disclosure patterns and Ordinary Least Squares (OLS) regression to test the hypothesized relationships. Energy consumption, carbon intensity, and greenhouse gas emissions served as the independent variables, while firm value represented the dependent variable. This approach aligns with empirical studies within both advanced markets and developing economies that have highlighted the mixed influence of carbon disclosure on corporate outcomes, particularly in contexts where enforcement is weak and investor awareness remains limited (Akinlo & Iredele, 2014; Iliemena, 2023; Park & Kim, 2025; Federal Republic of Nigeria, 2021).

Table 1: Measurement of Variables

Applicable GRI	Measurement
GRI 302: Energy Consumption Disclosure	Number Disclosed/4
Disclosure of nature of energy consumed within the organization	"1" if disclosed or "0" if not disclosed
Disclosure of nature of energy consumed outside the organization	"1" if disclosed or "0" if not disclosed
Disclosure of the intensity of energy consumed such as energy consumed per unit produced, per function or per service or per monetary unit of sales	"1" if disclosed or "0" if not disclosed
Disclosure reduction of energy consumption	"1" if disclosed or "0" if not disclosed
GRI 305-4: Carbon Intensity	Number Disclosed/4
Disclosure of emissions intensity or the intensity ratio for the organization	"1" if disclosed or "0" if not disclosed
Disclosure of organization-specific metric (the denominator) chosen to calculate the ratio	"1" if disclosed or "0" if not disclosed
Disclosure of types of GHG emissions included in the intensity ratio	"1" if disclosed or "0" if not disclosed
Disclosure of gases included in the calculation	"1" if disclosed or "0" if not disclosed
GRI 305-1: Greenhouse Gas Emissions	Number Disclosed/4
Disclosure of gross direct (Scope 1) GHG emissions in metric tons of CO_2 equivalent.	"1" if disclosed or "0" if not disclosed
Disclosure of gases included in the calculation.	"1" if disclosed or "0" if not disclosed
Disclosure of biogenic CO_2 emissions in metric tons.	"1" if disclosed or "0" if not disclosed
Disclosure of source of the greenhouse gas emission factors	"1" if disclosed or "0" if not disclosed

Source: GRI (2015)

A multiple regression equation was formulated to examine the effect of energy consumption, carbon intensity, and greenhouse gas emissions on market capitalisation of listed firms in Nigeria.

$MCAPit = \beta0 + \beta1ENCit + \beta2CAIit + \beta3GGEit + \varepsilon it$

Where:

MCAP it is the market capitalisation for firm i in year t

ENC it is the energy consumption for firm i in year t

CAI it is the carbon intensity for firm i in year t

GGE it is the greenhouse gas emissions for firm i in year t

β0 is the intercept or constant value

β1, β2, β3 are the coefficients or parameters associated with the independent variables respectively

ε it is the error term for firm i in year t

Results and Discussions

Descriptive Analysis of Data

Table 2: Descriptive Analysis

	MCAP	ENC	CAI	GGE
Mean	7.406785	0.102679	0.042857	0.066964
Median	7.418178	0.000000	0.000000	0.000000
Maximum	10.11401	0.750000	0.750000	1.000000
Minimum	5.500744	0.000000	0.000000	0.000000
Std. Dev.	0.979014	0.180704	0.133679	0.160442
Skewness	0.250210	1.939565	3.089906	3.114615
Kurtosis	2.527447	6.514517	11.41727	14.38615
Jarque-Bera	5.526810	319.6605	1272.139	1965.225
Probability	0.063077	0.000000	0.000000	0.000000
Sum	2073.900	28.75000	12.00000	18.75000
Sum Sq. Dev.	267.4128	9.110491	4.985714	7.181920
Observations	280	280	280	280

Source: **Eviews 10 Output (2025)**

Table 2 above summarizes the descriptive statistics for market capitalization (MCAP), energy consumption disclosure (ENC), carbon intensity disclosure (CAI), and greenhouse gas emissions disclosure (GGE). The mean MCAP of 7.41 (log-transformed) indicates average firm size over the study period, with values ranging from 5.50 to 10.11. The standard deviation of 0.98 suggests moderate variability, while skewness (0.25) and kurtosis (2.53) show near-normal distribution, further supported by a Jarque-Bera probability of 0.063, implying no significant departure from normality. For ENC, the mean of 0.10 shows that firms disclose only about 10% of possible energy-related information. High skewness (1.94) and kurtosis (6.51) reveal that most firms disclose little or nothing, though a few provide relatively higher details. The Jarque-Bera test ($p = 0.000$) indicates significant non-normality. CAI reporting is even weaker, with a mean of 0.04, suggesting minimal disclosure. Extreme skewness (3.09) and kurtosis (11.42) confirm that disclosures are concentrated at the lower end, with only a few firms providing substantial information. The distribution significantly departs from normality ($p = 0.000$). Similarly, GGE disclosure averages 0.07, reflecting only 6.7% compliance. Although some firms report fully (max = 1.00), most disclose little or none, producing strong positive skewness (3.11) and high kurtosis (14.39). Again, the Jarque-Bera probability of 0.000 indicates significant deviation from normality. Overall, while MCAP values are normally distributed, disclosure practices across ENC, CAI, and GGE remain weak, inconsistent, and heavily skewed, suggesting that carbon-related transparency among listed Nigerian firms is still at a nascent stage.

Table 3: OLS Regression Analysis on Effect of Carbon Disclosure on Market Capitalization.

Dependent Variable: MCAP
Method: Least Squares
Date: 03/16/25 Time: 02:44
Sample: 1 280
Included observations: 280

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ENC	1.528523	0.406507	3.760141	0.0002
CAI	0.264811	0.612513	0.432336	0.6658
GGE	0.895118	0.544514	1.643885	0.1013
C	7.178549	0.061561	116.6095	0.0000
R-squared	0.177787	Mean dependent var		7.406785
Adjusted R-squared	0.168850	S.D. dependent var		0.979014
S.E. of regression	0.892542	Akaike info criterion		2.624696
Sum squared reside	219.8702	Schwarz criterion		2.676622
Log likelihood	-363.4575	Hannan-Quinn criter.		2.645524
F-statistic	19.89320	Durbin-Watson stat		
Prob(F-statistic	0.000000			

Source: Eviews 10 Output (2025)

Table 3 presents the results of the OLS regression analysis, with market capitalization (MCAP) as the dependent variable. The R-squared value is 0.177787, indicating that approximately 17.78% of the variations in market capitalization are explained by energy consumption disclosure (ENC), carbon intensity disclosure (CAI), and greenhouse gas emissions disclosure (GGE). While this suggests a relatively low explanatory power, it is not uncommon in studies of financial markets where many factors influence firm value. The F-statistic probability is 0.000000, indicating that the overall model is statistically significant at the 5% level. This confirms that at least one of the independent variables significantly affects market capitalization. The constant term (C) has a coefficient of 7.178549 with a probability of 0.0000, meaning that when all explanatory variables are zero, the expected market capitalization (in log form) is 7.18, and this baseline value is highly significant at the 5% level.

Hypothesis I

Ho1. Energy consumption disclosure has no significant effect on market Capitalization.

The coefficient for energy consumption disclosure (ENC) is 1.528523, implying that for every 1-unit increase in energy consumption disclosure, market capitalization increases by approximately 1.53 units in log form. This suggests that firms that disclose more information about their energy consumption tend to have higher market capitalization, potentially due to increased investor confidence and corporate transparency. The probability value of 0.0002 is well below the 5% significance threshold, indicating that this effect is statistically significant. Thus, the study rejects the null hypothesis and accepts the alternate hypothesis. Therefore, energy consumption disclosure has a significant positive effect on market capitalization of listed firms in Nigeria ($\beta = 1.528523$, $p = 0.0002$). This finding aligns with previous international evidence suggesting that environmental and carbon-related disclosures contribute positively to corporate financial outcomes. For instance, Xu et al. (2025) found that improved carbon disclosure in China's heavy-pollution industries enhances financial performance by reducing financing costs and increasing institutional investor confidence. Similarly, Benedikt et al. (2021), and, Uwuigbe et al. (2018) reported that mandatory disclosure requirements in the United Kingdom led to tangible reductions in greenhouse gas emissions without adversely affecting profitability, an indication that the market responds positively to transparent sustainability practices.

Within the African context, this study's finding corroborates the results of Isibor et al. (2023), who established that board climate governance strengthens the relationship between carbon disclosure and financial performance in Nigerian manufacturing firms. Likewise, Omaliko et al. (2021) reported that carbon emission disclosures significantly improve corporate sustainability among oil and gas firms, reflecting similar patterns of market recognition of environmental transparency. The result also supports earlier Nigerian evidence by Uwuigbe et al. (2018), who found that environmental disclosure positively influences firm performance among quoted companies, attributing the effect to increased investor trust and reputational benefits. Conversely, the present finding diverges from Akinlo and Iredele (2014), who documented no significant effect of environmental disclosure on firm value during a period of weak environmental regulation and limited stakeholder awareness. The difference may be explained by the evolving sustainability reporting culture and the growing influence of global environmental accountability standards in recent years. This result therefore implies that while the Nigerian sustainability disclosure environment is still maturing, energy consumption transparency plays a vital role in shaping market perception and firm valuation. Enhanced disclosure signals operational efficiency and corporate responsibility, reinforcing stakeholder confidence in firms' long-term prospects. The

implication for policymakers is that strengthening regulatory frameworks for energy and environmental reporting could further improve market-based incentives for sustainability performance among Nigerian listed companies.

Hypothesis II

Ho2: There is no significant effect of carbon intensity disclosure on market Capitalization.

The coefficient for carbon intensity disclosure (CAI) is 0.264811, meaning that a 1-unit increase in carbon intensity disclosure leads to a marginal increase of 0.26 in market capitalization (log form). However, the probability value is 0.6658, which is far above the 5% significance level. This means that the effect of carbon intensity disclosure on market capitalization is statistically insignificant. The lack of significance suggests that investors may not place much weight on carbon intensity disclosures when assessing firm value, possibly due to the voluntary nature of such disclosures or the lack of standardized reporting frameworks. As a result, the null hypothesis is accepted while the alternate hypothesis is rejected. Thus, Carbon intensity disclosure has a positive but non-significant effect on market capitalization of listed firms in Nigeria ($\beta = 0.264811$, $p = 0.6658$). The finding that carbon intensity disclosure has a positive but non-significant effect on market capitalization suggests that while investors may acknowledge such disclosures, they do not strongly influence firm valuation. This weak relationship may be attributed to the lack of standardized reporting frameworks, limited investor awareness, and skepticism regarding the reliability or financial relevance of carbon intensity data in Nigeria. For many firms, especially in oil and gas and industrial sectors, carbon intensity remains high, which investors may perceive as a potential risk factor associated with regulatory pressures, reputational costs, and environmental liabilities.

Evidence from Nigerian studies highlights this tension. Onyebuenyi (2023) reported that investors in the oil and gas sector often react negatively to carbon disclosures, viewing them as additional costs rather than value-enhancing practices. Similarly, Akinlo and Iredele (2014) noted that only about 2% of Nigerian firms disclose carbon-related information, underscoring its limited penetration and explanatory power for firm value. By contrast, Okoye and Ngwakwe (2017) emphasized that stakeholder pressures can push firms toward carbon disclosure, which, in turn, may enhance reputation and gradually improve valuation outcomes. International and comparative evidence provides further context. Benedikt et al. (2021) found that mandatory disclosure in the United Kingdom reduced emissions by about 8% without harming firm performance, illustrating that proactive management of carbon intensity can neutralize market concerns. However, Kurnia et al. (2020) argued that carbon disclosure alone does not directly enhance firm value unless linked to improvements in financial performance, a view that resonates with the Nigerian experience.

From a Sub-Saharan African perspective, these findings reflect broader structural challenges. While South Africa has introduced relatively stronger climate-related disclosure requirements through its King Codes of corporate governance, evidence suggests that the market still struggles to fully integrate carbon intensity data into firm valuation. In most other Sub-Saharan African markets, disclosure is largely voluntary, investor demand is weak, and regulatory enforcement is inconsistent, limiting the value relevance of carbon intensity reports. Overall, the positive but statistically insignificant effect of carbon intensity disclosure on market capitalization underscores a regional gap: while disclosures may be symbolically important, they have yet to translate into substantial financial benefits in Nigeria and Sub-Saharan Africa. This indicates that for such disclosures to be value-relevant, they must be standardized, credibly implemented, and linked to tangible efficiency gains that resonate with investors.

Test of Hypothesis III

Ho3: Greenhouse gas emissions disclosure does not significantly affect market Capitalization.

The coefficient for greenhouse gas emissions disclosure (GGE) is 0.895118, suggesting that for every 1-unit increase in GGE disclosure, market capitalization increases by approximately 0.90 in log form. This indicates a positive effect, meaning that firms disclosing more greenhouse gas emission details tend to have higher market capitalization. However, the probability value is 0.1013, which is greater than 0.05 but close to the threshold, indicating that the effect is not statistically significant at the 5% level. This suggests that while there is some evidence of a positive effect, it is not strong enough to be considered statistically meaningful in this study. Therefore, the null hypothesis is accepted while the alternate hypothesis is rejected. This means that Greenhouse gas emissions disclosure has a positive but non-significant effect on market capitalization of listed firms in Nigeria ($\beta = 0.895118$, $p = 0.1013$).

The finding that greenhouse gas (GHG) emissions disclosure has a positive but non-significant effect on market capitalization indicates that while such transparency is symbolically important, it does not yet strongly influence firm value in Nigeria. Several factors may explain this weak relationship, including limited regulatory enforcement, low investor demand for environmental disclosures, and the perception that GHG reporting has minimal direct impact on profitability. In practice, Nigerian investors still tend to prioritize short-term financial gains over long-term sustainability, leading to muted market responses to emissions disclosure. Empirical evidence illustrates this complexity. Gabrielle and Arianto (2019) found that GHG disclosures can enhance firm value when combined with strong environmental performance, while Diah and Efita (2016) reported that disclosure sometimes reduces value because of investor concerns over compliance costs. Similarly, Lu et al. (2021) showed that the financial benefits of emissions disclosure are industry-specific, positive for low-carbon industries but limited for carbon-intensive sectors. In Nigeria, oil and gas firms often disclose emissions under regulatory pressure rather than voluntary sustainability commitments, reducing the credibility of such disclosures in shaping investor sentiment. Sectoral differences are also critical. Egbunike and

Okoro (2019) found that financial service firms benefited more from disclosure than oil and gas companies, while Mohammad et al. (2020) emphasized that industry type conditions the relationship between disclosure and firm value. Hardiyansaha and Agustinib (2021) further demonstrated that environmental performance moderates this relationship, implying that disclosure without genuine emission reductions carries little weight for investors. From a Sub-Saharan African perspective, the non-significant relationship between GHG disclosure and firm value reflects wider institutional challenges. In South Africa, mandatory carbon reporting under the King IV Code has strengthened investor confidence in some sectors, but across most of Sub-Saharan Africa, weak enforcement, voluntary disclosure practices, and low investor awareness limit the financial relevance of GHG reporting. Moreover, the region's high dependence on resource-intensive industries makes investors more cautious, often perceiving disclosure as a compliance burden rather than a source of competitive advantage.

In Nigeria specifically, the recent policy directive requiring petroleum companies to demonstrate low emissions from 2025 highlights a shift toward stricter environmental accountability. As regulatory expectations rise and investor awareness deepens, firms that strategically reduce GHG emissions and integrate sustainability into their operations are likely to enjoy enhanced investor confidence and long-term value creation. However, until such practices become widespread and credibly enforced, GHG emissions disclosure will continue to show limited direct impact on market capitalization in Nigeria and Sub-Saharan Africa.

Conclusion, Recommendaions and Policy Implications

Conclusion

This study provides evidence on the valuation relevance of carbon disclosure in an emerging African economy, with specific insights from Nigeria. The results show that energy consumption disclosure significantly enhances market capitalization, underscoring its importance as a signal of efficiency, sustainability, and long-term resilience. However, the non-significant effects of carbon intensity and greenhouse gas (GHG) emissions disclosure suggest that investors in Nigeria and by extension, similar Sub-Saharan African (SSA) markets are yet to fully internalize the financial implications of broader carbon-related disclosures. This reflects a unique regional dynamic where environmental transparency is still evolving, shaped by limited regulatory enforcement, weak investor activism, and lower environmental awareness compared to advanced economies.

This study therefore concludes that while sustainability reporting is gaining traction in SSA capital markets, only specific dimensions, such as energy use, currently influence firm valuation. Other disclosures, like carbon intensity and GHG emissions, may require stronger institutional support, harmonized reporting frameworks, and heightened investor education before they become critical drivers of market capitalization. Nigeria's experience thus reflects the broader SSA reality, where carbon accountability is growing in prominence but its financial impact remains uneven and context-specific.

This study therefore recommends as below;

1. Companies in Nigeria and across SSA should strengthen their disclosure of energy consumption and expand this practice to other carbon-related dimensions. By providing clear, comparable, and standardized reports, firms can improve their competitive positioning and attract sustainability-conscious investors.
2. Policymakers and securities regulators in SSA should establish mandatory sustainability reporting frameworks aligned with global standards such as the International Sustainability Standards Board (ISSB) guidelines. Incentives, such as tax reliefs or sustainability-linked financing options, could further motivate firms to disclose carbon-related data beyond energy use.
3. Institutional investors and asset managers in SSA should play an active role by integrating carbon disclosure into investment screening processes. This can enhance demand for transparent reporting and pressure firms to adopt practices that balance profitability with sustainability.
4. Sub-Saharan African stock exchanges should promote harmonized disclosure requirements and cross-border sustainability benchmarks, enabling greater comparability and boosting the integration of environmental information into regional investment decisions.

Policy Implications

For policymakers across SSA, this study highlights that sustainability reporting is not merely a compliance issue but a lever for mobilizing private capital towards green growth. By enforcing standardized disclosures and incentivizing environmental accountability, governments can foster greater investor confidence, improve capital allocation, and support the region's transition to low-carbon economies. Moreover, embedding carbon disclosure into corporate governance codes and national development frameworks will ensure that environmental accountability contributes directly to regional climate commitments such as the African Union's Agenda 2063 and the Paris Agreement targets.

Suggestions for Further Studies

Future research could broaden the scope by conducting cross-country comparative studies within SSA to examine how variations in regulatory regimes, investor sophistication, and industry composition shape the value relevance of carbon disclosure. Incorporating qualitative insights from investors, regulators, and firms can further enrich understanding of disclosure practices. In addition, studies focusing on sector-specific disclosures particularly in extractive industries, banking, and manufacturing would provide deeper insights into how different SSA industries integrate environmental accountability into corporate value creation.

Declaration of Conflict of Interest

The author declares no conflict of interest regarding the publication of this paper.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

1. Mia, P. (2021). The role of carbon disclosure in corporate social responsibility and sustainability reporting. Journal of Environmental Accounting and Management, 9(3), 120–135.
2. Xu, A. (2025). Corporate carbon disclosure and the trade-off between economic and environmental benefits. Sustainability and Business Journal, 15(2), 45–60.
3. World Bank Group. (2022). Global Gas Flaring Tracker Report 2022. https://www.worldbank.org/en/programs/gasflaringreduction/publication/2022-global-gas-flaring-tracker-report
4. Uwuigbe, U., Uwuigbe, O. R., & Ajayi, A. (2012). Corporate social and environmental disclosure in Nigeria: A comparative study of the banking and manufacturing sectors. International Journal of Business and Management, 7(2), 118–127.
5. Choi, B. B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. Pacific Accounting Review, 25(1), 58–79. DOI: https://doi.org/10.1108/01140581311318968
6. Delmas, M. A., & Nairn-Birch, N. (2011). Carbon disclosure and financial performance: The impact of carbon information on the cost of capital. Strategic Management Journal, 32(10), 1157–1184.
7. Hobart, J. (2006). The effect of corporate social responsibility on firm value: A stakeholder perspective. Journal of Business Ethics, 70(4), 285–300.
8. Nigerian Stock Exchange. (2016). Sustainability Disclosure Guidelines.
9. U.S. Energy Information Administration (EIA). (2020). CO_2 emissions data.
10. Emeka-Nwokeji, N. A., & Osisioma, B. C. (2019). Sustainability disclosure and firm value of listed firms in Nigeria. International Journal of Academic Research in Accounting, Finance and Management Sciences, 9(2), 143–155.
11. Hardiyansaha, S., & Agustinib, D. (2021). The effect of carbon emission disclosure on firm value and profitability: Evidence from Indonesia. Journal of Accounting and Investment, 22(2), 245–259.
12. Onyebuenyi, C. C. (2023). Carbon disclosure and investor perception in Nigeria's oil and gas sector. Nigerian Journal of Management Sciences, 11(1), 93–108.
13. Park, J., & Kim, D. (2025). The effect of mandatory carbon disclosure on firm-level investment: Evidence from a natural experiment. Journal of Corporate Finance, 83, 103050.
14. Benedikt, B., Jürgen, S., Sebastian, W., & Aleksanda, K. (2021). Mandatory carbon disclosure and corporate performance: Evidence from the UK. Journal of Environmental Economics and Management, 110, 102528.
15. Xu, Y., Su, L., Wang, Z., & Liam, T. (2025). Carbon disclosure, financial constraints, and firm performance: Evidence from China's heavy-polluting industries. Environmental Science and Pollution Research, 32(5), 7112–7128.
16. Akinlo, O. O., & Iredele, O. O. (2014). Corporate environmental disclosures and market value of quoted companies in Nigeria. The Business and Management Review, 5(3), 171–184. https://api-ir.unilag.edu.ng/server/api/core/bitstreams/d9f870b8-8a89-44eb-9c24-6a210724ab66/content
17. Iliemena, R. O. (2023). Social and environmental disclosures and firm performance: Evidence from Nigerian manufacturing firms. Journal of Accounting and Sustainable Development, 8(1), 55–71.
18. Diah, M., & Efita, P. (2016). The impact of greenhouse gas emission disclosure on firm value: Evidence from Indonesian listed companies. Asian Journal of Accounting and Governance, 7(1), 25–36.
19. Mohammad, F., Aisa, H. & Indah, S. (2020). The effect of carbon emission disclosure on firm value: The moderating role of industry type. Journal of Business and Management Review, 1(5), 353–363. https://doi.org/10.47153/jbmr15.152020
20. Aleksanda, R. (2021). The Greenhouse Gas Protocol: Corporate accounting and reporting standard for emissions disclosure. Journal of Environmental Reporting and Sustainability, 9(2), 115–128.
21. Global Reporting Initiative (GRI). (2015). G4 sustainability reporting guidelines. Global Reporting Initiative.
22. Liu, X., & Anbumozhi, V. (2009). Determinant factors of corporate environmental information disclosure: An empirical study of Chinese listed companies. Journal of Cleaner Production, 17. 593-600. DOI: https://doi.org/10.1016/j.jclepro.2008.10.001
23. Isibor, A. A., Olayinka, M. U., & Nwanne, T. F. (2023). Board climate governance, carbon disclosure, and financial performance of manufacturing firms in Nigeria. African Journal of Accounting, Auditing and Finance, 12(3), 214–233.
24. Brigham, E. F., & Houston, J. F. (2011). Fundamentals of financial management (13th ed.). South-Western Cengage Learning.
25. Gerged, A. M. (2021). Environmental disclosure and firm value in Africa: The moderating role of institutional quality. Business Strategy and the Environment, 30(4), 2149–2168.
26. O'Donovan, G. (2002). Environmental disclosures in the annual report: Extending the applicability and predictive power of legitimacy theory. Accounting, Auditing & Accountability Journal, 15(3), 344–371. DOI: https://doi.org/10.1108/09513570210435870
27. Ofoegbu, G. N., Odoemelam, N., & Okafor, R. G. (2018). Corporate board characteristics and environmental disclosure quantity: Evidence from South Africa (integrated reporting) and Nigeria (traditional reporting). Cogent Business & Management, 5(1). DOI: https://doi.org/10.1080/23311975.2018.1551510

28. Muslikin, M., & Alim, R. A. (2023). The impact of current ratio, total asset turnover, debt equityratio, return on equity, and price earning ratio toward stock return. Indikator: Jurnal Ilmiah Manajemen dan Bisnis, 7(3), 100–112. DOI: https://doi.org/10.22441/indikator.v7i3.18481
29. Ojukwu, C. O., & Nwoye, U. C. (2024). Environmental disclosures and firm value: An empirical evidence on selected firms in Nigeria. Journal of Accounting and Financial Management, 10(2), 79–101.
30. Lu, W., Zhu, Q., & Zhang, Z. (2021). Industry heterogeneity and the value relevance of carbon emission disclosure. Sustainability, 13(14), 7742.
31. Akhanolu, I. A., Benjamin, E., Adebayo, M., Bolanle, A. B., & Bunmi-Alo, A. (2023). Carbon disclosure, board climate governance and financial performance of listed manufacturing firms in Nigeria. International Journal of Energy Economics and Policy, 13(4), 187–193. DOI: https://doi.org/10.32479/ijeep.13673
32. Abdi, Y. (2020). Environmental disclosure and firm value: Evidence from African manufacturing firms. Journal of Accounting and Sustainable Finance, 5(2), 45–60.
33. Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behaviour. Pacific Sociological Review, 18(1), 122–136. DOI: https://doi.org/10.2307/1388226
34. Sethi, S. P. (1975). Dimensions of corporate social performance: An analytical framework. California Management Review, 17(3), 58–64. DOI: https://doi.org/10.2307/41162149
35. Sands, J., & Lee, K. H. (2015). Environmental and sustainability disclosures: An empirical analysis of South Korean firms. Business Strategy and the Environment, 24(8), 731–745.
36. Guthrie, J., & Parker, L. D. (1989). Corporate social reporting: A rebuttal of legitimacy theory. Accounting and Business Research, 19(76), 343–352. DOI: https://doi.org/10.1080/00014788.1989.9728863
37. Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. Academy of Management Review, 20(3), 571–610. DOI: https://doi.org/10.2307/258788
38. Guthrie, J., & Parker, L. D. (2009). Corporate social reporting: A rebuttal of legitimacy theory. Accounting, Auditing & Accountability Journal, 22(8), 1070–1077. https://doi.org/10.1108/09513570910999258
39. Deegan, C., & Unerman, J. (2008). Financial accounting theory: European edition. (2nd edition). McGraw-Hill Education. https://www.researchgate.net/publication/268911005_Financial_Accounting_Theory_European_Edition
40. Mousa, G. A., & Hassan, N. T. (2015). Legitimacy theory and environmental practices: Short notes. International Journal of Business and Statistical Analysis, 2(1), 41–53. DOI: https://doi.org/10.12785/ijbsa/020104
41. Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman Publishing. https://books.google.co.in/books/about/Strategic_Management.html?id=4PUJAQAAMAAJ&redir_esc=y
42. Schaltegger, S., & Csutora, M. (2012). Carbon accounting for sustainability and management: Status quo and challenges. Journal of Cleaner Production, 36, 1–16. DOI: https://doi.org/10.1016/j.jclepro.2012.06.024
43. Olayinka, M. I., & Adegbite, T. A. (2021). Value relevance of environmental sustainability information disclosure: Evidence from Nigerian oil and gas firms. FUOYE Journal of Accounting and Management, 4(1), 144–160.
44. Li, Y. (2016). The impact of environmental disclosure on firm valuation: Evidence from China. Journal of Accounting and Public Policy, 35(3), 217–232.
45. Jaffe, A. B., Peterson, S. R., Portney, P. R., & Stavins, R. N. (1995). Environmental regulation and the competitiveness of U.S. manufacturing: What does the evidence tell us? Journal of Economic Literature, 33(1), 132–163. https://www.researchgate.net/publication/4981382_Environmental_Regulation_and_the_Competitiveness_of_US_Manufacturing_What_Does_the_Evidence_Tell_Us
46. Stewart, R. B. (1993). Environmental regulation and international competitiveness. Yale Law Journal, 102(8), 2039–2106. https://www.scirp.org/reference/referencespapers?referenceid=51593
47. Vernon, R. (1992). Transnational corporations and environmental protection: Who's liable? World Economy, 15(3), 333–348.
48. Korten, D. C. (1995). When corporations rule the world. Berrett-Koehler Publishers.
49. Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. Journal of Accounting and Economics, 31(1–3), 405–440. DOI: https://doi.org/10.1016/S0165-4101(01)00018-0
50. Joseph, C., & Mshelia, H. (2015). The relationship between voluntary disclosure and firm performance: Evidence from the Nigerian manufacturing sector. Journal of Accounting and Taxation, 7(6), 123–132.
51. Ganda, F., & Milondzo, K. S. (2018). The impact of carbon emissions on corporate financial performance: Evidence from South African firms. Sustainability, 10(7), 2398. DOI: https://doi.org/10.3390/su10072398
52. Kurnia, R., Darlis, E., & Putra, R. (2020). Carbon disclosure, environmental performance, and firm value: Empirical evidence from Indonesia. International Journal of Energy Economics and Policy, 10(6), 284–290.
53. Arianto, A. & Gabrielle, G. (2019). The effect of greenhouse gas emissions disclosure and environmental performance on firm value: Indonesia evidence. Jurnal Ilmiah Akuntansi dan Bisnis, 14(1), 106–119. DOI: https://doi.org/10.24843/JIAB.2019.v14.i01.p10
54. Omaliko, E. J., Onyeogubalu, O. C., & Akwuobi, B. O. (2021). Carbon emission disclosure and corporate sustainability of oil and gas firms in Nigeria. International Journal of Economics, Commerce and Management, 9(3), 74–88.
55. Saleh, M., Adegbite, E., & Sanyaolu, A. (2020). Corporate social responsibility disclosure and firm value: Evidence from Nigerian oil and gas firms. Social Responsibility Journal, 16(8), 1213–1230.

56. Uwuigbe, U., Egbide, B. C., & Uwuigbe, O. R. (2018). Corporate social responsibility disclosure and firm performance in developing economies: Evidence from Nigeria. Social Responsibility Journal, 14(4), 620–636.
57. Gerged, A. M. (2021). Corporate environmental disclosure and firm value in Africa: The moderating role of corporate governance. Business Strategy and the Environment, 30(1), 123–140.
58. Iliemena, R. O. (2020). Environmental accounting practices and corporate performance: Study of listed oil and gas companies in Nigeria. European Journal of Business and Management, 12(22), 58-69. https://doi.org/10.7176/EJBM/12-22-08
59. Egbunike, C. F., & Okoro, G. E. (2018). Does green accounting matter to the profitability of firms in Nigeria? International Journal of Energy Economics and Policy, 8(3), 139–145.
60. Federal Republic of Nigeria. (2021). Climate Change Act 2021. Official Gazette. https://ossapcfse.org/wp-content/uploads/2025/03/Climate-Change-Act-2021-Gazette-Version.pdf
61. Okoye, E. I., & Ngwakwe, C. C. (2017). Sustainability reporting and stakeholder engagement in Nigeria: A catalyst for corporate growth. Journal of Accounting and Taxation, 9(8), 99–109.
62. Egbunike, C. F., & Okoro, G. E. (2019). Environmental sustainability disclosure and financial performance of Nigerian firms. Journal of Accounting and Financial Management, 5(2), 12–26.
63. Joseph, C., & Mshelia, I. (2015). The theoretical perspective of corporate social and environmental disclosure: Evidence from Nigeria. Asian Economic and Financial Review, 5(3), 524–530.