SUSTAINABILITY PRACTICES AND FINANCIAL PERFORMANCE IN LISTED OIL AND GAS COMPANIES IN NIGERIA AND GHANA: A COMPARATIVE INVESTIGATION

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ABSTRACT.
Background: Sustainability practices and corporate financial performance have become increasingly important in the corporate world, particularly for publicly listed oil and gas companies. **Aims:** The study investigated the effects of sustainability practices on the financial performance of listed oil and gas companies in Nigeria and Ghana. **Methods:** An e*x post facto research design was employed, with panel regression estimates u*sed to test the hypotheses. Secondary data were retrieved from the annual financial publications of the selected companies in Nigeria and Ghana. **Sample:** The study focused on 5 listed oil and gas companies in Nigeria and 5 listed oil and gas companies in Ghana using a purposive sampling technique. **Results:** Findings revealed that economic sustainability practices greatly improve RoA and Tobin's Q in Nigerian oil and gas companies, whereas the effect is statistically insignificant in Ghanaian firms. Environmental sustainability positively impacted RoA in Nigeria, but it had no significant effect on performance metrics in Ghana. Governance sustainability influenced financial performance in both nations, noting the significance of efficient governance structures in promoting financial results. Additionally, social sustainability practices enhanced firm performance in Nigeria, whereas their impact in Ghana was insignificant on RoA but significant on Tobin's Q. **Conclusions:** The research finds that sustainability practices significantly contribute to improving firm performance in Nigeria's oil and gas industry, especially in terms of economic, environmental, social, and governance aspects. Conversely, sustainability practices exhibit limited and varied impacts on firm performance in Ghana, with governance sustainability standing out as the most reliable factor influencing financial results in both nations. **Implications:** The findings imply that sustainability practices, especially strong governance structures, enhance oil and gas firm performance, with greater effectiveness in Nigeria than in Ghana due to differences in implementation and institutional support.

Keywords: Economic sustainability, environmental sustainability, governance sustainability, social sustainability, Return on assets, Tobin's Q.

JEL Classification*:* G30, Q56, M14

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Introduction

Corporate financial performance is the company's ability to generate revenue, manage its assets and liabilities, and maintain a healthy financial position. It comprehensively evaluates a company's overall standing across key financial categories like assets, liabilities, equity, expenses, and revenue (Aguguom, 2024). A firm's financial performance can be analysed regarding profitability, dividend growth, sales turnover, asset base, and capital employed. However, there is still debate among several disciplines regarding how the performance of firms should be measured and the factors that affect the financial performance of companies. This performance is assessed through various business-related formulas that allow users to understand a company's effectiveness (Adekola & Akinnuli, 2021).

Strong financial performance signals a company's viability, attracts investors, and builds stakeholder trust. According to Aibar-Guzmán *et al.* (2024) performance is the function of the ability of an organisation to gain and manage the resources in several different ways to develop a competitive advantage. Meanwhile, financial performance data is crucial for making informed investment decisions, financing, and operational strategies. However, maintaining a healthy financial performance is essential for a company's long-term survival and success. Analysing financial performance allows companies to compare themselves to competitors and identify areas for improvement. Financial performance is typically measured through various financial indicators such as profitability, liquidity, solvency, and efficiency ratios (Akerele *et al.*, 2024).

Sustainability practices and corporate financial performance have become increasingly important in the corporate world, particularly for publicly listed oil and gas companies. These companies now face heightened pressure from stakeholders, investors, consumers, regulators, and society to integrate economic, environmental, social, and governance factors into their business operations (Al-Ajmi *et al.*, 2023). This shift reflects a growing recognition that long-term value creation is not solely dependent on financial performance, but also on how companies manage their economic, environmental, and social responsibility, and governance structures (Aydoğmuş *et al.*, 2022). Investors are beginning to take sustainability aspects into account when evaluating a company's prospects and risks. Companies adopt Environmental, Social and Governance (ESG) criteria to make their activities more appealing to investors due to regulatory changes and growing awareness of environmental and social issues (Bassey *et al.*, 2013).

Sustainability has shaped supply chains, product design, hiring strategies, and investment decisions in the last decade. Indian brands like Tata Power and Godrej lead by example, demonstrating that purpose-led performance is a powerful growth driver (Beekue & James, 2022). Sustainability has notably surged in the last few decades, particularly since the late 20th century. While the concept of sustainable development has roots in earlier discussions, it gained significant traction with the 1987 Brundtland Report, which emphasised meeting present needs without compromising future generations (Brooks & Oikonomou, 2018). Aside from adequate financial capital, companies also require strong governance and work practices that recognise the current and future stakeholders' environmental and social needs for long-term sustainability. In essence, corporate sustainability entails aligning the organisation's competitive activities with current stakeholders' short-term needs without jeopardising future stakeholders' long-term ability to meet their own needs, thereby adding economic, environmental, governance, and social value (Sufian & Razali, 2021).

Habib (2023) observed that substantial corporate profits and material well-being are meaningless if they come at the expense of a vast ecosystem, which has a detrimental impact on the environment and people. Therefore, the principles of corporate sustainability require that businesses bear accountability for the financial activities, assuming such responsibilities will help to mitigate the long-term losses that are likely to be borne by the stakeholders of the immediate environment where the companies operate, as well as the environmental and social impact that their activity has on the environment of host communities and other stakeholders. According to Duque-Grisales and Aguilera-Caracuel (2021), for example, oil and gas companies' operations in Nigeria are frequently linked to serious health consequences and environmental damage, which have recently resulted in persistent civil unrest and disrupted the business operations of certain multinational corporations. In contrast, Ghana, which started commercial oil production relatively recently in 2010, has taken steps to build a more transparent and accountable oil and gas sector. Despite its smaller size in terms of production compared to Nigeria, Ghana's oil and gas industry has emerged as an area of interest for sustainable development, focusing on balancing economic growth with environmental protection and social responsibility (Naeem *et al.*, 2022). The country has made strides in improving its regulatory frameworks and governance structures.

Research Gap

Many current studies regarding sustainability practices and financial performance (Ali et al., 2023; Aljanadi & Alazzani, 2023; Arena et al., 2023; Walsh et al., 2023; Wan et al., 2023) fail to account for the latest sustainability practices and performance behaviour trends through 2024. Notably, Nigeria legalised sustainability reporting in 2023, representing a significant change in regulatory policy. During this time, Ghana has witnessed changes in voluntary disclosures. Nevertheless, existing literature has not thoroughly examined these recent institutional shifts and economic adaptations. Broadening the analysis to incorporate data through 2024 is crucial for capturing current realities, evaluating the efficacy of new ESG frameworks, and offering prompt, policy-relevant insights. Furthermore, studies have utilised Ordinary Least Squares (OLS) and other panel regression models, which frequently presuppose homoskedasticity and the absence of autocorrelation. Nevertheless, firm-level panel data, particularly across various years and nations such as Nigeria and Ghana, often display heteroskedasticity, autocorrelation, and cross-sectional dependence, breaching these assumptions. For example, research like (Aibar-Guzmán *et al.,* 2024; Grosu e*t al.,* 2023) failed to thoroughly explore these possible econometric problems, which restricts the reliability of their results. Therefore, the current study utilises Feasible Generalised Least Squares (FGLS) to fill a methodological gap in existing literature, providing more precise and reliable results that capture the dynamic and structurally varied characteristics of sustainability practices and financial performance among oil and gas companies in Nigeria and Ghana.

Research Objective

The broad objective was to examine the effect of sustainability practices on the financial performance of listed oil and gas companies in Nigeria and Ghana. Specifically, the study assessed the influence of economic sustainability practices, environmental sustainability practices, governance sustainability practice s and social sustainability practices on the financial performance of listed oil and gas companies in Nigeria and Ghana spanning from 2014 to 2024. The rationale for selecting 2014 as the base year arises from the substantial drop in worldwide oil prices by the end of that year. This significant price decrease affected the financial results of oil and gas companies worldwide, especially those in oil-reliant economies such as Nigeria and Ghana's emerging oil sector. The price drop emphasised the necessity for oil and gas firms to embrace more sustainable and efficient operational methods to stay resilient during economic disruptions.

Theoretical background

Economic Sustainability and Financial Performance

The oil and gas industry in Nigeria and Ghana operates in a context marked by significant environmental hazards, regulatory oversight, and stakeholder pressure. These circumstances generate costs as well as opportunities for companies aiming for economic sustainability. Empirically, practices of economic sustainability are expected to show quantifiable links with corporate financial performance, either positively by improving efficiency and reputation, or negatively by increasing compliance and operational expenses. Economic sustainability, characterised by a company's capacity to achieve enduring profitability while meeting both economic and ethical obligations to stakeholders, is positively associated with financial performance. Grygiel-Tomaszewska and Turek (2021) claim that companies that harmonise profit maximisation with sustainable development goals generally experience enhanced shareholder value. In the same way, clear reporting of economic performance enhances investor trust and boosts capital access, potentially benefiting profitability and market valuation (Saeed et al., 2025).

Rahim (2024) empirically demonstrated that firms exhibiting greater profitability tend to reveal more information about economic responsibility, indicating a correlating connection between financial robustness and sustainability involvement. In Nigeria and Ghana's oil and gas sectors, disclosing economic sustainability is anticipated to boost corporate image and stakeholder confidence, which will lower financial risks and diminish the chances of business collapse. Roffia et al. (2021) show that companies participating in economic disclosures have a reduced risk of bankruptcy when compared to those that do not disclose. This suggests a beneficial connection between sustainability reporting and enduring financial stability. On the other hand, initiatives aimed at economic sustainability can also have adverse short-term impacts on financial performance. Adhering to environmental regulations, investing in green technologies, implementing community enhancement initiatives, and implementing transparency mechanisms increase operational expenses and capital investment. Russo and Perrini (2010) points out that compliance with legal and regulatory requirements places obligatory financial responsibilities on companies.

Consequently, the expected outcome is that economic sustainability practices demonstrate a dual connection with financial performance in the oil and gas industry. In the near term, investments in sustainability and compliance expenses could adversely affect profits. In the long run, greater transparency, enhanced reputation, reduced risk exposure, and stronger stakeholder relationships are expected to positively impact financial performance and corporate sustainability. Based on the argument above, the study formulates the first hypothesis as follows:

H_o1: Economic sustainability practices have no significant effect on the financial performance of oil and gas firms in Nigeria and Ghana.

Environmental Sustainability and Financial Performance

Practices aimed at environmental sustainability have become crucial to corporate strategies as companies confront increasing environmental risks, regulatory demands, and stakeholder expectations. Green accounting refers to the identification and quantification of environmental costs and their incorporation into management decision-making, allowing organisations to handle environmental responsibilities alongside achieving financial targets (Chukwuebuka & Okenwa, 2023). The worldwide discussion on corporate accountability for environmental harm has increased the demand for environmental sustainability approaches, especially in sensitive sectors like oil and gas. Research data indicates a favourable connection between environmentally sustainable practices and financial outcomes. Beekue and James (2022) contend that integrating environmental initiatives into business choices creates strategic benefits, bolsters competitive positioning, and improves financial results. Environmental accounting facilitates this process by supplying data that assists companies in lowering operational expenses, diminishing environmental hazards, and generating sustained value (Howes, 2002; Eccles & Viviers, 2011). Moreover, efficient environmental management reduces environmental costs per unit produced and enhances resource efficiency, potentially increasing profitability (Brooks & Oikonomou, 2018). Investors focused on ESG factors are increasingly inclined to support companies with robust environmental performance, enhancing their capital access and market valuation (Friede, 2019).

Stakeholder theory also strengthens this beneficial connection. While conventional shareholder-centred models emphasise maximising short-term profits, recent findings indicate that neglecting stakeholder environmental demands can jeopardise corporate legitimacy and sustainability (Okafor et al., 2025). As a result, companies that adopt environmental initiatives and provide clear sustainability reporting are more likely to achieve consistent financial performance in both the short and long term. Conversely, environmental sustainability practices may produce negative short-term financial effects. Compliance with environmental regulations, investments in clean technologies, emissions-reduction systems, waste-management infrastructure, and sustainability reporting frameworks impose additional operational and capital costs (Wan et al., 2023). Ogochukwu et al. (2024) noted that excessive focus on short-term financial performance often results in reduced attention to environmental initiatives due to their immediate cost implications. In heavily regulated sectors, such as oil and gas, penalties for gas flaring, remediation obligations, and environmental taxes can further reduce short-run profitability.

Based on the argument above, the study formulates the second hypothesis as follows:
H_o2: Environmental sustainability practices have no significant effect on the financial performance of oil and gas firms in Nigeria and Ghana.

Governance, Sustainability and Financial Performance

The governance aspect of sustainability concerns the structures, processes, and relationships an organisation employs to guide and manage its activities, achieving its goals while safeguarding stakeholder interests. It creates appropriate incentives for managers, shareholders, and other stakeholders to ensure accountability and goal alignment (Singh et al., 2018). Due to the growth of multinational companies and global financial links, the disclosure of corporate governance has emerged as an essential issue for directors, regulators, and investors around the globe. Sustainability practices in governance involve internal and external measures aimed at aligning managerial power with shareholder oversight and safeguarding wider stakeholder interests. These mechanisms encompass clear board structures, efficient risk management systems, executive compensation strategies tied to company performance, and compliance frameworks that deter fraud, bribery, and other illegal activities (Chen et al., 2020; Matos, 2020). Effective governance frameworks help employees manage conflicts of interest and foster ethical behaviour within the corporation (Kahveci & Wolfs, 2019).

Empirically, sustainable governance practices are expected to be positively associated with financial performance. Lisin et al. (2022) state that corporate governance quality is a key factor influencing organisational financial results. Efficient governance minimises agency issues, enhances decision-making effectiveness, optimises capital allocation, and builds investor trust. These results reduce the cost of capital, draw in long-term investment, and ultimately enhance profitability and company value. Sustainability reports enable companies to assess and communicate the impact of their activities on economic, environmental, and social systems, thereby demonstrating their commitment to enduring corporate responsibility (Asongu & Odihiambo, 2021; Aydogmus, 2022). The Global Reporting Initiative (GRI) framework offers standardised guidelines to enable consistent assessment of sustainability performance by both internal and external stakeholders. By engaging in sustainability reporting, companies demonstrate that their operations are managed responsibly and do not jeopardise future environmental or social requirements (Ayuba et al., 2024).

Nonetheless, sustainable governance practices can also lead to adverse short-term financial effects. Creating separate boards, audit committees, compliance units, and sustainability reporting systems incurs extra administrative and oversight expenses. Greater disclosure could subject companies to heightened regulatory scrutiny or reputational risks if their performance does not meet stakeholder expectations (Dzugwahi & Ola, 2024). In certain situations, strict governance measures might hinder managerial decision-making, limiting short-term operational agility. In general, the empirical connection indicates a dual influence. In the short term, costs associated with governance compliance and reporting might lower immediate profits. Ultimately, better transparency, diminished fraud risk, increased stakeholder trust, and enhanced investor protection are anticipated to favourably impact financial performance, corporate stability, and company valuation (Enekwe et al., 2023).
Based on the argument above, the study formulates the second hypothesis as follows:

H_o3: Governance sustainability practices have no significant effect on the financial performance of oil and gas firms in Nigeria and Ghana.

Social Sustainability Practices and Financial Performance

Social sustainability initiatives demonstrate a company's dedication to operating in a way that harmonises financial goals with the well-being of employees, customers, local communities, suppliers, and society. Often implemented via Corporate Social Responsibility (CSR), social sustainability entails integrating ethical conduct, community involvement, equitable labour practices, accountability, and social advancement efforts into corporate strategy (Carroll, 2015; Crane et al., 2019). Over the years, CSR has evolved from an optional charity to a crucial business requirement, as companies increasingly recognise their social influence and responsibility to various stakeholders (Moscow & Orits, 2025).

Empirically, practices of social sustainability are anticipated to show a positive correlation with financial performance. CSR efforts boost corporate image, build stakeholder confidence, elevate employee engagement and retention, and foster customer loyalty. These results can lead to increased productivity, enhanced brand value, and greater long-term profitability (McWilliams & Siegel, 2001). Moreover, companies with robust social responsibility histories typically experience fewer operational interruptions due to community conflicts, labour disputes, or reputational issues, resulting in more stable cash flows and reduced business risk (Muhammad et al., 2023).

Nevertheless, practices related to social sustainability might generate adverse financial impacts in the short term. Expenditures on community development initiatives, employee benefit programs, charitable contributions, and social reporting frameworks raise operational expenses and could decrease short-term profits. In sectors operating in emerging economies, such as oil and gas in Nigeria and Ghana, responsibilities for community development and compensation requests can impose financial strains that affect short-term profitability (Muhmad & Muhammad, 2021).

H_o4: Social sustainability practices have no significant effect on the financial performance of oil and gas firms in Nigeria and Ghana.

Stakeholder Theory

According to the stakeholder theory, a corporation's only responsibility is to meet the interests of all stakeholders who are affected by, or affect, the organisation's performance, whether directly or indirectly (Ross et al., 2015). It highlights other stakeholders, such as local unions and the environment, and describes a firm's stakeholders from a different angle than the conventional one. Companies are encouraged to participate in greater CSR activities by this approach (Freeman & McVea, 2001). According to Russo and Perrini (2010), sustainability involvement can enhance a company's relationships with stakeholders and its capacity to draw in investors. This stands in stark contrast to its

more traditional cousin, Shareholder Theory, which places a higher priority on maximising profits for shareholders. Stakeholder theory aims to incorporate societal benefits into company operations by highlighting the external consequences of firms and their linkages to the environment. As a result, businesses now have more responsibilities than only maximising profits, which were once the exclusive responsibility of corporate organisations (Aslan *et al.,* 2021). In practice, ESG practices are strongly tied to this theory since it emphasises the importance of social and environmental factors in a company's governance and decisions. Higher ESG ratings translate into lower bankruptcy rates, which the study believes is more evidence of this theory's ability to explain how an enterprise's expanded responsibilities affect its financial performance and stability.

Methodology

The study used an ex-post facto research design. Since the study's goal was to gather information about past events, an ex post facto research strategy is suitable. The study population consisted of 14 listed oil and gas firms in Nigeria and 5 listed oil and gas companies in Ghana as of 31st December 2024. Oil and Gas companies were considered for this study because the sector is renowned for its substantial environmental and social footprints, including carbon emissions, resource depletion, and community relations. Secondary data were considered suitable for this study. The consideration for secondary data in this study is that there is already established data available in the financial reports of sampled firms spanning 2014 to 2024. Panel regression estimates were adopted as the appropriate analysis method for this study because they allow for the examination of heterogeneity among variables, cross-sectional dependence, and time effects across the sampled firms for the period covered. The study focused on 5 listed oil and gas companies in Nigeria and 5 listed oil and gas companies in Ghana using a purposive sampling technique. The equal distribution of companies facilitates a fair and significant comparative examination between the two nations. This guarantees that equal representation removes potential sampling bias that might occur if one nation's sample significantly exceeded the other's, thereby improving the reliability and applicability of the comparative results.

Empirical Model

This study adopted the model of Akerele et al. (2024) to examine the effect of sustainability practices and board structure on the financial performance of listed oil and gas companies in Nigeria and Ghana. The regression equation was originally specified as follows:

$$RoAit = \beta0 + \beta1EVIit + \beta2SOIit + \beta3ETIit + \beta4SIZEit + €it \quad 3.1$$

$$RoEit = \beta0 + \beta1EVIit + \beta2SOIit + \beta3ETIit + \beta4SIZEit + €it \quad 3.2$$

$$NPMit = \beta0 + \beta1EVIit + \beta2SOIit + \beta3ETIit + \beta4SIZEit + €it \quad 3.3$$

These models were modified to reflect the specific objectives by replacing the ethical sustainability index with the economic sustainability index and introducing governance sustainability practices. The choice to substitute the ethical sustainability index with the economic sustainability index arises from the acknowledgement that economic sustainability is an essential aspect of sustainability practices closely tied to financial outcomes. However, ethical sustainability focuses on moral conduct and corporate honesty, which, although significant, may not directly influence financial results in the same way that economic sustainability can. Financial performance is broadened to include both Return on Assets (ROA) and Tobin's Q, offering a comprehensive view of corporate performance. Leverage will be added as an extra control variable since it affects financial performance by influencing risk, capital structure, and the cost of capital. Firms with high leverage may face limited resources for sustainability efforts, potentially impacting their financial results.

Therefore, the regression models are modified as follows:

$$ROAit = \beta0 + \beta1SOIit + \beta2EVIit + \beta3ECIit + \beta4CGIit + + \beta5FZEit + \beta6LEVit + €it \quad 3.4$$

$$QTit = \beta0 + \beta1SOIit + \beta2EVIit + \beta3ECIit + \beta4CGIit + + \beta5FZEit + \beta6LEVit + €it \quad 3.5$$

ROA_{it} = Return on assets for firm i in year t
QT_{it} = Tobin's Q for firm i in year t
SOI_{it} = Social Sustainability Index for firm i in year t
EVI_{it} = Environmental Sustainability Index for firm i in year t
ECI_{it} = Economic Sustainability Index for firm i in year t
CGI_{it} = Corporate Governance Index for firm i in year t
FZE_{it} = Size of firm i in year t

LEV_{it}= Leverage of firm i in year t
€ = Error term
β_1 to β_6= coefficient of explanatory variables

Table 1. Measurement of Variables

Variables	Type	Measurements	Source
Tobin's Q	Endogenous	This is the ratio of (Price Market value of shares + Book value of liabilities) to the book value of assets of firms in a financial year.	Nirino *et al.* (2021)
Return on Assets	Endogenous	This is measured as the ratio of a firm's net income to total assets in a financial year.	Rahim (2024)
Environmental Sustainability Practices	Independent	Environmental sustainability is measured using a composite index that includes indicators related to environmental impact reduction, resource conservation, and sustainable production practices.	Saeed *et al.* (2025)
Social Sustainability Practices	Independent	Social sustainability is measured using a composite index that includes indicators related to social responsibility, employee welfare, community engagement, and human rights.	Nwaobia, & Omoniyi *et al.* (2025)
Economic Sustainability Practices	Independent	Economic sustainability is measured using indicators such as economic value added (EVA), revenue diversification, and stakeholder engagement in economic decision-making.	Okutu and Adegbie (2024)
Governance Sustainability Practices	Independent	Governance sustainability practices are measured by the corporate governance index (actual corporate governance score)	Wan *et al.* (2023)
Board Independence	Moderator	Ratio of independent members to total members on the corporate board	Wangui et al. (2020)
Board Size	Moderator	Total number of members on the corporate board	Rahim (2024)
Firm Size	Control	This is the natural logarithm of the total assets of firms in a financial year.	Panait *et al.,* (2023)
Leverage	Control	This is the ratio of total debt to total equity	Oyerogba *et al.* (2024)

Source: Researchers' Compilation, 2026

Results

Data were utilised from the annual reports of the listed oil and gas companies in Nigeria and Ghana on social sustainability, environmental sustainability, economic sustainability and governance sustainability, firm size, leverage, Return on assets and Tobin's Q between 2014 and 2024. The data generated for the study from the annual reports were analysed using panel regression estimates.

Table 2 Results from Descriptive Statistics (Nigeria)

	CGSI	ECSI	EVSI	FSIZE	LEV	QT	ROA	SOSI
Mean	1.961636	14.39545	4.036364	8.612273	93.3318	0.999818	6.443636	3.211818
Median	0.660000	7.070000	2.360000	8.868000	89.7300	0.790000	2.540000	3.450000
Maximum	23.75000	53.09000	16.88000	9.695000	254.750	3.950000	37.60000	4.020000
Minimum	0.020000	2.370000	0.460000	7.077000	76.2500	0.300000	0.230000	1.950000
Std. Dev.	3.800918	11.89989	3.891858	0.782843	24.0768	0.653496	6.877434	0.569500
Skewness	4.000770	0.887359	1.884924	-0.365596	5.66002	3.151181	1.970908	-0.712567
Kurtosis	21.65406	3.167092	5.868709	1.802543	38.2280	12.89580	8.812278	2.546658
Obs.	55	55	55	55	55	55	55	55

Source: Researcher's Computation (2026)

The sustainability indices show notable variations in practices among companies. The corporate governance sustainability index (CGSI) averages at a low 1.96, yet exhibits significant variability and extreme outliers, indicating that although many companies perform poorly, some show outstanding practices in governance-related sustainability. The economic sustainability index (ECSI) averages 14.40, showing significant variability, which suggests the level of economic responsibility initiatives differs greatly. Likewise, the environmental sustainability index (EVSI) has an average of 4.04, though certain companies indicate exceptionally high scores, revealing differences in environmental involvement. In comparison, the social sustainability index (SOSI) achieved an average score of 3.21, showing minimal differences among firms, indicating that companies in the sector are more uniform in their social responsibility efforts than in economic or environmental actions.

The average firm size is quite large, exhibiting moderate variation, whereas leverage is notably high, with an average of 93.33% and demonstrating instances of outliers where certain firms depend significantly on debt financing. This result aligns with the capital-based activities characteristic of oil and gas firms. Concerning financial performance, Tobin's Q typically was around 1.0, suggesting that market valuations often closely match book values for many companies, although some experience significantly higher valuations. Return on assets (ROA) is typically 6.4%, but the broad spectrum, with significant negative figures, emphasises fluctuations in profitability, possibly indicating the cyclical and risky characteristics of the oil and gas sector in Nigeria.

Table 3 Results from Descriptive Statistics (Ghana)

	CGSI	ECSI	EVSI	FSIZE	LEV	QT	ROA	SOSI
Mean	2.86309	18.7776	6.39490	7.37954	86.9621	1.34109	6.68836	2.92054
Median	2.19000	23.0300	3.13000	7.61100	86.3500	1.15000	6.06000	2.98000
Maximum	8.39000	44.4900	23.4300	8.67900	113.870	3.06000	21.7100	4.03000
Minimum	0.53000	-147.720	0.12000	6.25900	77.6600	0.01000	0.32000	1.85000
Std. Dev.	1.84817	24.8676	7.24694	0.81273	4.75750	0.66749	4.45731	0.72710
Skewness	1.08434	-5.55351	1.32604	-0.12467	3.20503	0.66709	1.06174	-0.20958
Kurtosis	3.41254	37.9702	3.24239	1.66814	19.9269	3.00190	4.23824	1.82025
Obs	55	55	55	55	55	55	55	55

Source: Researcher's Computation (2026)

The sustainability indicators indicated varied results. The corporate governance sustainability index (CGSI) shows an average of 2.86, with values ranging from 0.53 to 8.39, indicating moderate yet diverse levels of governance sustainability practices among companies. The economic sustainability index (ECSI) stands at an average of 18.78, similar to Nigeria; however, the large variation (standard deviation of 24.87) and the extreme minimum value (-147.72) indicate significant discrepancies in economic sustainability reporting, with some firms underperforming. The environmental sustainability index (EVSI) has an average of 6.39, surpassing Nigeria's score, yet the distribution is right-skewed, showing that while most companies score in the moderate range, a minority exhibits very high levels of environmental commitment. The social sustainability index (SOSI) averages 2.92, similar to Nigeria's figure, with low variability, indicating a more uniform approach to social initiatives across companies.

The average firm size is 7.38, showing minimal variation, indicating a degree of uniformity among publicly traded companies. Leverage averages 87%, aligning with the industry's capital-intensive characteristics, yet it shows considerable skewness and kurtosis, suggesting that some firms rely more on debt financing than others. Financial performance metrics indicate that Tobin's Q averages at 1.34, a bit higher than in Nigeria, suggesting that investors, on average, perceive Ghanaian oil and gas companies as valued slightly more than their book value. Return on assets (ROA) stands at 6.7%, minimally above the average in Nigeria. The range (0.32–21.71) and standard deviation (4.46) indicate considerable differences in profitability between companies.

Table 4 Results of Unit Root Test

Variables	Nigeria Levin, Lin, and Chu t			Ghana Levin, Lin, and Chu t		
	Intercept	Intercept and Trend	None	Intercept	Intercept and Trend	None
CGSI	0.0000**	0.0000**	0.0000**	0.0000**	0.0002**	0.0001**
ECSI	0.0012**	0.0001**	0.0154**	0.00396**	0.1493	0.0313**
EVSI	0.3832	0.2383	0.0000**	0.0000**	0.0000**	0.0004**
SOSI	0.1110	0.1774	0.0293**	0.2291	0.1492	0.0231**

***5% level of significance*
Source: Researcher's Computation, (2026)

Table 4 presents the findings of the Levin, Lin, and Chu (LLC) panel unit root test for the study variables in Nigeria and Ghana across three configurations: intercept, trend, and none. The findings indicate that most variables are stationary at the level for at least one specification, validating their appropriateness for regression analysis. In Nigeria, the corporate governance sustainability index (CGSI) remains consistently stable across all specifications, reflecting strong stability in practices related to governance. Economic sustainability (ECSI) remains stationary across all specifications, albeit with somewhat diminished significance (p = 0.0154 under "none"). Environmental sustainability (EVSI), however, is stationary only without deterministic elements (none, p = 0.0000), while it does not reject the null hypothesis under intercept and trend, indicating mixed evidence of stationarity. Social sustainability (SOSI) remains stationary solely under the "none" specification (p = 0.0293) but does not show stationarity under intercept or trend. This suggests that certain elements of sustainability practices, especially environmental and social, might show persistence or gradual adaptation in Nigeria.

In Ghana, comparable trends appear with a few distinctions. Corporate governance sustainability (CGSI) remains highly stable across various specifications in Nigeria, indicating uniformity in governance practices. Economic sustainability (ECSI) is stationary at intercept (p = 0.00396) and none (p = 0.0313), but is non-stationary under trend, indicating lesser stability in comparison to Nigeria. Environmental sustainability (EVSI) remains constant across all specifications, indicating that Ghanaian companies demonstrate more reliable environmental sustainability practices compared to Nigerian companies. Social sustainability (SOSI) is again only marginally stationary under the "none" specification (p = 0.0231), same as Nigeria, indicating increased volatility and persistence in social responsibility behaviours.

Hausman Specification Test

In panel data analysis, the examination of data over time, the Hausman test helps choose between a fixed effects model and a random effects model. The null hypothesis states that the preferred model is the random effect, while the alternative hypothesis states that the model has fixed effects. Essentially, the tests confirm whether there is a correlation between the model's regressors and the unique errors. The null hypothesis states that there is no correlation between the two. Consequently, if the p-value is negligible (less than 0.05), the null hypothesis ought to be disproved.

Table 5 Results from the Hausman Test

	Chi-Sq. Statistics	Prob.
NIGERIA		
ROA	6.100956	0.6359
Tobin's Q	6.968855	0.5400
GHANA		
ROA	7.846077	0.4486
Tobin's Q	9.997418	0.2652

Source: Researcher's Computation (2026)

Table 5 presents the results of the Hausman test for Nigeria and Ghana. In Nigeria, the analysis results in Chi-square values of 6.100956 (p = 0.6359) for ROA and 6.968855 (p = 0.5400) for Tobin's Q, neither of which are statistically significant at the 5% threshold. Likewise, for Ghana, the figures for ROA (7.8461, p = 0.4486) and Tobin's Q (9.9974, p = 0.2652) are likewise not significant. The absence

of significance in the models suggests that the random effects estimator is superior and more suitable than the fixed effects model for both nations. This indicates that variations at the firm level are effectively captured by random effects, enabling the study to continue with random effects panel estimation, while still implementing robust adjustments to tackle the previously identified cross-sectional dependence.

Test of Hypotheses

Hypothesis One

H_o1: Economic sustainability practices have no significant influence on the financial performance of listed oil and gas companies in Nigeria and Ghana.

Table 6 Economic Sustainability Practices and Return on Assets

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECSI	0.587033	0.088065	6.665898	0.0000
FSIZE	1.521793	1.200859	1.267254	0.2108
LEV	-0.009794	0.026458	-0.370184	0.7128
C	-14.19893	11.54494	-1.229883	0.2244

R-squared	0.774084	Mean dependent var	6.443636
Adjusted R-squared	0.760795	S.D. dependent var	6.877434
S.E. of regression	3.363656	Sum squared resid	577.0234
F-statistic	58.24923	Durbin-Watson stat	0.738264
Prob(F-statistic)	0.000000		

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECSI	0.055253	0.027911	1.979600	0.0532
FSIZE	-0.834690	0.741209	-1.126119	0.2654
LEV	-0.134105	0.093399	-1.435827	0.1572
C	23.47253	10.79576	2.174236	0.0344

R-squared	0.166551	Mean dependent var	6.688364
Adjusted R-squared	0.117525	S.D. dependent var	4.457313
S.E. of regression	4.187207	Sum squared resid	894.1676
F-statistic	3.397179	Durbin-Watson stat	0.717579
Prob(F-statistic)	0.024639		

Source: Researcher's Computation, (2026)

In Nigeria, the economic sustainability index (ECSI) coefficient is positive and highly significant ($\beta = 0.587$, $p = 0.000$), suggesting that stronger economic sustainability practices significantly boost firm profitability, as measured by ROA. The model accounts for approximately 77 % of the variability in profitability ($R^2 = 0.774$), and the overall regression is highly significant (F-statistic $p = 0.000$). Conversely, the findings from Ghana show a less robust connection. The ECSI coefficient is positive and slightly significant ($\beta = 0.055$, $p = 0.053$), indicating that practices related to economic sustainability have merely a minimal effect on a firm's profitability. The model's explanatory power is weak ($R^2 = 0.167$), yet the overall model is still statistically significant at the 5% level (F-statistic $p = 0.025$).

In the Nigerian sample, the economic sustainability index (ECSI) coefficient is positive, suggesting that practices related to economic sustainability generally enhance market valuation. The effect is also significant at the 5% threshold ($p = 0.000027$), indicating that economic sustainability improves firm performance. The general model fit is fair, showing an R^2 of approximately (0.3705%), and the F-statistic is significant ($p = 0.000027$), indicating that the explanatory variables together help to explain differences in market valuation among Nigerian oil and gas companies. In comparison, the findings from Ghana depict a significantly less favourable scenario. Even though the ECSI coefficient is positive, it lacks statistical significance ($p = 0.189$), suggesting that economic sustainability practices do not significantly impact Tobin's Q. The model's explanatory power is quite poor, exhibiting an R^2 of merely 0.06%, and the F-statistic indicates that the model overall is not significant ($p = 0.345$). Collectively, the results indicate that practices of economic sustainability are more significant in accounting for market valuation in Nigeria than in Ghana, although the impact in Nigeria remains limited.

Table 7 Economic Sustainability Practices and Tobin's Q

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECSI	0.056355	0.012010	4.692210	0.0000
FSIZE	0.499432	0.169233	2.951150	0.0048
LEV	-0.000121	0.002839	-0.042616	0.9662
C	-4.101388	1.620774	-2.530512	0.0145
R-squared	0.370580	Mean dependent var		0.999818
Adjusted R-squared	0.333556	S.D. dependent var		0.653496
S.E. of regression	0.533489	Sum squared resid		14.51511
F-statistic	10.00901	Durbin-Watson stat		0.710645
Prob(F-statistic)	0.000027			

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECSI	0.005022	0.003773	1.330912	0.1891
FSIZE	0.164557	0.115331	1.426815	0.1597
LEV	-0.016696	0.016445	-1.015310	0.3148
C	1.484393	1.767237	0.839952	0.4049
R-squared	0.062382	Mean dependent var		1.341091
Adjusted R-squared	0.007228	S.D. dependent var		0.667490
S.E. of regression	0.665074	Sum squared resid		22.55847
F-statistic	1.131048	Durbin-Watson stat		0.663607
Prob(F-statistic)	0.345310			

Source: Researcher's Computation, (2026)

Hypothesis Two

H_o2: Environmental sustainability practices have no significant influence on the financial performance of listed oil and gas companies in Nigeria and Ghana.

Table 8 Environmental Sustainability Practices and Return on Assets

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EVSI	0.431539	0.197268	2.187580	0.0333
FSIZE	-5.024349	1.078612	-4.658162	0.000
LEV	0.004020	0.014131	-0.284489	0.7772
C	48.34806	9.982606	4.843231	0.0000
R-squared	0.528028	Mean dependent var		6.443636
Adjusted R-squared	0.500265	S.D. dependent var		6.877434
S.E. of regression	4.861792	Sum squared resid		1205.488
F-statistic	19.01907	Durbin-Watson stat		0.790090
Prob(F-statistic)	0.000000			

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EVSI	-0.001419	0.085029	-0.016688	0.9868
FSIZE	-1.458997	0.704312	-2.071522	0.0434
LEV	-0.127138	0.098067	-1.296438	0.2007
C	28.52034	10.89040	2.618851	0.0116
R-squared	0.084664	Mean dependent var		6.688364
Adjusted R-squared	0.030820	S.D. dependent var		4.457313
S.E. of regression	4.388088	Sum squared resid		982.0210
F-statistic	1.572411	Durbin-Watson stat		0.514209
Prob(F-statistic)	0.207419			

Source: Researcher's Computation, (2026)

The regression findings analysing the effect of environmental sustainability practices (EVSI) on ROA in the oil and gas sector revealed different results for Nigeria and Ghana. In Nigeria, the EVSI coefficient is positive with statistical significance (β = 0.432, p = 0.033), indicating that initiatives for environmental sustainability meaningfully affect profitability. In general, the model's explanatory ability is quite moderate (R^2 = 0.528), and the F-statistic indicates that the model is significant (p = 0.000). This suggests that the combined effect of environmental sustainability, company size, and leverage significantly account for profitability in Nigerian oil and gas companies. In Ghana, the findings similarly indicate that EVSI has no notable effect on ROA (β = −0.001, p = 0.987). The model accounts for just 8% of the variability in ROA (R^2 = 0.085), and the overall model lacks statistical significance (F-statistic p = 0.207). In essence, the results indicate that environmental sustainability initiatives have no impact on profitability for firms in both Nigeria and Ghana. This suggests that in both cases, efforts toward environmental sustainability have not been successfully converted into monetary benefits, likely due to the substantial compliance costs and insufficient incentives for eco-friendly investments within the oil and gas industry.

Table 9 Environmental Sustainability Practices and Tobin's Q

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EVSI	0.031586	0.025212	1.252844	0.2160
FSIZE	-0.151426	0.142891	-1.059733	0.2943
LEV	0.000143	0.001408	0.101232	0.9198
C	2.163146	1.327878	1.629025	0.1095

R-squared	0.100866	Mean dependent var	0.999818
Adjusted R-squared	0.047975	S.D. dependent var	0.653496
S.E. of regression	0.637628	Sum squared resid	20.73503
F-statistic	1.907074	Durbin-Watson stat	0.462683
Prob(F-statistic)	0.140158		

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EVSI	-0.003806	0.013377	-0.284537	0.7772
FSIZE	0.108478	0.108283	1.001803	0.3212
LEV	-0.016163	0.016428	-0.983849	0.3298
C	1.970472	1.728644	1.139895	0.2597

R-squared	0.033925	Mean dependent var	1.341091
Adjusted R-squared	-0.022902	S.D. dependent var	0.667490
S.E. of regression	0.675091	Sum squared resid	23.24311
F-statistic	0.596986	Durbin-Watson stat	0.586312
Prob(F-statistic)	0.619888		

Source: Researcher's Computation, (2026)

The regression analysis regarding the effect of environmental sustainability practices (EVI) on market performance (Tobin's Q) shows that in Nigeria and Ghana, the connection is weak and not statistically significant. In Nigeria, the EVSI coefficient is positive yet insignificant (β = 0.032, p = 0.216), suggesting that environmental practices have no significant impact on market valuation. The model's explanatory capability is minimal (R^2 = 0.101), and the F-statistic (p = 0.140) verifies that the overall model is not significant. In Ghana, EVSI has a negative and statistically insignificant impact on Tobin's Q (β = −0.004, p = 0.777). The model's ability to explain variance is still limited (R^2 = 0.034), and the overall F-statistic is once more insignificant (p = 0.620).

Hypothesis Three

H_o3: Governance sustainability practices have no significant influence on the financial performance of listed oil and gas companies in Nigeria and Ghana.

Table 10 Governance Sustainability Practices and Return on Assets

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CGSI	0.812128	0.216040	3.759166	0.0004
FSIZE	-4.473987	0.835842	-5.352672	0.0000
LEV	0.012146	0.017120	-0.709479	0.4813
C	44.51536	7.365435	6.043819	0.0000

R-squared	0.653800	Mean dependent var	5.987209
Adjusted R-squared	0.633436	S.D. dependent var	6.818464
S.E. of regression	4.128209	Sum squared resid	869.1474
F-statistic	32.10462	Durbin-Watson stat	1.032372
Prob(F-statistic)	0.000000		

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CGI	1.826191	0.251634	7.257320	0.0000
FSIZE	0.054293	0.573177	0.094724	0.9249
LEV	-0.093168	0.091325	-1.020178	0.3125
C	9.161265	9.468605	0.967541	0.3378

R-squared	0.581807	Mean dependent var	6.688364
Adjusted R-squared	0.557208	S.D. dependent var	4.457313
S.E. of regression	2.966014	Sum squared resid	448.6591
F-statistic	23.65112	Durbin-Watson stat	1.274686
Prob(F-statistic)	0.000000		

Source: Researcher's Computation, (2026)

Table 11 Governance Sustainability Practices and Tobin's Q

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CGSI	0.126269	0.017477	7.224811	0.0000
FSIZE	0.017873	0.094949	0.188234	0.8514
LEV	-4.22E-05	0.001530	-0.027607	0.9781
C	0.602143	0.849417	0.708889	0.4816

R-squared	0.527697	Mean dependent var	0.993773
Adjusted R-squared	0.499915	S.D. dependent var	0.652894
S.E. of regression	0.461705	Sum squared resid	10.87176
F-statistic	18.99387	Durbin-Watson stat	1.087102
Prob(F-statistic)	0.000000		

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CGSI	0.110698	0.055005	2.012513	0.0495
FSIZE	0.199541	0.107210	1.861208	0.0685
LEV	-0.014003	0.015640	-0.895324	0.3748
C	0.769345	1.720676	0.447118	0.6567

R-squared	0.113677	Mean dependent var	1.341091
Adjusted R-squared	0.061540	S.D. dependent var	0.667490
S.E. of regression	0.646625	Sum squared resid	21.32434
F-statistic	2.180364	Durbin-Watson stat	0.576930
Prob(F-statistic)	0.101668		

Source: Researcher's Computation, (2026)

In Nigeria, the corporate governance index (CGI) has a positive and significant correlation with ROA (coefficient = 0.81212, prob. = 0.0004< 0.05), highlighting the favourable effect of governance sustainability on improving firm profitability. The model's explanatory ability featured an R^2 of 0.653 and an adjusted R^2 of 0.633, indicating that governance sustainability accounts for more than 50 percent of the variability in financial performance. The overall model shows a statistically significant fit (F-statistic = 32.10, prob. = 0.0000 < 0.05). In Ghana, the influence of governance sustainability on performance seems to be even more pronounced. The CGI coefficient stands at 1.8262 (prob.= 0.000 < 0.05), surpassing Nigeria's, indicating that advancements in governance sustainability result in higher asset returns for firms in Ghana. The explanatory capability is significantly greater than in Nigeria, featuring an R^2 of 0.582 and an adjusted R^2 of 0.557, indicating that more than half of the variation in RoA is accounted for by the model. The F-statistic (23.65, prob.= 0.000 < 0.05) indicates substantial overall significance.

The regression results highlight the differential effect of governance sustainability practices on market-based performance across Nigeria and Ghana. For Nigeria, the corporate governance index (CGI) exerts a strong and highly significant positive influence on Tobin's Q (coefficient = 0.126, p= 0.000 < 0.05), indicating that effective governance sustainability practices enhance firm value as perceived by investors. The model explains about 53% of the variation in Tobin's Q (R^2 = 0.5276) and is overall significant (F-statistic = 18.99, p < 0.05). In Ghana, governance also has a positive and significant impact on Tobin's Q (coefficient = 0.111, p < 0.05), although the effect is weaker relative to Nigeria. The explanatory power of the Ghanaian model is relatively low (R^2 = 0.114, adjusted R^2 = 0.062), and the overall model is not statistically significant (F-statistic = 2.18, p = 0.102).

Hypothesis Four

H_o4: Social sustainability practices have no significant influence on the financial performance of listed oil and gas companies in Nigeria and Ghana.

Table 12 Social Sustainability Practices and Return on Assets

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOSI	9.092152	3.513141	2.588040	0.0125
FSIZE	-12.20247	2.577360	-4.734484	0.0000
LEV	0.002625	0.018516	0.141789	0.8878
C	82.08728	11.81840	6.945717	0.0000
R-squared	0.565720	Mean dependent var		6.443636
Adjusted R-squared	0.540174	S.D. dependent var		6.877434
S.E. of regression	4.663618	Sum squared resid		1109.216
F-statistic	22.14528	Durbin-Watson stat		0.934626
Prob(F-statistic)	0.000000			

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOSI	2.384870	1.364525	1.747766	0.0865
FSIZE	-3.170545	1.173558	-2.701652	0.0093
LEV	-0.074087	0.102257	-0.724516	0.4721
C	29.56316	11.04786	2.675917	0.0100
R-squared	0.133219	Mean dependent var		6.688364
Adjusted R-squared	0.082232	S.D. dependent var		4.457313
S.E. of regression	4.270116	Sum squared resid		929.9285
F-statistic	2.612794	Durbin-Watson stat		0.491358
Prob(F-statistic)	0.061227			

Source: Researcher's Computation, (2026)

The results show that social sustainability practices (SOSI) have a positive and statistically significant effect on ROA (β = 9.092, p = 0.0125). The explanatory power of the model is moderate (R^2 = 0.565720; adjusted R^2 = 0.5401), and the overall model has significance (F-statistic p = 0.0000). This

implies that social sustainability practices contribute meaningfully to the accounting performance (RoA) of oil and gas firms in Nigeria. For Ghana, the results present a different picture. Social sustainability practices (SOSI) have a positive and insignificant effect on ROA (β = 2.385, p = 0.087), suggesting an immaterial contribution of social initiatives to profitability. The explanatory power of the model is also low (R^2 = 0.133) as shown in the Nigerian context.

Table 13 Social Sustainability Practices and Tobin's Q

NIGERIA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOSI	1.162073	0.414289	2.804978	0.0071
FSIZE	-1.015149	0.294063	-3.452153	0.0011
LEV	0.001688	0.001775	0.950987	0.3461
C	5.852610	1.361581	4.298393	0.0001
R-squared	0.221867	Mean dependent var		0.999818
Adjusted R-squared	0.176095	S.D. dependent var		0.653496
S.E. of regression	0.593173	Sum squared resid		17.94459
F-statistic	4.847179	Durbin-Watson stat		0.559119
Prob(F-statistic)	0.004823			

GHANA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SOSI	0.994046	0.169135	5.877220	0.0000
FSIZE	-0.605495	0.149402	-4.052779	0.0002
LEV	0.006037	0.016435	0.367305	0.7149
C	2.381252	1.587016	1.500459	0.1397
R-squared	0.408422	Mean dependent var		1.341091
Adjusted R-squared	0.373623	S.D. dependent var		0.667490
S.E. of regression	0.528278	Sum squared resid		14.23297
F-statistic	11.73670	Durbin-Watson stat		0.788306
Prob(F-statistic)	0.000006			

Source: Researcher's Computation, (2026)

The findings indicate that social sustainability practices (SOSI) exhibit a positive and statistically significant correlation with Tobin's Q (β = 1.162073, p = 0.0071). The model accounts for 22 per cent of the variation in Tobin's Q (R^2 = 0.2218), and the overall regression is statistically significant (F statistic, p = 0.0048). This implies that in Nigeria, social sustainability practices have an impact on market performance as measured by Tobin's Q. In the same vein, the findings for Ghana are notable. Social sustainability practices (SOSI) significantly and positively impact Tobin's Q (β = 0.994, p < 0.001), indicating that companies with more robust social initiatives experience greater market valuations. The model's explanatory power is considerable (R^2 = 0.408; adjusted R^2 = 0.374), and it is statistically significant (F-statistic, p < 0.001). This shows that social sustainability significantly influences market-based performance in Ghana.

Discussion of Findings

Economic Sustainability Practices and Financial Performance

Hypothesis one showed an interesting difference between Nigeria and Ghana concerning the relationship between economic sustainability practices and RoA. In Nigeria, the findings indicate a robust and significantly notable relationship between the Economic Sustainability Index (ECSI) and return on assets (RoA). This result indicates that when oil and gas firms incorporate economic sustainability into their practices, via cost-effectiveness, resilient supply chains, clear procurement, and wise resource distribution, they realise significant gains in profitability. The magnitude of the outcome suggests that economic sustainability practices are not just symbolic actions for compliance or image, but instead act as key contributors to financial performance. These practices decrease operating expenses, lessen the chances of interruptions, strengthen community ties via local content consistency,

and decrease funding costs by boosting the trust of the financiers. The evidence from Nigeria, thus, strengthens the claim that sustainability acts as a strategic asset that improves competitiveness and yields quantifiable financial benefits.

In contrast, the findings from Ghana showed a minimal impact on RoA; this suggests that, although the relationship's direction aligns with Nigeria, the profitability benefits linked to economic sustainability in Ghana are significantly less evident. This indicates that companies in Ghana might still be in the initial phase of integrating sustainability practices, suggesting that the financial advantages have not yet had enough time to appear. Moreover, a greater dependence on exploratory ventures or newer resources might render returns more susceptible to geological and price fluctuations than to gradual efficiency improvements from sustainability efforts. Additionally, the institutional capacity and supply-chain development in Ghana might still be insufficient to convert sustainability pledges into concrete enhancements in asset productivity and profitability. The assessment of market performance, indicated by Tobin's Q, further emphasises international variations in the financial impacts of practices related to economic sustainability. In the Nigerian sample, the economic sustainability index (ECSI) shows a positive and statistically significant impact on Tobin's Q, indicating that the capital market views sustainability-focused practices as enhancing value. This discovery suggests that investors in Nigeria appreciate the lasting advantages of economic sustainability, rewarding companies that incorporate these practices into their operations with elevated market valuations compared to their asset base. By demonstrating operational efficiency, lower risk exposure, and improved legitimacy with regulators and local communities, companies with robust sustainability profiles seem more appealing to both national and global investors. This reinforces the idea that sustainability acts as both an internal performance motivator and a crucial external indicator influencing market confidence and investor expectations.

Conversely, the findings from Ghana present a less positive scenario. While the ECSI coefficient remains positive, it fails to reach statistical significance, suggesting that the market does not distinctly link economic sustainability practices to increased firm value in this scenario. This lack of importance may indicate lower levels of capital market depth and efficiency in Ghana, where sustainability disclosures and practices may not yet be fully factored into investors' decisions. It might also indicate a gap between announced sustainability efforts and their perceived reliability or significant effect on company performance. The outcomes are in tandem with (Alsayegh, 2020; Ali *et al.,* 2023; Akerele *et al.,* 2024; Oyerogba *et al.,* 2024); but disagree with the findings of (Onyinye *et al.,* 2024; Kong *et al.,* 2023).

Environmental Sustainability Practices and Financial Performance

The findings on environmental sustainability practices showed a similar situation to that of economic sustainability. In Nigeria, the EVSI coefficient is positive and statistically significant, indicating that existing environmental initiatives significantly enhance firm profitability. In Ghana, the impact of EVSI on ROA is minimal, as the coefficient is nearly zero and lacks statistical significance. These results suggest that environmental sustainability initiatives in Nigeria have evolved into profit generators in the oil and gas sector more than in the case of Ghana. Multiple elements may provide insight into this result. Environmental initiatives typically require significant initial expenditures, such as investments in technologies that reduce emissions, waste management systems, and pollution control measures, which might not yield immediate financial gains in Ghana. In Nigeria, strong enforcement strategies and sufficient focus from investors on environmental disclosure might have contributed to the motivation for companies to synchronise environmental practices with profit objectives. Consequently, environmental efforts remain primary and are essential components of corporate strategy. In the case of Ghana, where companies also function under significant cost pressures and unstable market environments, these expenditures may be viewed as regulatory requirements rather than strategic investments. Also, limited visibility into long-term benefits, such as boosted reputation, increased stakeholder trust, or reduced environmental risk exposure, suggests that the financial advantages of environmental sustainability are difficult to quantify using short-term accounting metrics like RoA. This discovery stands in stark contrast to the evident profitability advantages in the context of Nigeria, highlighting the inconsistent routes through which various aspects of sustainability affect corporate performance in both nations. The results imply that, although environmental initiatives are crucial for sustainable resilience and adherence to regulations, their immediate effect on short-term profitability is favourable in Nigeria but still restricted in Ghana.

The regression findings on the impact of environmental sustainability practices (EVI) on market performance, as indicated by Tobin's Q, show a persistently weak, statistically insignificant correlation in both Nigeria and Ghana. This indicates that, in contrast to economic sustainability, environmental efforts have not resulted in observable enhancements in companies' market valuations within the oil and gas industries of both countries. The lack of significance suggests that investors do not incorporate

environmental practices into their evaluations of firm value, at least not in a clear or measurable way. Multiple reasons could explain this trend. Environmental investments typically require substantial initial expenditures, with advantages that accumulate over extended periods, rendering them less apparent to markets focused on short- to medium-term gains. In scenarios where capital markets are underdeveloped and sustainability reporting is inadequate, such long-term signals might not affect investor views. Also, inadequate regulatory enforcement and varying reporting standards can diminish the credibility of environmental efforts, hindering them from acting as trustworthy indicators of corporate value. In economies reliant on resources such as Nigeria and Ghana, investors might focus on short-term operational efficiency and profits rather than environmental responsibilities, particularly in sectors where compliance is often seen as an expense instead of a competitive edge. The results suggest that environmental sustainability practices have not yet become significant value-relevant elements in capital market evaluations in either country. This differs from the significant market acknowledgement of economic sustainability seen in Nigeria, where Tobin's Q reacted favourably to these practices. The outcomes are in tandem with (Ezeh, 2024; Fei *et al.,* 2024; Chukwuebuka & Okenwa, 2023; Aslan *et al.,* 2021; Adekola & Akinnuli, 2021); but not in line with the discovery of (Asongu & Odhiambo, 2021; Adebayo & Ibrahim, 2022; Adams et al., 2022).

Governance Sustainability Practices and Financial Performance

The findings on governance sustainability clearly demonstrate its significant effect on improving firm profitability (RoA) in both Nigeria and Ghana. In Nigeria, the corporate governance index (CGI) shows a strong and significantly positive correlation with Return on assets (ROA), indicating that enhanced governance practices, like board effectiveness, transparency, accountability, and stakeholder involvement, lead to better profitability. This highlights that effective governance practices lower agency costs, improve managerial discipline, and promote an accountable culture, all of which lead to better resource allocation and enhanced operational performance. In Ghana, the impact of sustainable governance on business performance seems to be even more significant. The CGI coefficient exceeds Nigeria's estimate and suggests that enhancements in governance systems provide even more substantial benefits regarding asset profitability. This discovery indicates that Ghanaian oil and gas companies might gain unequal advantages from enhancing governance practices, likely due to governance reforms tackling more urgent institutional and structural issues. In environments where regulatory frameworks, protection for investors, and board autonomy are still evolving, improvements in governance can lead to greater advancements in investor trust, accountability of management, and ultimately, financial results. These results highlight the importance of governance sustainability in influencing company profitability in both nations. Although Nigeria demonstrates distinct advantages, Ghana's higher coefficient suggests that improvements in governance can be particularly transformative in environments with greater institutional deficiencies, enabling oil and gas firms to benefit more from the legitimacy and efficiency that governance fosters. The wider implication is that sustainable governance is not just a compliance obligation but a strategic tool for financial success. For managers, this implies that focusing on clear reporting, strong board practices, and aligning with stakeholders can enhance profitability directly. For lawmakers and regulators, the findings emphasise the need to strengthen governance codes, enforce adherence, and foster conditions where effective governance is consistently recognised and rewarded.The findings align with the works of (Adeneye *et al.,* 2023; Asongu & Odhiambo, 2021; Duque-Grisale & Aguilera-Caracuel, 2021) but contradict the findings of (Habib, 2022; Firede, 2019; Friede *et al.,* 2015).

The regression analysis looking into the impact of governance sustainability on market performance (Tobin's Q) shows that governance sustainability significantly influences firm value in Nigeria and Ghana. For oil and gas companies listed in Nigeria, the discovery suggests that strong governance frameworks, such as clear disclosure practices, capable and independent boards, compliance with regulatory standards, and improved accountability, are well-received by investors and reflected in increased market values. This indicates that Nigerian capital markets favour companies that implement strong governance structures, viewing these practices as indicators of lower agency risk, enhanced decision-making quality, and better safeguarding of shareholder interests. In Ghana, the findings also verify that governance sustainability positively and significantly affects Tobin's Q, although the strength of the effect is somewhat less than in Nigeria. This implies that although investors in Ghana appreciate governance enhancements, the robustness of the capital market and the effectiveness of supporting institutional frameworks could influence the degree to which governance impacts firm value. Still, the statistical importance of the relationship highlights that, even in smaller or less developed markets, corporate governance continues to be a vital factor influencing investor confidence and market views. The results emphasise that the sustainability of governance is significant in both accounting-related and market-related performance metrics. While profitability (RoA) advantages seem more significant in

Ghana, market valuation (Tobin's Q) effects are clearer in Nigeria, indicating that the ways in which governance improves firm performance vary by context. The main takeaway is that stakeholders consistently prioritise effective governance, internally by boosting efficiency and accountability, and externally by increasing investor confidence, rendering it a crucial factor in firm performance in both nations. The findings align with the works of (Adeneye *et al.,* 2023; Asongu & Odhiambo, 2021; Duque-Grisale & Aguilera-Caracuel, 2021) but contradict the findings of (Habib, 2022; Firede, 2019; Fried *et al.,* 2015).

Social Sustainability Practices and Financial Performance

The results regarding social sustainability practices (SOSI) show a varied and context-specific relationship with company performance. In Nigeria, the findings show that SOSI positively impacts Return on assets (RoA), although the effect is not statistically significant in Ghana. This indicates that in Nigeria, socially focused initiatives like employee welfare, community involvement, corporate social responsibility efforts, and stakeholder inclusivity can foster goodwill and operational cohesion, directly leading to short-term profits. The lack of statistical significance in Ghana indicates that these practices, while useful for preserving stakeholder legitimacy, do not have a measurable effect on the accounting-based performance of firms. This corresponds with previous evidence that the financial advantages of social investments tend to be widespread, long-term, and challenging to quantify using conventional profitability measures. Furthermore, in Nigeria, SOSI has a positive and statistically significant impact on Tobin's Q, suggesting that investors view social sustainability efforts as beneficial within the capital market. This might stem from viewing these initiatives as income-generating efforts that directly enhance operational efficiency or profitability. In situations where investors prioritise long-term gains, spending on social responsibility is seen as value-generating expenses with substantial financial rationale.

In the same way, findings from Ghana indicate that SOSI positively and significantly impacts Tobin's Q, implying that investors incentivise companies involved in social sustainability efforts. This suggests that Ghanaian markets perceive social initiatives as indicators of long-term resilience, stakeholder trust, and diminished social risk rather than as financial burdens. In a landscape where community ties and social legitimacy are essential for ongoing operations, companies that show reliable commitments to social sustainability might secure a competitive advantage in garnering investor trust and maintaining positive market valuations. Overall, these findings highlight that social practices do not have a direct effect on profitability in both nations, yet their impact on market valuation differs; it is negative and insignificant in Nigeria, while in Ghana it is positive and significant. This difference indicates that in Ghana, capital markets are becoming more attentive to companies' social responsibilities, possibly showing heightened awareness of stakeholder relationships and reputational assets. For Nigeria, the findings suggest that a closer connection between social initiatives and operational or strategic results may be necessary before investors see these practices as valuable. The findings align with the works of (Omar & Ilham, 2025; Habib, 2023; Wan *et al.,* 2023) but contradict the findings of (Kilincarslan *et al.,* 2020; Benni, 2023; AlAjmi *et al.,* 2023).

Implications for Developed Economies and Global Sustainability Debate

The results go beyond Nigeria and Ghana and add to the wider global discussion on sustainability practices. We should recall from the findings that sustainability factors do not influence company performance in a consistent manner; governance sustainability influenced both accounting and market performance in the two nations, but the effects of environmental, economic, and social sustainability vary based on institutional quality, market maturity, and stakeholder expectations. This outcome reinforces the increasing worldwide perspective that sustainability practices should not be regarded as a uniform concept, since various pillars create distinct value results based on the environment in which businesses operate.

In Europe and other advanced economies (Panait et al., 2023; Asongu & Odhiambo, 2021; Kilincarslan et al., 2020), sustainability regulations and reporting, and stakeholder activism are more developed, the results underline the significance of governance quality as the basis through which other sustainability efforts convert into financial value. The consistent and significant effect of governance sustainability seen in both countries indicates that, even in rigorously regulated markets, effective governance is needed for improving accountability, lowering agency costs, and protecting investor confidence. As a result, companies in advanced economies might gain more advantages by ensuring that strong governance frameworks support environmental and social initiatives. Moreover, the minimal influence of environmental sustainability on market valuation in both nations contributes significantly to the ongoing global ESG discussion. While environmental practices are often touted as catalysts for sustainable value, the evidence suggests that investors may not quickly recognise these efforts, especially

when the financial gains materialise over a longer period. This consequence is equally applicable to advanced economies, where growing concerns have emerged about whether environmental expenditures generate immediate shareholder value or merely meet regulatory and stakeholder demands. The evidence thus indicates that the value of environmental sustainability is expected to be appreciated gradually rather than immediately. In the same vein, the varied outcomes regarding social sustainability suggest that the recognition of social investments in the market depends on the level of stakeholder awareness and public expectations. This observation aligns with ongoing discussions in Europe and North America (Lisin et al., 2022) about assessing and valuing social capital, employee well-being, diversity, and community involvement. The results suggest that the advantages of social sustainability are mainly influenced by context and are likely to manifest more strongly in reputational gains and long-term resilience than in short-term profits.

Conclusion

The findings concluded that economic sustainability practices greatly improve both accounting-based (RoA) and market-based (Tobin's Q) performance metrics in Nigerian oil and gas companies, whereas their effect is statistically insignificant in Ghanaian firms. The study found out that environmental sustainability positively impacted RoA in Nigeria, but it had no significant effect on performance metrics in Ghana. Also, the study concluded that governance sustainability influenced firm performance in both nations, highlighting the importance of efficient governance structures in driving financial performance. Additionally, social sustainability practices enhanced firm performance in Nigeria, whereas their impact in Ghana was insignificant on RoA but significant on Tobin's Q.

Based on the conclusion, the paper recommends the following:

Oil and gas businesses in Ghana need to bolster cost-efficiency, optimise resources, and focus on long-term investment strategies. Policymakers should promote sustainable financial practices and clear reporting to boost investor trust. Nigerian oil and gas companies must persist in enhancing their commitment to economic sustainability to maintain profitability and market value.

Given that environmental sustainability positively influenced RoA in Nigeria but negatively impacted it in Ghana, oil and gas companies in Ghana need to adopt more aggressive environmental strategies, stronger pollution management, and renewable energy practices to meet international benchmarks. Regulatory agencies in each country must implement stricter environmental compliance and reporting to guarantee that sustainability leads to quantifiable financial benefits.

Oil and gas companies in Nigeria and Ghana should enhance their corporate governance structures, promoting transparency, accountability, and ethical leadership. Board committees dedicated to sustainability must be given the authority to supervise the integration of environmental, social, and governance (ESG) factors into corporate strategy.

Given that social sustainability had a significant effect in Nigeria but varied results in Ghana, firms in Ghana need to improve stakeholder involvement, community development initiatives, and employee welfare schemes to foster social trust and sustainable value. Nigerian companies need to sustain and grow their social investments, as these play a vital role in both financial and market performance metrics.

Research limitations and suggestions for future research

This research, while valuable, has some limitations. First, the analysis is confined to publicly traded oil and gas companies in Nigeria and Ghana, which restricts the applicability of the results to different industries and regional settings. Secondly, variations in sustainability reporting practices, disclosure quality, and institutional contexts may influence the comparability of ESG information across companies and nations. Third, the research relies on ROA and Tobin's Q, which may not fully capture the long-term benefits of sustainability investments.

Subsequent studies should expand their focus by incorporating companies from different industries and nations, especially advanced economies in Europe and North America, to enable international comparisons and enhance external validity. Additional research might utilise different ESG metrics and additional performance indicators to offer deeper insights into whether the relationship between sustainability practices and company performance is universal or varies by context.

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