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THE IMPACT OF ESG PRACTICES ON THE RISK PORTFOLIO OF LISTED OIL AND GAS FIRMS IN NIGERIA USING A MULTILAYERED CRITERION

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Abstract
This study investigates the impact of Environmental, Social, and Governance (ESG) factors on the risk-adjusted returns of Nigerian oil and gas firms listed on the Nigerian Exchange Group (NGX) over a 11-year period (2012–2022). The study was anchored on signalling theory. Utilizing a correlational research design, data was collected from eight firms meeting inclusion criteria, focusing on ESG scores as independent variables, with Firm Size as a control variable, and risk-adjusted returns as the dependent variable. Diagnostic tests ensured adherence to Best Linear Unbiased Estimator (BLUE) assumptions. Employing both Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) regression techniques, the study addresses potential endogeneity, using industry norms as an instrumental variable (IV) in the 2SLS model. Findings indicate significant, positive relationships between ESG factors and risk-adjusted returns, emphasizing the financial viability of sustainable practices in a sector known for environmental and social risks. Hence, to strengthen financial and operational resilience, Nigerian oil and gas firms are encouraged to prioritize robust environmental practices, including emission reduction, waste management, and prevention of oil spills. Given the social challenges in regions like the Niger Delta, firms should focus on building trust and maintaining positive relationships with local communities through initiatives in healthcare, education, and infrastructure. This study provides key insights into how ESG engagement in Nigerian oil and gas firms may influence firm stability, resilience, and investor confidence, underscoring the role of signalling theory in linking ESG performance to enhanced corporate valuation.

Keywords: ESG practices, risk portfolio, multilayered criterion, listed oil and gas firms

1.0 Introduction

In the late 1970s, global awareness of environmental issues like deforestation and pollution led to key milestones, such as the Brundtland Commission's 1987 concept of sustainable development. This approach emphasizes meeting present needs without compromising future generations, balancing economic growth, social progress, and environmental protection. The 1990s shifted focus to social challenges like poverty and corruption, culminating in the 1992 Earth Summit, where world leaders committed to sustainable and responsible resource management (Alshehhi et al., 2018; Brundtland, 1987). The rise of Environmental, Social, and Governance (ESG) criteria has provided a structured approach for companies to implement sustainable and responsible business practices.

Despite the challenges of standardizing ESG reporting and the risk of green emission, strong ESG practices are increasingly seen as vital for companies seeking a competitive edge and long-term viability in today's business landscape (Cort & Esty, 2020; Johnson et al., 2019; Khanchel & Lassoued, 2022; Prabawati & Rahmawati, 2022). As companies face environmental, social,

and governance challenges, ESG criteria provide investors with a holistic view of potential risks and opportunities that extend beyond conventional metrics, aligning investments with societal values (Maiti, 2021; Songwe & Coulibaly, 2019). Research by Kumar (2023) and Maiti (2021) indicates that ESG factors offer a strategy promoting long-term sustainability and competitiveness. Environmental and social responsibilities help firms meet regulatory standards and consumer expectations, mitigating risks tied to ecological impacts and reputation.

As stakeholders increasingly prioritize corporate responsibility, adopting ESG principles strengthens public trust and positively influences corporate reputation. In particular, the environmental dimension of ESG, as highlighted by Bandeira et al. (2023), emphasizes carbon emissions and resource efficiency, enhancing compliance with international and domestic mandates. Consequently, the transparency driven by ESG practices reinforces both regulatory adherence and reputational resilience, satisfying investor expectations for ethical governance and aligning with broader environmental standards.

On an operational level, integrating ESG frameworks promotes efficiency through innovative resource utilization and reductions in ecological footprints, resulting in cost savings and performance optimization (Ramírez-Orellana et al., 2023; Martto et al., 2023). This operational improvement mitigates environmental risks and reinforces investor confidence by demonstrating proactive engagement in sustainable practices. As Dsouza and Krishnamoorthy (2024) suggest, aligning with ESG standards helps firms avoid potential sanctions, enabling sustained compliance in a rigorously regulated sector. The adoption of ESG principles supports firms in reducing environmental liabilities and operational costs through improved resource management (Dsouza & Krishnamoorthy, 2024). ESG risks can reduce capital costs since investors may require lower returns when firms demonstrate strong ESG commitments (Korneeva et al., 2023). This cost reduction is essential in the capital-intensive oil and gas sector, where shifting investor sentiment can significantly impact financial performance.

Emeka-Okoli et al. (2024) opine that strategic incorporation of ESG factors within the firms in Nigerian especially oil and gas, which is one the highly environmental sensitive could transcend traditional compliance measures and engenders a proactive framework for mitigating environmental risks. This alignment not only mitigates potential penalties for environmental infractions but also enhances the firms' reputation as responsible corporate entities that prioritize sustainable practices. Regulatory alignment in Nigerian oil and gas firms could be achieved through harmonizing operations with stringent global and local environmental standards, which allows firms to navigate evolving legislation proactively (Gorshkov, 2024; Bandeira et al., 2023). This forward-looking approach reduces susceptibility to legal risks, safeguarding operational integrity while meeting stakeholder expectations for transparency and sustainability

The strategic integration of ESG principles thus transforms Nigerian oil and gas firms by embedding a holistic risk management framework that addresses regulatory, reputational, and operational vulnerabilities (Korneeva & Kozhuhova, 2024; Szczepańczyk et al., 2023). This sophisticated approach revitalizes traditional risk management by aligning corporate actions with stakeholder demands for accountability and environmental stewardship. Social governance protocols reinforce community relationships, reducing social risks and supporting project sustainability, while ESG-driven technological advancements improve operational efficiency and reduce environmental impact. Consequently, this strategy not only addresses immediate regulatory challenges but also strengthens Nigerian oil and gas firms' long-term viability in an

increasingly eco-conscious global market. As Emeka-Okoli, Nwankwo, and Otonnah (2024), elaborate ESG factors goes beyond compliance, fostering a proactive framework for managing environmental risks. This alignment with progressive regulations helps mitigate potential penalties and reinforces the firms' reputations as responsible corporate players committed to sustainability.

This ESG alignment also allows firms to respond effectively to international regulatory standards and societal demands for cleaner energy practices, thus broadening access to foreign investments and fortifying corporate resilience (Ramírez-Orellana et al., 2023; Gorshkov, 2024). As it enables Nigerian oil and gas companies to not only manage reputational risks but also attract socially conscious investors and meet international benchmarks for sustainable practices (Dsouza & Krishnamoorthy, 2024). By embedding ESG into their financial frameworks, these firms achieve a competitive edge and contribute significantly to Nigeria's sustainable development goals, positioning themselves as leaders in the transition towards a sustainable energy landscape where economic prosperity is harmonized with environmental stewardship (Ramírez-Orellana et al., 2023; Korneeva et al., 2023).

This study fills a critical gap in the literature by examining the nuanced impact of ESG practices on the risk portfolio of listed oil and gas firms in Nigeria, a sector marked by significant environmental, social, and governance challenges. Despite global shifts towards ESG integration, existing research primarily centers on developed markets, overlooking emerging economies where regulatory frameworks and stakeholder expectations differ. By analyzing the interplay between ESG practices and risk variables within the context of a developing oil-dependent economy, this study provides insights into how proactive ESG strategies can mitigate regulatory, reputational, and operational vulnerabilities specific to Nigerian firms. Additionally, employing a multilayered regression model and a two-stage least squares (2SLS) approach to address potential endogeneity offers a robust methodology that can more accurately capture the causal relationships between ESG factors and risk metrics. This contribution not only aids in understanding ESG's role in shaping financial and operational resilience in the Nigerian oil and gas sector but also offers a framework for policymakers and industry stakeholders seeking to foster sustainable practices in similar emerging markets

2.0 Literature Review

Research on sustainable investments tends to emphasize enhanced returns and portfolio performance associated with ESG factors, often overlooking comprehensive risk assessments. Studies by Deutsche Bank (2012), Eccles et al. (2012), Borgers et al. (2013), and Allianz Global Investors (2015) indicate that companies with high ESG standards generally enjoy improved financial and stock performance. However, these studies tend to assume a direct relationship between ESG integration and reduced risk, without exploring the full risk implications. Some works suggest that ignoring ESG criteria could compromise fiduciary responsibilities, particularly in pension funds, yet focus remains on ESG's potential for superior risk-adjusted returns rather than on detailed risk impacts (Alshehhi et al., 2018; Brundtland, 1987). ESG has become particularly relevant in regulated industries, such as Nigerian oil and gas, where ESG integration fosters a proactive framework for managing environmental and reputational risks (Emeka-Okoli et., 2024).

Aligning ESG standards with industry practices strengthens firms' resilience to regulatory changes, enhances operational efficiency, and supports sustainable development goals by

promoting transparency, community relations, and resource efficiency (Gorshkov, 2024; Bandeira et al., 2023; Ramírez-Orellana et al., 2023; Martto et al., 2023). Research suggests that robust ESG practices reduce capital costs, as investors increasingly favor firms demonstrating strong ESG commitments, especially in capital-intensive sectors like oil and gas (Korneeva et al., 2023; Khanchel & Lassoued, 2022; Prabawati & Rahmawati, 2022). Furthermore, strategic ESG integration supports corporate resilience, broadens international investment opportunities, and enhances public trust by aligning operations with global standards (Szczepańczyk et al., 2023; Johnson et al., 2019).

ESG-driven governance and community engagement have been shown to reduce sociopolitical conflicts, improve project viability, and promote long-term corporate sustainability (Maiti, 2021; Songwe & Coulibaly, 2019; Dsouza & Krishnamoorthy, 2024; Kumar et al., 2016). ESG in Nigerian oil and gas firms mitigates regulatory penalties and positions them as responsible corporate entities, meeting both domestic mandates and international environmental expectations (Cort & Esty, 2020; Bandeira et al., 2023). According to Morgan Stanley (2015) and Eccles et al. (2012), quantitatively link ESG factors to reduced portfolio volatility. Specifically, Morgan Stanley noted that sustainable mutual funds exhibit similar or lower volatility than traditional funds in 64% of periods studied. For sustainable investments to reach mainstream status, however, further quantitative analysis is needed on ESG's influence on risk and stock return volatility.

Theoretical Framework

Signaling theory was initially developed by economist Michael Spence in 1973. Spence introduced the theory to explain how individuals, particularly in the job market, signal their abilities and qualities to others. Signaling theory proposes that proactive ESG engagement acts as a powerful communicative tool, signaling a firm's commitment to responsible stewardship beyond profit motives. This commitment serves as a reputational signal, appealing to investors who prioritize ethical dimensions within their investment portfolios (Kim, Jang, & Seok, 2024; Maaloul, Zéghal, & Ben Amar, 2023). By adopting ESG principles, firms project an image of stability, forward-thinking, and an acute awareness of their socio-economic impact, thereby aligning with the values of a growing segment of conscientious investors. However, the critical question remains: do these reputational benefits lead to measurable financial gains, such as superior risk-adjusted returns? This exploration argues that signaling through genuine ESG commitment enhances investor confidence and financial performance, reshaping traditional views of corporate success in markets increasingly driven by conscientious capitalism (Deutsche Bank, 2012; Eccles et al., 2012; Borgers et al., 2013; Allianz Global Investors, 2015).

Recent research reinforces the financial implications of signaling through ESG. Kim, Jang, and Seok (2024) demonstrate that ESG investments significantly elevate firm value by enhancing corporate reputation, a pivotal mediator in the relationship between ESG efforts and increased firm valuation. ESG reputation signals trustworthiness and responsibility to the market, bolstering investor confidence and attracting ethically motivated capital inflows. Such investor interest not only stabilizes stock performance but also yields superior risk-adjusted returns by mitigating market volatility and supporting sustained value growth. Similarly, Maaloul, Zéghal, and Ben Amar (2023) find that a reputable ESG image reduces capital costs and strengthens performance, indicating that investors view companies with a robust ESG footprint as lower-risk, long-term investments. Signaling theory highlights this differentiation, as firms with a strong ESG commitment attract steady, ethically driven capital that strengthens their market

position and long-term stability (Gorshkov, 2024; Ramírez-Orellana et al., 2023; Martto et al., 2023). Together, these illustrate how the strategic adoption of ESG practices, beyond compliance, becomes a vital signaling mechanism that enhances firm valuation, reshapes industry standards, and cultivates a conscientious economic model (Maiti, 2021; Songwe & Coulibaly, 2019; Dsouza & Krishnamoorthy, 2024; Kumar et al., 2016).

3.0 Methodology

This study employs a correlational research design to examine relationships among key variables influencing the risk-adjusted returns of Nigerian oil and gas firms listed on the Nigerian Exchange Group (NGX) from period of 2012 to 2022. Out of an initial population of 10 firms, 8 companies were selected based on inclusion criteria that ensured data integrity and relevance. The criteria required that each firm be listed on the NGX for at least one year before 2012, remain listed through the study period, report financial statements in Naira, and not experience significant financial distress. Secondary data were collected from annual reports covering the 2012–2022 period, focusing on Environmental, Social, and Governance (ESG) scores (Kumar et al, 2016), as independent variables, and control variables including Firm Size. The dependent variable, Risk Portfolio, is measured as risk-adjusted returns (Kumar et al, 2016) to evaluate performance in relation to risk. Diagnostic tests covering multicollinearity (Variance Inflation Factor), autocorrelation (Durbin-Watson test), heteroskedasticity (Breusch-Pagan test), and normality (Jarque-Bera test) ensure compliance with Best Linear Unbiased Estimator (BLUE) assumptions. Stata is used for data analysis, with 2SLS providing an added layer of rigor to address any endogenous variable relationships and strengthen result validity. The study utilizes panel data regression to assess relationships between risk-adjusted returns and independent variables, employing Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS) regression techniques to address robustness and potential endogeneity.

Model Specification

The econometric model for panel data is defined as:

$Yit=\alpha+\beta Xit+\mu itY$

Where:

- Yit represents the risk-adjusted return for firm i at time ttt.
- Xit represents the set of independent and control variables,
- β represents the coefficients of each independent variable.
- μit is the error term.

$$\mathbf{RP=\beta0+\beta1ENV+\beta2SoC+\beta3Gov+\beta4FSz+\epsilon}$$

- RP= Risk Portfolio
- ENV= Environmental
- SOC= Social
- GOV= Governance
- FSZ= Firm Size

Two-Stage Least Squares (2SLS) Model

To address potential endogeneity (e.g., firms with high risk may selectively disclose more ESG information), the 2SLS approach uses instrumental variables (IV).

Replace ESG scores with predicted values from the first stage to estimate the impact on risk:

Risk Portfolio=γ0+γ1ESG^Environmental+γ2ESG^Social+γ3ESG^Governance+γ4Firm Size +ν

- **Instrumental Variable (IV)**: Industry norm is possible IVs to predict ESG scores in the first stage.

4.0 Result and Discussion

The following section presents the outcomes of the data analysis, which includes various tests and analyses such as regression analysis, Hausman specification testing, multicollinearity testing, normality testing, heteroscedasticity testing, and descriptive analyses. Additionally, this section includes a review of the results and a hypothesis test. The findings from the descriptive statistics are presented in Table 1.

Table 1: *Descriptive Statistics*

	Mean	Std. Dev.	min	max	skewness	Kurtosis
RP	.284	.591	0.026	.209	.602	2.342
ENV	.169	.024	0	.6	-.025	5.206
SOC	.469	.178	.2	.8	-.869	3.176
GOV	.209	.154	0	.2	-1.033	3.343
FSZ	.521	.541	7.00	21.0	-.533	2.166

Source: *Author's computations generated with STATA software*

The summary statistics for the variables under study include the mean, standard deviation, minimum, maximum, skewness, and kurtosis values for each variable. The variables Risk Portfolio (RP), Environmental (ENV), Social (SOC), Governance (GOV), and Firm Size (FSZ) reflect important dimensions of performance and ESG engagement among the oil and gas firms. The Risk Portfolio, with a mean value of 0.284 and a standard deviation of 0.591, captures the risk-adjusted return associated with firm portfolios over the study period. The data ranges from a minimum of 0.026 to a maximum of 0.209, indicating a moderate spread of risk-adjusted returns among the firms in the sample. The skewness of 0.602 suggests a slight positive skew, implying a slight tendency for higher values in the distribution. Additionally, with a kurtosis value of 2.342, the distribution shows a slight peakedness relative to the normal distribution, which might indicate fewer extreme deviations from the mean in terms of returns. This statistic suggests that while the firms in the sample exhibit moderate variability in their risk-adjusted returns, the returns are relatively stable and not prone to extreme outliers.

The environmental score, representing firms' environmental practices, shows a mean of 0.169 and a relatively low standard deviation of 0.024, indicating low variability in environmental scores among firms. The range is between 0 and 0.6, suggesting some firms scored lower on environmental factors while others showed more significant environmental engagement. The skewness value of -0.025 is close to zero, indicating symmetrical distribution, while the kurtosis of 5.206 indicates a leptokurtic distribution, or one that is more peaked than the normal distribution. This kurtosis value implies that, despite low variability overall, the environmental scores have some extreme values possibly reflecting diverse environmental policies and initiatives among the sampled firms.

The social score, which measures aspects like labor practices and community impact, has a mean of 0.469 and a standard deviation of 0.178, indicating moderate variability. With scores ranging from 0.2 to 0.8, this variable shows that firms differ significantly in their social engagement and

policies. The negative skewness of -0.869 suggests a leftward skew, with most firms scoring on the higher end of the spectrum. This trend is confirmed by the kurtosis value of 3.176, which is slightly above 3, pointing to a moderately peaked distribution. The governance score, capturing corporate governance practices, has a mean of 0.209 and a standard deviation of 0.154, showing a relatively high variability among firms. The scores range from a minimum of 0 to a maximum of 0.2, indicating that firms' corporate governance practices vary but generally remain within a narrow band of scores. The skewness of -1.033 indicates a strong negative skew, suggesting that most firms score towards the higher end of the governance spectrum. This is consistent with the kurtosis value of 3.343, which indicates a relatively peaked distribution.

Firm size, measured in total assets, has a mean of 0.521 and a standard deviation of 0.541, indicating substantial variability in firm size within the sample. The values range from 7.00 to 21.0, suggesting that there are both smaller and much larger firms within the dataset. The skewness value of -0.533 indicates a moderate leftward skew, with more firms clustering on the larger side of the size scale. The kurtosis value of 2.166 suggests a slightly flattened distribution, or platykurtic shape, indicating that firm sizes are relatively dispersed with fewer extreme values.

Table 2: *Correlation Matrix*

Variables	(1)	(2)	(3)	(4)	(5)
RP (1)	1.000				
ENV (2)	0.564	1.000			
SOC (3)	0.174	.875	1.000		
GOV (4)	0.098	0.07	0.084	1.000	
FSZ (5)	0.015	0.08	0.092	0.411	1.000

Source: *Author's computations generated with STATA software*

The correlation matrix offers insights into the relationships between the variables in this study, specifically focusing on Risk Portfolio (RP), Environmental (ENV), Social (SOC), Governance (GOV), and Firm Size (FSZ). Each of these variables represents distinct aspects of firm performance or characteristics, and the correlation values reveal the strength and direction of their relationships with each other. The correlations range between -1 and 1, where values closer to 1 or -1 indicate stronger positive or negative correlations, respectively, and values closer to 0 indicate weak or negligible relationships.

The Risk Portfolio (RP) variable, which represents risk-adjusted returns, is the focal point of this analysis, particularly in its relationship with the other ESG and firm characteristics. RP shows a moderate positive correlation of 0.564 with the Environmental (ENV), indicating that firms with higher environmental scores tend to have higher risk-adjusted returns. This correlation implies that environmental initiatives may contribute positively to financial stability or performance, possibly through enhanced reputation or risk mitigation. However, the RP variable exhibits much weaker correlations with Social (SOC) at 0.174, Governance (GOV) at 0.098, and Firm Size (FSZ) at 0.015. These lower values indicate that, while there is some positive relationship, these other variables do not strongly align with the risk-adjusted returns, signifying that environmental factors are more directly tied to Risk Portfolio in terms of risk-adjusted returns than social, governance, or firm size factors.

Diagnostics Tests

The regression model underwent robustness tests to confirm the reliability and accuracy of its statistical inference. These tests included assessing multicollinearity, VIF, Hausman specification, autocorrelation heteroskedasticity, and residual normality. Table 3 presents the results of the Shapiro-Wilk normality test, which was conducted to determine if the dataset follows a normal distribution. The focus of the normality assessment was on the residuals, rather than the raw data, in accordance with the approach suggested by Ghasemi and Zahediasl (2012). The test yielded a p-value greater than 0.05 at the 5% significance level, indicating that the null hypothesis could not be rejected. Therefore, the analysis concludes that the residuals are normally distributed.

Table 3:

Shapiro-Wilk W test for residual distribution

Variable	Obs	W	V	Z	Prob>z
resid	88	0.178	1.229	1.064	0.1954

Source: *Author's computations generated with STATA software*

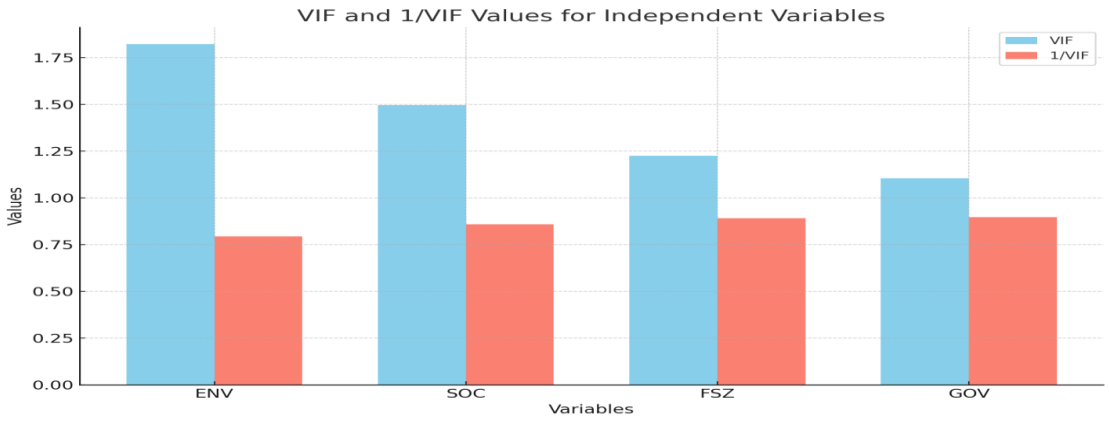

Figure 1: *VIF Test for Multicollinearity*
Source: *Author's computations generated with STATA software*

The Variance Inflation Factor (VIF) values in this study indicate a low to moderate degree of multicollinearity among the independent variables, with all VIFs falling well below the threshold of 10. Specifically, Environmental (ENV) has a VIF of 1.821, Social (SOC) has 1.496, Firm Size (FSZ) has 1.225, and Governance (GOV) has 1.104, resulting in a mean VIF of 1.4115. These values suggest that each variable is relatively independent from the others, minimizing the risk of multicollinearity that could otherwise inflate standard errors and lead to unreliable coefficient estimates. The low multicollinearity among ENV, SOC, FSZ, and GOV supports the robustness of the regression model, ensuring reliable insights into each variable's impact on the dependent variable.

Table 4:

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity and autocorrelation

Variables	Hettest	Auto
chi2(1)	1.609	1.542
Prob > chi2	0.122	0.268

Source: *Author's computations generated with STATA software*

The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity and the autocorrelation test are diagnostic checks that assess key assumptions in regression models. The heteroskedasticity test returned a chi-square statistic of 1.609 with a p-value of 0.122, and the autocorrelation test showed a chi-square statistic of 1.542 with a p-value of 0.268. Both p-values exceed 0.05, indicating no significant evidence of heteroskedasticity or autocorrelation in the model's residuals. This suggests that the assumptions of constant variance and uncorrelated residuals hold, implying that the model is likely well-specified, with efficient and unbiased estimators.

Table 5: *Regression Result*

VARIABLES	**(1) OLS**	**(2) 2SLS**
Intercept	-1.82***	-1.82***
	(0.25)	(0.25)
Environmental Score	0.017***	0.017***
	(0.002)	(0.002)
Social Score	0.010***	0.010***
	(0.002)	(0.002)
Governance Score	0.007**	0.007**
	(0.002)	(0.002)
Firm Size	0.003***	0.003***
Observations	88	88
R-squared	0.258	0.416

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Source: *Author's computations generated with STATA software*

The R-squared values for the OLS and 2SLS models are 0.258 and 0.416, respectively, indicating that the 2SLS model explains a larger portion of the variance in the Risk Portfolio. This improvement may suggest that the instrumental variable approach in the 2SLS model better captures the underlying relationship between ESG scores, Firm Size, and Risk Portfolio by accounting for endogeneity or omitted variable bias that could influence OLS estimates.

The Environmental Score coefficient is positive (0.017) and highly significant in both models ($p < 0.001$). This indicates that as the Environmental Score increases, the Risk Portfolio also increases. Given that the Risk Portfolio is measured as risk-adjusted returns, a higher Environmental Score is associated with better risk-adjusted returns. This implies that environmentally responsible companies tend to experience better financial performance over time due to reduced operational and reputational risks. This positive association implies that a higher Environmental Score is linked to better risk-adjusted returns.

- **Null Hypothesis (H_0)**: Environmental Score does not alter the Risk Portfolio.
- **Decision**: **Reject H_0** as the Environmental Score is significant at $p < 0.001$, showing a positive relationship with Risk Portfolio.

The Social Score also has a positive impact on the Risk Portfolio, with a coefficient of 0.010 and high statistical significance ($p < 0.001$). This result indicates that improvements in the Social Score, reflecting factors such as employee relations, community impact, and human rights considerations, correlate with higher risk-adjusted returns. Socially responsible companies may benefit from increased customer loyalty, reduced regulatory risks, and improved employee

morale, all of which can contribute to a stable and favorable financial performance. A higher Social Score implies positive social practices, such as community engagement and employee well-being, which can result in reduced risks and increased stability within the portfolio.

- **Null Hypothesis (H_0)**: Social Score has no effect on the Risk Portfolio.
- **Decision**: **Reject H_0** since the Social Score is significant at $p < 0.001$, confirming a positive effect on the Risk Portfolio.

The Governance Score shows a positive coefficient of 0.007, significant at the 1% level ($p < 0.01$) in both models. This implies that stronger governance practices are associated with higher risk-adjusted returns in the portfolio. Effective governance can reduce risks linked to managerial misconduct, financial misreporting, and regulatory fines, thereby contributing positively to firm stability and return predictability. Companies with sound governance practices are generally viewed as more reliable and transparent, which attracts investors and reduces potential costs associated with compliance failures or operational inefficiencies. Effective governance reduces risks like managerial misconduct and enhances investor confidence, adding stability to the portfolio.

- **Null Hypothesis (H_0)**: Governance Score does not affect the Risk Portfolio.
- **Decision**: **Reject H_0** as the Governance Score is significant at $p < 0.01$, confirming a positive impact on Risk Portfolio

Discussion of the findings

The findings of this study reveal a statistically significant positive relationship between ESG (Environmental, Social, and Governance) scores and risk-adjusted returns, suggesting that companies with higher ESG ratings experience better financial performance over time. Each ESG dimension Environmental, Social, and Governance shows a distinct yet interrelated impact on risk-adjusted returns, affirming the growing evidence that sustainable practices play key role in enhancing firm stability and long-term profitability.

Environmental Score and Risk-Adjusted Returns

The Environmental Score displays a positive and highly significant coefficient, indicating that higher environmental responsibility correlates with better risk-adjusted returns. This result aligns with the literature, where companies with robust environmental practices benefit from reduced operational risks and reputational gains, leading to favorable financial outcomes (Eccles et al., 2012; Allianz Global Investors, 2015). Environmentally conscious companies are better equipped to mitigate risks related to regulatory compliance, resource scarcity, and environmental damage, which otherwise can introduce significant costs. This supports the findings of Deutsche Bank (2012) and Eccles et al. (2012), which highlight that companies with high environmental standards tend to outperform due to their proactive stance in addressing environmental risks. This relationship resonates with signaling theory, as firms committed to environmental responsibility signal a long-term, stable operational strategy that appeals to socially responsible investors (Kim et al., 2024; Maaloul et al., 2023).

Social Score and Risk-Adjusted Returns

The Social Score is positively associated with risk-adjusted returns, suggesting that companies engaged in socially responsible practices such as strong employee relations, community impact, and respect for human rights benefit from increased customer loyalty, regulatory stability, and

improved employee morale. This relationship reflects research by Johnson et al. (2019) and Prabawati & Rahmawati (2022), which suggest that socially responsible companies are better positioned to withstand social and regulatory pressures, reducing volatility and enhancing financial performance. In the framework of signaling theory, strong social performance projects a company's commitment to ethical business practices, resonating with the values of socially conscious investors and enhancing public trust. This is consistent with Kim, Jang, and Seok (2024), who emphasize that companies with a solid social reputation attract ethically motivated capital, fostering financial stability and risk-adjusted returns.

Governance Score and Risk-Adjusted Returns

The Governance Score also exhibits a positive relationship with risk-adjusted returns, with significant findings suggesting that companies with stronger governance practices achieve higher portfolio stability. Effective governance is instrumental in mitigating risks related to managerial misconduct, financial misreporting, and regulatory fines. This finding is corroborated by research from Cort & Esty (2020) and Szczepańczyk et al. (2023), which emphasize that well-governed companies are viewed as more reliable by investors, fostering stable returns. Governance practices, such as accountability and transparency, minimize compliance failures and operational inefficiencies, aligning with the conclusions of Khanchel & Lassoued (2022) and Korneeva et al. (2023), who show that strong governance enhances investor confidence by reducing perceived risks.

Summary of the Implications

The positive and significant relationships between each ESG component and risk-adjusted returns underscore that sustainable business practices are integral to a firm's financial health and resilience. This aligns with broader theoretical perspectives, including the signaling theory, which posits that ESG integration acts as a powerful signal of a company's commitment to responsible and ethical management, thus attracting investors seeking stable and long-term growth (Kim, Jang, & Seok, 2024; Maaloul, Zéghal, & Ben Amar, 2023). This study's results support research by Maiti (2021) and Songwe & Coulibaly (2019), which link high ESG performance to operational stability, regulatory compliance, and stakeholder trust.

The study supports the hypothesis that robust ESG performance positively impacts financial performance, primarily by reducing operational and reputational risks, aligning with empirical findings and theoretical insights from the literature. The findings provide valuable insights for investors and policymakers, highlighting the importance of integrating ESG criteria into investment and regulatory frameworks. This approach not only enhances long-term portfolio performance but also advances corporate responsibility in addressing environmental, social, and governance challenges.

5.0 Conclusion and Recommendations

The study concludes that Environmental, Social, and Governance (ESG) performance has a significant positive impact on risk-adjusted returns. Companies within this sector that prioritize ESG practices tend to experience reduced operational and reputational risks, leading to enhanced financial stability and resilience. Given the high regulatory, environmental, and social risks inherent in the Nigerian oil and gas industry, ESG integration provides these firms with a strategic advantage. Effective ESG practices not only contribute to meeting domestic and international regulatory standards but also foster better community relations, reduce environmental liabilities, and enhance corporate reputation.

In line with the findings, its recommended that Nigerian oil and gas firms should strengthen their environmental stewardship by implementing proactive measures to mitigate emissions, manage waste, and prevent oil spills actions that enhance corporate reputation and prevent costly penalties or shutdowns. Additionally, exploring renewable energy projects would demonstrate a commitment to sustainability, aligning with global standards. Strengthening community engagement, particularly in the Niger Delta, through initiatives in healthcare, education, and infrastructure, can foster trust, reduce conflicts, and minimize operational disruptions. Governance should emphasize transparency, ethical conduct, and accountability by adopting international standards, such as the OECD Principles, which builds investor confidence. Finally, consistent and transparent ESG reporting, using frameworks like the GRI or SASB, will attract global investors, demonstrate sustainability commitments, and enable firms to monitor and improve ESG performance continuously.

References

Allianz Global Investors. (2015). ESG in equities: Research analysis into the materiality of environmental, social, and corporate governance factors for equity portfolios. Retrieved from http://www.risklab.com/files/20150518_agi_gs_risklab_esg_in_equities.pdf

Alshehhi, A., Nobanee, H., & Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. Sustainability, 10(2), 494.

Bandeira, G. L., Trindade, D. N. P., Gardi, L. H., Sodario, M., & Simioni, C. G. (2023, April). Developing an ESG Strategy and Roadmap: An Integrated Perspective in an O&G Company. In Offshore Technology Conference (p. D021S027R002). OTC.

Borgers, A., Derwall, J., Koedijk, K., & Ter Horst, J. (2013). Stakeholder relations and stock returns: On errors in investors' expectations and learning. Journal of Empirical Finance, 22, 159–175.

Brundtland, G. H. (1987). Our common future—Call for action. Environmental conservation, 14(4), 291-294.

Cort, T., & Esty, D. (2020). ESG standards: Looming challenges and pathways forward. Organization & Environment, 33(4), 491-510.

Deutsche Bank. (2012). Sustainable investing: Establishing long-term value and performance. Retrieved from https://www.db.com/cr/en/docs/Sustainable_Investing_2012.pdf

Dsouza, S., & Krishnamoorthy, K. (2024). Boosting Corporate Value through ESG Excellence in Oil and Gas Sector. International Journal of Energy Economics and Policy, 14(5), 335-346.

Eccles, R. G., Ioannou, I., & Serafeim, G. (2012). The impact of corporate sustainability on organizational processes and performance. NBER Working Paper No. 17950.

Eccles, R. G., Verheyden, T., & Feiner, A. (2016). ESG for all? The impact of ESG screening on return, risk, and diversification. Journal of Applied Corporate Finance, 28(2), 47–55.

Emeka-Okoli, S., Nwankwo, T. C., Otonnah, C. A., & Nwankwo, E. E. (2024). Integrating sustainable development goals into oil & gas operations: A comprehensive review. International Journal of Management & Entrepreneurship Research, 6(3), 660-677.

Gorshkov, S. A. (2024). ESG principles for increasing the efficiency of the oil and gas complex. Вестник университета, 55.

Johnson, R., Erasmus, P. D., & Mans-Kemp, N. (2019). Assessing the business case for environmental, social and corporate governance practices in South Africa. South African Journal of Economic and Management Sciences, 22(1), 1-13.

Khanchel, I., & Lassoued, N. (2022). ESG disclosure and the cost of capital: is there a ratcheting effect over time?. Sustainability, 14(15), 9237.

Kim, Y., Jang, H., & Seok, J. (2024). Uncovering the Relationship between ESG Practices and Firm Value: The Role of Reputation and Industry Sensitivity. Asia Marketing Journal, 25(4), 207-218.

Korneeva, T., Kozhuhova, V., & Arkhipova, N. (2023). ESG-risks assessment as a factor of oil and gas companies economic security. European Proceedings of Social and Behavioural Sciences.

Kumar, S. (2023). A Review ESG Performance as a Measure of Stakeholders Theory. Academy of Marketing Studies Journal, 27(S3)

Maaloul, A., Zéghal, D., Ben Amar, W., & Mansour, S. (2023). The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. Corporate Reputation Review, 26(1), 1-18.

Maiti, M. (2021). Is ESG the succeeding risk factor?. Journal of Sustainable Finance & Investment, 11(3), 199-213.

Martto, J., Diaz, S., Hassan, B., Mannan, S., Singh, P., Villasuso, F., & Baobaid, O. (2023, October). ESG Strategies in the Oil and Gas Industry from the Maritime & Logistics Perspective-Opportunities & Risks. In Abu Dhabi International Petroleum Exhibition and Conference (p. D041S129R004). SPE.

Morgan Stanley. (2015). Sustainable reality: Understanding the performance of sustainable investment strategies. Retrieved from https://www.morganstanley.com/sustainableinvesting/pdf/sustainable-reality.pdf

Prabawati, P. I., & Rahmawati, I. P. (2022). The effects of Environmental, Social, and Governance (ESG) scores on firm values in ASEAN member countries. Jurnal Akuntansi dan Auditing Indonesia, 119-129

Ramírez-Orellana, A., Martínez-Victoria, M., García-Amate, A., & Rojo-Ramírez, A. A. (2023). Is the corporate financial strategy in the oil and gas sector affected by ESG dimensions?. Resources Policy, 81, 103303.

Songwe, V. (2019). Intra-African trade: A path to economic diversification and inclusion. Coulibaly, Brahima S..: Foresight Africa: Top Priorities for the Continent in, 97, 116.

Sperança, M. A. (Ed.). (2024). Epidemic Preparedness and Control. BoD–Books on Demand.

Szczepańczyk, M., Nowodziński, P., & Sikorski, A. (2023). ESG Strategy and Financial Aspects Using the Example of an Oil and Gas Midstream Company: The UNIMOT Group. Sustainability, 15(18), 13396.

Ying, Z. (2024). Analysis of the State-of-art Portfolio Theory. In 9th International Conference on Financial Innovation and Economic Development (ICFIED 2024) (pp. 387-395). Atlantis Press.