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Article

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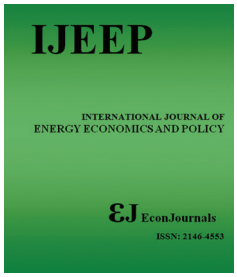

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Boosting Corporate Value through ESG Excellence in Oil and Gas Sector

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ABSTRACT

The research investigates the impact of environmental, social, and governance (ESG) excellence on the corporate valuation in the oil and gas sector, addressing the problem of quantifying ESG's influence on market worth. The study utilized a comprehensive dataset from the Thomson Reuters database, covering 960 global firms over the period 2011-2022. Through empirical analysis, the study revealed that while ESG excellence directly correlates negatively with corporate valuation, its indirect benefits through enhanced profitability and operational efficiency are significant. Specifically, ESG excellence improves operational efficiency, which in turn positively impacts market value. The study found no direct significant impact of ESG excellence on profitability, but enhanced operational efficiency mediated by ESG leads to increased corporate valuation. These findings highlight the importance of converting ESG efforts into tangible financial benefits, emphasizing profitability and operational efficiency as key mediators. The study concludes that ESG practices, when effectively integrated into business strategies, significantly enhance a firm's market value and operational efficiency. This research provides actionable insights for policymakers, corporate strategists, and investors, promoting the adoption of robust ESG practices to achieve sustainable growth and long-term financial success in the oil and gas sector. Future research should focus on industry-specific analyses, longitudinal studies, and the development of sophisticated ESG metrics to further elucidate these relationships.

Keywords: Environmental, Social, and Governance Excellence, Corporate Valuation, Oil and Gas Sector, Profitability, Operational Efficiency
JEL Classifications: G3; G320; M210

1. INTRODUCTION

In recent years, the integration of environmental, social, and governance (ESG) factors into corporate strategy has gained significant momentum, particularly within industries with substantial environmental impacts such as the oil and gas sector. This research focuses on exploring the relationship between ESG excellence and corporate value in the oil and gas industry, aiming to understand how superior ESG excellence can enhance market worth and attract investment. By investigating the multifaceted impacts of ESG practices, this study seeks to reveal the tangible benefits of sustainability initiatives, providing a clearer picture of how ESG considerations can be leveraged to boost corporate financial performance and stakeholder value. As the world increasingly prioritizes sustainable development, it becomes imperative for oil and gas companies to align their strategies with ESG principles to remain competitive and relevant (Jin & Lei, 2023; Xu et al., 2022).

The oil and gas sector, historically criticized for its environmental footprint, is at a pivotal juncture where adopting sustainable practices is not only beneficial but essential for long-term success. The intersection of sustainability and financial performance presents a compelling narrative that showcases the evolving dynamics within this crucial industry. Companies in the oil and gas sector face mounting pressure from governments, investors, and the public to reduce their environmental impact, enhance social responsibility, and ensure robust governance practices (Agbaji

et al., 2023). This transformation is not merely a compliance exercise but a strategic necessity that can lead to significant competitive advantages. For instance, firms that excel in ESG practices are better positioned to mitigate regulatory risks, attract investment from ESG-conscious investors, and gain favour with environmentally and socially conscious consumers (Baratta et al., 2023). Additionally, the proactive adoption of ESG measures can lead to operational efficiencies, cost savings, and innovations that further strengthen a company's market position (Aldowaish et al., 2022). As the industry navigates these changes, understanding the relationship between ESG excellence and corporate value is crucial for stakeholders aiming to foster sustainable and profitable growth.

Extant literature suggests a positive correlation between ESG excellence and corporate value. Studies indicate that high-quality ESG excellence can increase enterprise value significantly, attracting media attention, analyst coverage, and investment (Jin & Lei, 2023; Xu, 2023). Furthermore, integrating ESG principles helps companies mitigate risks, enhance competitiveness, and achieve value co-creation for stakeholders (Cohen, 2023; Zheng et al., 2022). In the oil and gas sector, firms are increasingly adopting ESG practices to align with global sustainability goals and meet regulatory requirements (Aldowaish et al., 2022; Shah et al., 2022).

This study builds on existing studies by focusing specifically on oil and gas sector, examining how ESG excellence translates into corporate valuation. Unlike previous research that often generalizes across industries, this study delves into the unique challenges and opportunities within oil and gas, providing a granular analysis of ESG's impact on market worth and financial performance.

The specific research problem addressed in this study is the need to quantify and validate the impact of ESG excellence on corporate valuation within the oil and gas sector. The problem statement can be articulated as follows: "To what extent does ESG excellence influence corporate valuation in the oil and gas industry, and through what mechanisms do financial performance metrics mediate this relationship?"

The novelty of this research lies in its sector-specific analysis, concentrating on the oil and gas industry's unique ESG challenges and opportunities. By utilizing comprehensive data from the Thomson Reuters database, this study offers robust empirical evidence on how ESG practices influence corporate valuation. The contributions include a detailed examination of the mediating effects of profitability and operational efficiency, providing actionable insights for industry stakeholders aiming to enhance corporate value through sustainable practices.

The rest of the paper is designed as follows: The second part, literature review and the formation of research hypotheses, surveys existing research on ESG and corporate valuation, particularly in the oil and gas sector, proposes hypotheses and the research gap. The third part, study design, describes the sample selection, data sources, variable design, and model development used to analyze the relationship between ESG excellence and corporate value. The fourth part, result analysis, presents descriptive statistics, correlation analysis, and regression results, examining the impact of ESG excellence on corporate valuation and the mediating role of financial metrics. The fifth part, conclusion, summarizes the key findings, discusses implications for practice, and suggests areas for future study. This comprehensive methodology ensures a thorough understanding of how ESG excellence can drive corporate valuation in the oil and gas sector, providing valuable insights for both academics and industry practitioners.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

This section surveys existing research on the interplay between ESG excellence and corporate valuation, particularly in the oil and gas industry. It will build the theoretical foundation and propose research hypotheses.

2.1. ESG Excellence and Corporate Valuation

ESG excellence plays a crucial role in determining corporate valuation. Research indicates a significant positive correlation between ESG excellence and corporate value. Studies show that for every 1% increase in ESG excellence, enterprise value can increase by 7.2% on average (Xu, 2023). High-quality ESG excellence not only enhances corporate value but also attracts media attention and analyst coverage, promoting stakeholder pressure and further increasing corporate value (Jin & Lei, 2023). Additionally, ESG concepts can help companies attract investment, enhance competitiveness, and achieve value co-creation for multiple stakeholders, reshaping innovation processes and bringing competitive value to corporate value (Cohen, 2023; Zheng et al., 2022). These findings underscore the importance of ESG considerations in driving corporate valuation and overall business success (Jin & Lei, 2023).

Current trends and practices in integrating ESG factors in the oil and gas industry are evolving rapidly. Studies highlight that firms are increasingly adopting ESG practices to mitigate risks and enhance overall performance (Aldowaish et al., 2022; Lisovsky, 2022). Factors such as new technologies, international market presence, and regulatory requirements drive environmental practices, while social practices are influenced by operational efficiency improvements and investment attractiveness (Shah et al., 2022). Research indicates that public sentiment towards ESG-related issues is generally neutral or positive, showcasing growing interest and acceptance of ESG principles (Park et al., 2022). Furthermore, the exponential increase in publications on ESG underscores the global shift towards considering ESG factors, including green investing and sustainability initiatives in the oil and gas sector (Senadheera et al., 2022).

Enhancing market worth in the oil and gas industry through ESG effectiveness is crucial for attracting investors and improving financial performance. Studies highlight the positive effect of ESG factors on financial sustainability, with a focus on incorporating ESG principles to drive growth and market value (Whitaker, 2022; Aizada et al., 2023). The industry's positive ESG narrative stems from factors like the role of gas in the energy transition,

safety performance, and social responsibility initiatives, which contribute to overall market attractiveness (Menéndez et al., 2022). Implementing ESG strategies not only aligns with global sustainability goals like the UN's sustainable development goals but also enhances business relationships and fosters innovation ecosystems, ultimately boosting market competitiveness and worth (Nazarova and Kolkina, 2016). By emphasizing ESG criteria in operational and strategic management, oil and gas companies can improve their performance, attract investors committed to sustainable practices, and ultimately enhance their market value (Varvara and Victoria, 2022).

Incorporating ESG factors in the oil and gas industry is becoming increasingly crucial due to the industry's significant contribution to global emissions. ESG integration is essential for sustainability and net-zero emissions goals. The industry is adapting ESG practices to address climate change challenges (Agbaji et al., 2023). ESG practices are increasingly integrated into oil and gas industry operations, focusing on sustainability, risk management, and stakeholder value creation. Companies are now under pressure from investors and governments to disclose detailed plans for achieving net-zero emissions by 2050 (Baratta et al., 2023). The industry recognizes the importance of sustainability and ESG practices, with a shift towards integrating these factors into business operations and engineering design (Setiarini et al., 2023). The adoption of ESG practices is not only a compliance exercise but a strategic decision essential for long-term success and alignment with global climate goals (Thieu, 2023). Furthermore, the ESG paradigm is gaining momentum globally, focusing on reducing carbon emissions and generating value for stakeholders (Sookram, 2016). Standardizing ESG-centric strategies and addressing challenges like "greenwashing" are key areas of focus for the industry.

2.1.1. Environmental stewardship and corporate value

Environmental stewardship significantly enhances corporate value by positively influencing shareholder value, company effectiveness, innovation, and investment efficiency. Research shows that environmental sustainability performance (ESP) is linked to increased shareholder value, particularly in European firms with low investor protection and widespread family ownership (Jouber, 2023). Additionally, corporate environmental responsibility (CER) improves company effectiveness, with strategic similarity mediating this relationship and organizational slack moderating it (Nasereddin, 2023). Corporate ESG practices also boost corporate value and innovation levels, with corporate innovation acting as a mediator and the institutional environment as a moderator (Jin & Lei, 2023; Alsayegh et al., 2022). Furthermore, corporate sustainability performance (CSP) enhances investment efficiency, especially through the social dimension, thereby improving firm value (Liu et al., 2022). These outcomes highlight the significance of environmental stewardship in driving corporate value through various mechanisms.

Companies can enhance environmental stewardship by developing effective environmental strategies. This involves identifying areas for improvement, establishing value exchanges with stakeholders, ensuring credibility in environmental efforts, and aligning with competitive strategies (Potoski, 2023). Embracing sustainable development goals (SDGs) helps businesses create positive impacts on health, welfare, and ecosystems (Ramadhan et al., 2022). Additionally, corporate governance plays a critical role in driving greener company performance by incentivizing and monitoring managers' actions related to environmental strategies, leading to multidimensional environmental improvements that positively affect financial and nonfinancial performance (Umar and Wei, 2022). Integrating these strategies allows companies to meet stakeholder expectations, improve their financial position, and contribute to environmental sustainability.

2.1.2. Social responsibility and corporate value

Corporate social responsibility significantly enhances corporate value. Research indicates a positive dynamic relationship between social capital, social responsibility, and corporate value (Mengke et al., 2023). CSR practices, such as corporate giving, employee welfare packages, and creditor relationships, significantly impact return on assets, demonstrating a strong link among CSR and corporate performance (Inyang et al., 2023). The presence of independent commissioners and CSR initiatives positively influence the value of state-owned and manufacturing companies (Muslim and Sonjaya, 2023). Additionally, factors like tax burden, equity concentration, and institutional investor shareholding moderate the relationship between CSR and corporate value (Jia & Tian, 2022). These findings underscore the importance of CSR in driving corporate value and performance.

Enhancing corporate reputation through social responsibility involves prioritizing ethical responsibilities, legal compliance, economic contributions, and philanthropic initiatives (Kostenkova, 2023; Venegas-Villanueva et al., 2023). Fulfilling ethical CSR expectations positively influences reputation for product quality and social responsibility, while legal CSR enhances reputation for both (Ijabadeniyi and Govender, 2024). Engaging in economic CSR impacts product quality reputation, highlighting the need for a balanced approach (Rolf, 2023). Aligning CSR initiatives with overall company strategy maximizes their influence on brand reputation, emphasizing the integration of CSR into the company's overarching plan. By strategically implementing CSR activities across ethical, legal, economic, and philanthropic dimensions, companies can enhance their reputation and gain a competitive market advantage.

2.1.3. Governance practices and corporate value

Governance practices are pivotal in determining corporate value across industries. Research shows that strong corporate governance positively influences financial performance, investor attraction, and market performance, ultimately enhancing corporate value (Buren et al., 2023; Belyaeva and Kharchilava, 2020; Jo and Harjoto, 2011). Value-oriented corporate governance, where values are integrated into the business culture, is related to higher levels of governance, market capitalization, and sustainable development (Suddaby et al., 2022). In performing arts organizations, governance practices signal economic accountability through legitimacy and artistic excellence through authenticity, highlighting the need to balance these demands for success (Muslim, 2023). Overall, robust governance practices foster financial performance and contribute significantly to a company's long-term value and sustainability.

Effective governance practices also enhance shareholder trust. Studies emphasize the importance of corporate governance in increasing investor and stakeholder trust, particularly in emerging markets, by focusing on shareholders' rights, transparency, and stakeholder protection (Saygili et al., 2021). Effective governance mechanisms ensure accountability, transparency, and fairness, leading to improved investor confidence and organizational performance (Rajendran and Vethirajan, 2022). A well-structured governance framework balances power-sharing among shareholders, directors, and management, enhancing shareholder value and protecting stakeholders' interests (Alnaser et al., 2014). Implementing efficient internal control procedures, cooperative attitudes, and legal limitations further protects investors and increases trust in the organization (Hossain et al., 2018; Mehta and Chandani, 2020).

Hypothesis H_1: The impact of ESG excellence on corporate valuation is mediated by profitability and operational efficiency in the oil and gas sector.

2.2. Financial Metrics in Relation to ESG Excellence

2.2.1. Environmental performance and financial metrics

Financial metrics play a crucial role in assessing the relationship between ESG factors and financial performance. The study highlight the importance of distinguishing between ESG factors and quality factors when integrating ESG data into investment processes (El-Haj et al., 2020). While ESG aspects are increasingly emphasized in decision-making processes, challenges exist in quantifying and comparing ESG reports due to the lack of metric measurement systems (Chen and Deleon, 2020). Research also indicates that companies aligned with climate change laws tend to outperform benchmarks, with the social factor showing the strongest correlation to ESG combined scores (Hajdu et al., 2023). Furthermore, the proposal of ESG value creation metrics aims to clarify the impact of a company's ESG strategy on financial statements, providing investors with valuable insights into the value created by ESG initiatives (Díaz-Peña et al., 2022).

ESG excellence can indeed lead to financial outperformance as evidenced by various research studies. Studies have shown that corporate social responsibility (CSR) has a significant positive effect on financial performance (Whelan et al., 2021), while ESG excellence and its sub-dimensions have a positive impact on accounting-based financial performance such as return on assets (ROA) (Ihsani et al., 2023). Additionally, companies investing more in research and development (R and D) tend to have higher ESG excellence, which in turn correlates with superior economic and financial performance (Xu et al., 2022). However, it is essential to footnote that the long-term financial impact of CSR initiatives may not always be significant, potentially due to symbolic rather than substantial changes resulting from CSR proposals (Agbaji, et al., 2023; Zheng et al., 2022). Therefore, while ESG excellence can enhance financial performance, companies should also consider other factors and long term implications when evaluating the relationship between ESG practices and superior financial performance.

2.2.2. Social responsibility and financial metrics

Corporate social responsibility (CSR) significantly influences financial metrics and performance across industries. Research shows a positive relationship between CSR and financial performance, with socially responsible practices leading to increased financial success (Ambarwati et al., 2022). In the banking sector, CSR activities enhance the value relevance of financial data, especially in communication transparency and market responsiveness (Bolibok, 2021). In Latin American microfinance institutions (MFIs), improved financial performance enables greater investment in socially responsible activities, indicating a causal relationship from financial performance to CSR (Tremblay et al., 2022). Additionally, CSR disclosure reduces financial constraints, particularly in opaque firms, emphasizing the resilience of CSR-disclosing firms to financial shocks (Liu et al., 2019). Social responsibility accounting positively impacts the financial performance of public shareholding companies, as evidenced amid the COVID-19 pandemic on the Amman stock exchange (Shahwan et al., 2023).

The impact of CSR on stock value can vary. Some studies suggest CSR efforts may not directly affect company value (Yani and Halim, 2023), while others highlight a positive connection between CSR activities and stock market performance, especially when aligned with the company's core business (Fathima Rizwan and Jenita, 2022). Socially responsible investing has gained importance, with investors considering both monetary returns and societal impact, potentially influencing stock prices based on CSR performance (Rijaluddin and Purwanto, 2022). Social activism events, such as athlete protests, have been shown to influence investor focus and emotions, leading to spillover effects on sponsoring companies' stock prices and trading volumes (Mehta and Chandani, 2020; Sampath et al., 2023). Overall, while the direct impact of CSR on stock value may vary, strategic CSR initiatives and investor perceptions of social responsibility can influence stock market excellence.

2.2.3. Governance practices and financial metrics

Effective governance practices significantly influence financial metrics and organizational performance. Studies show a positive relationship between corporate governance practices and financial results, with transparency and disclosure positively impacting financial performance. However, traditional financial metrics like return on investment, return on assets, and return on equity provide a limited view of corporate performance, highlighting the need for a broader assessment framework, such as the triple-bottom line (TBL) approach, which includes social and environmental dimensions (Bui and Krajcsák, 2023). Research on firms listed on the Bucharest stock exchange reveals a significant positive relationship between corporate governance practices and Tobinq rate, emphasizing governance principles in financial success (Namirembe et al., 2022; Onwuka, 2021; Pintea et al., 2020).

Companies can enhance financial metrics by improving governance through various means. Good corporate governance practices, such as transparency, disclosure, and effective implementation of governance mechanisms, positively impact financial performance (Affes and Jarboui, 2023; Chalabi and

Jarraya, 2001; Onwuka, 2021). Implementing effective corporate governance improves financial performance, as evidenced by studies examining how governance practices impact financial performance (Bui and Krajcsák, 2023; Glassman et al., 2017). Additionally, leveraging ESG strategies can enhance financial results by creating value through ESG initiatives, thus providing better information to decision-makers on the value created by such strategies. Incorporating TBL approaches ensures a more comprehensive assessment of performance beyond traditional financial metrics, leading to a holistic view of the impact on society and the environment.

Hypotheses:
H_{2a}: Superior ESG excellence leads to higher profitability.
H_{2b}: ESG excellence impacts corporate value via operational efficiency.

2.3. Financial Metrics and Corporate Valuation

Financial metrics are crucial for corporate valuation, offering an understanding of a company's operational effectiveness and financial condition. Natural capital accounting helps calibrate environmental impacts on financial metrics, promoting transparency and informed decision-making (Mohr and Thissen, 2022). Methodologies like logistic regression and corporate metrics assess and forecast financial risks, ensuring cash flow stability and achieving financial targets (Palepu et al., 2020). Corporate managers use financial analysis to evaluate enterprises, focusing on key indicators to assess financial risks and creditworthiness (Hristozov, 2021). Techniques such as vertical and horizontal analysis, along with financial ratios, value companies by measuring liquidity, indebtedness, and profitability levels. Understanding essential metrics like enterprise value is crucial for profitability ratios and overall corporate valuation (Coulon and Coulon, 2020).

Common financial metrics for evaluating performance and value encompasses metrics such as net income, return on assets, return on equity, cash flow, liquidity ratios (current ratio and quick ratio), and profitability ratios (return on investment).and composite indicators providing a comprehensive assessment of business operations (Imaama et al., 2022; Rastić et al., 2021; Noy, 2023). These metrics help stakeholders understand financial health, operational efficiency, and growth potential. Analysing financial statements is essential for evaluating a company's financial position, future prospects, and economic power concentration, highlighting areas needing improvement like return on equity ratios (Uddin et al., 2022). Using these metrics and analyses, investors and management can make informed decisions regarding investments, strategic planning, and overall performance evaluation.

Hypotheses:
H_{3a}: ESG excellence influences corporate value through profitability.
H_{3b}: Superior ESG excellence enhances operational efficiency.

2.4. Research Gap

Despite the growing body of literature emphasizing the positive link between ESG excellence and corporate value, particularly in the oil and gas sector, there remains a significant research gap in understanding the specific mechanisms through which ESG excellence influences financial outcomes in this industry. Existing studies often generalize across various sectors, neglecting the unique challenges and opportunities unique to the oil and gas industry. Additionally, while the impact of individual ESG factors on corporate valuation has been explored, there is limited research on how the integration of comprehensive ESG strategies can drive long-term financial performance and market worth. This study aims to fill this gap by providing a sector-specific analysis of ESG practices in the oil and gas industry, examining how these practices can enhance corporate value and identifying the mediating roles of profitability and operational efficiency. By focusing on a detailed empirical analysis of ESG outcomes, this research seeks to offer actionable insights that are tailored to the distinctive context of the oil and gas sector.

3. STUDY DESIGN

This study investigates the relationship between ESG excellence, financial results, and market value using data from global oil and gas firms listed in the Thomson Reuters database, covering the period from 2011 to 2022. The analysis involves constructing empirical models to investigate these relationships and determine if financial results mediate the impact of ESG outcomes on market worth. Comprehensive data handling and regression analyses using STATA ensure robust and reliable findings, contributing to the understanding of ESG's impact on the market value in the global oil and gas sector.

3.1. Sample Selection and Data Sources

The data were collected from oil and gas sector firms globally, covering a broad dataset that spans from 2011 to 2022, providing a comprehensive analysis over an 11-year period.

3.1.1. Data sources

For this study on "Boosting Corporate Value through ESG Excellence in the Oil and Gas Sector," the primary data source is the Thomson Reuters database. Thomson Reuters is renowned for its extensive and reliable financial information, making it a trusted resource for detailed ESG excellence rating data, financial data and economic data. The database offers extensive information on ESG metrics, which are crucial for analyzing the impact of ESG practices on corporate value in the oil and gas sector. Thomson Reuters is selected due to its credibility and the exhaustive nature of its ESG excellence ratings. These ratings are widely recognized and respected in both academic and professional circles, providing a robust foundation for our study. By leveraging detailed financial and ESG data from Thomson Reuters, we aim to conduct a thorough analysis that will offer the valuable insights into how ESG excellence can enhance corporate value in the oil and gas industry.

3.1.2. Sample selection

For this research, the sample includes 960 firms from the global oil and gas sector, with 7036, firm-year. These firms are selected based on the readiness of consistent ESG combined score data from the Thomson Reuters database and regular reporting of financial metrics such as Tobinq, return on equity, total asset

turnover, current net cash flow, company scale, leverage, and capitalization. Additionally, GDP per capita data is sourced from the World Bank database, and the SDG Index data is obtained from the SDG transformation centre database. This comprehensive dataset enables a robust analysis of how ESG excellence influences corporate value in global oil and gas.

3.1.3. Data collection and processing

For this article research data are sourced from multiple reputable databases to ensure comprehensive and reliable measurements across all variables. The dependent variable, market worth Tobinq, defined as the ratio of the market value of share capital plus net liabilities to total assets, is sourced from Thomson Reuters. The independent variable, firm ESG outcome (ESG), representing the combined ESG score, is also obtained from Thomson Reuters. Intervening variables include ROE and total asset turnover, both sourced from Thomson Reuters. Control variables encompass firm scale (Size), leverage (Lev), cash flow ratio (CF), and capitalization (CAP), all sourced from Thomson Reuters, along with GDP per capita (GDP) from the World Bank and the SDG Index score (SDG) from the SDG Transformation Centre. This comprehensive dataset enables a robust analysis of how ESG excellence influences corporate value in the global oil and gas sector.

3.1.4. Data handling

Raw data collected were screened and standardized using Excel software to ensure accuracy and consistency. Aggregated firm-year data were combined, and entries lacking necessary financial information for key variables were omitted. Following these exclusions an imbalanced cross-sectional dataset (panel data) was obtained, encompassing 7036, firm-year observations corresponding to 960 chosen firms. Outliers were retained, but all variables were subjected to winsorized at the 1% level. The data were then analyzed using STATA software to perform regression analyses and test the relevant models. The use of STATA facilitates robust statistical analysis and ensures the reliability of the findings. This methodical approach to sample selection and data collection ensures that the research findings on the impact of ESG excellence on market worth in the global oil and gas sector are based on reliable and comprehensive data. The longitudinal nature of the dataset, covering 2011-2022, allows for a detailed analysis of trends and the impact of ESG practices over time.

3.2. Variable Design

To properly format the information from Table 1 which describes the definitions of variables and their selections for the study, it has been organized clearly and concisely.

3.2.1. Explained variable: Market value of the company

The market value of a company in this research is assessed using Tobinq. Tobinq is calculated as the sum of the market value of a company's share capital and the market value of its net liabilities, divided by its total assets. The formula is:

Tobinq = Market value of share capital + Market value of net liabilities/total assets

This ratio provides a comprehensive measure of a company's market value by capturing the expectations of both equity investors and creditors about the value of the company's assets. It is widely used to evaluate corporate valuation.

3.2.2. Explanatory variable: ESG excellence

In this research, ESG excellence is measured using the ESG combined score obtained from the Thomson Reuters database. This score aggregates various aspects of a firm's performance in ESG criteria, providing a comprehensive evaluation of its overall ESG effectiveness. The combined score reflects the company's adherence to the best practices and standards in ESG-related areas and is used as the explanatory variable in the study. This quantifiable measure allows for the analysis of how ESG excellence impacts the market value of companies within the global oil and gas sector.

3.2.3. Mediating variable: Financial performance

Financial performance in this study is distributed into two key indicators: profitability and operational capability. The indicators selected are ROE and total asset turnover (TATR), reflecting different aspects of a company's financial health.

ROE measures a company's efficiency in generating profit from its shareholders' equity, calculated as the ratio of net income to equity. A higher ROE indicates greater effectiveness in using equity capital for earnings. Total asset turnover evaluates how efficiently a company uses its assets to generate revenue, determined by the ratio of net operating income to total average assets. A higher TATR reflects more efficient asset utilization in generating sales.

3.2.4. Control variables

To ensure a comprehensive analysis, several control variables are included in the study, based on previous research. These control variables are essential for accounting for factors that might influence the relationship between ESG excellence and a company's market value:

Firm scale (Size) is measured by the natural logarithm of a company's total assets and is an essential control variable since larger companies often benefit from economies of scale and have different capabilities and motivations for managing ESG excellence compared to smaller firms. Leverage (Lev), defined as the ratio of total debt to total assets, and indicates the extent to which a company uses debt to finance its operations, with higher leverage potentially influencing ESG management practices due to varying risk preferences and strategies. The cash flow ratio (CF), calculated as current net cash flow divided by total assets at year-end, reflects a company's liquidity and financial flexibility. Capitalization (CAP) is measured as equity capital divided by total assets, indicating the proportion of assets financed by shareholders' equity; a higher ratio suggests a stronger equity base, which could affect ESG initiatives and market value. GDP per capita (GDP), sourced from the World Bank database, is measured as total output divided by the total population and represents the economic environment in which the company operates. The SDG index (SDG), sourced from the SDG transformation centre database, evaluates a country's progress towards achieving the sustainable development goals.

These control variables are essential in isolating the impact of ESG excellence on the market value of companies, providing a more accurate and comprehensive analysis. When using ROE as a mediating variable, TATR and other control variables are included to account for their potential impact on the explained and explanatory variables. Similarly, when TATR is used as a mediating variable, ROE and other control variables are included. This methodological approach ensures a robust analysis of the relationship between ESG performance and market value in the global oil and gas sector.

3.3. Model Development

3.3.1. ESG excellence and corporate valuation

Hypothesis H_1: ESG excellence positively impacts corporate valuation.

Model 1:

$$Tobinq_{it}=\alpha_1+\alpha_2 ESG_{it}+\alpha_3 Size_{it}+\alpha_4 Lev_{it}+\alpha_5 TATR_{it}+\alpha_6 GDP_{it}+\alpha_7 SDG_{it}+\alpha_8 CAP_{it}+\alpha_9 CF_{it}+\epsilon_{1it}$$

Here:

Tobinqit represents the Tobinq value of company $_i$ in year $_t$. The term α_1 is a constant, and ϵ_1 it is the error term. The coefficient α_2 indicates the effect of ESG excellence on company value, while α_3 to α_9 denote the coefficients that measure the impact of control variables (Size, Lev, TATR, GDP, SDG, CAP, and CF) on company value.

3.3.2. Financial metrics in relation to ESG excellence

Hypothesis H_{2a}: Superior ESG excellence leads to higher profitability.

Model 2:

$$ROE_{it}=\alpha_{10}+\alpha_{11} ESG_{it}+\alpha_{12} Size_{it}+\alpha_{13} Lev_{it}+\alpha_{14} TATR_{it}+\alpha_{15} GDP_{it}+\alpha_{16} SDG_{it}+\alpha_{17} CAP_{it}+\alpha_{18} CF_{it}+\epsilon_{2i}t$$

Here:

ROEit denotes the return on equity for company $_i$ in year $_t$. Here, α_{10} is the constant term, and $\epsilon 2_{it}$ is the error term. The coefficient α_{11} measures the effect of ESG excellence on profitability, while coefficients α_{12} to α_{18} gauge the impact of the control variables (Size, Lev, TATR, GDP, SDG, CAP, and CF) on profitability.

Hypothesis H_{2b}: ESG excellence impacts corporate value via operational efficiency.

Model 3:

$$Tobinq_{it}=\alpha_{19}+\alpha_{20} ESG_{it}+\alpha_{21} TATR_{it}+\alpha_{22} Size_{it}+\alpha_{23} Lev_{it}+\alpha_{24} ROE_{it}+\alpha_{25} GDP_{it}+\alpha_{26} SDG_{it}+\alpha_{27} CAP_{it}+\alpha_{28} CF_{it}+\epsilon_{5it}$$

Here:

$Tobinq_{it}$ represents the Tobinq value for company $_i$ in year $_t$. α_{19} is the constant term, and ϵ_{5it} is the error term. The coefficient α_{20} indicates the impact of ESG excellence on company value, while α_{21} reflects the effect of operational efficiency (TATR) on company value. Coefficients α_{22} through α_{28} measure the influence of the control variables (Size, Lev, ROE, GDP, SDG, CAP, and CF) on company value.

3.3.3. Financial metrics and corporate valuation

Hypothesis H_{3a}: ESG excellence influences corporate value through profitability.

Model 4:

$$Tobinq_{it}=\alpha_{29}+\alpha_{30} ESG_{it}+\alpha_{31} ROE_{it}+\alpha_{32} Size_{it}+\alpha_{33} Lev_{it}+\alpha_{34} TATR_{it}+\alpha_{35} GDP_{it}+\alpha_{36} SDG_{it}+\alpha_{37} CAP_{it}+\alpha_{38} CF_{it}+\epsilon_{4it}$$

Here:

Tobinqit denotes the Tobinq value for company $_i$ in year $_t$. α_{29} is the constant term, and $\epsilon 4_{it}$ is the error term. The coefficient α_{30} quantifies the impact of ESG performance on company value, while α_{31} measures the effect of profitability (ROE) on company value. The coefficients α_{32} through α_{38} represent the effects of control variables (Size, Lev, TATR, GDP, SDG, CAP, and CF) on company value.

Hypothesis H_{3b}: Superior ESG excellence enhances operational efficiency.

Model 5:

$$TATR_{it}=\alpha_{39}+\alpha_{40} ESG_{it}+\alpha_{41} Size_{it}+\alpha_{42} Levit+\alpha_{43} ROE_{it}+\alpha_{44} GDP_{it}+\alpha_{45} SDGit+\alpha_{46} CAP_{it}+\alpha_{47} CFit+\epsilon_{3it}$$

Here:

$TATR_{it}$ stands for the total asset turnover for company $_i$ in year $_t$. α_{39} is the constant term, and ϵ_{3it} is the error term. The coefficient α_{40} captures the effect of ESG excellence on operational efficiency, while α_{41} through α_{47} represent the effects of the control variables (Size, Lev, ROE, GDP, SDG, CAP, and CF) on operational efficiency.

Combining financial metrics to assess the overall impact of ESG excellence on corporate valuation.

Model 6:

$$Tobinq_{it}=\alpha_{48}+\alpha_{49} ESG_{it}+\alpha_{50} ROE_{it}+\alpha_{5}1 TATR_{it}+\alpha_{52} Size_{it}+\alpha_{53} Levit+\alpha_{54} GDPit+\alpha_{55} SDG_{it}+\alpha_{56} CAP_{it}+\alpha_{57} CF_{it}+\epsilon_{6it}$$

Here:

Tobinqit denotes the Tobinq value for company $_i$ in year $_t$. α_{48} is the constant term, and ϵ_{6it} is the error term. The coefficient α_{49} captures the effect of ESG excellence on company value, while α_{50} and α_{51} measure the impacts of profitability (ROE) and operational efficiency (TATR) on company value, respectively. Coefficients α_{52} through α_{57} represent the effects of the control variables (Size, Lev, GDP, SDG, CAP, and CF) on company value.

Model 1 assesses the direct impact of ESG excellence on corporate valuation, measured by Tobinq, with the significance of α_2 indicating if ESG performance directly influences worth. Model 2 evaluates ESG's impact on profitability (ROE), where a significant α_{11} would suggest a positive influence. Model 3 examines if operational efficiency (TATR) mediates the relationship between ESG excellence and corporate valuation, with the significance of α_{20} and α_{21} determining this mediation effect. Model 4 tests profitability as a mediator; if α_{30} remains significant but decreases relative to $\alpha_{2,}$ from Model 1, it indicates partial mediation, while a significant α_{31} and an insignificant α_{30} suggest complete mediation. Model 5 directly assesses ESG's impact on operational efficiency, indicated by α_{40}. Model 6 integrates profitability and operational efficiency to assess their combined mediation effects on the relationship between ESG excellence and corporate valuation, with the significance of α_{49}, α_{50}, and α_{51} demonstrating the overall impact. These models collectively aim to dissect the pathways through which ESG excellence impacts corporate valuation in the oil and gas sector. By sequentially analyzing the direct effects on market value, profitability, and operational efficiency, and then integrating these metrics, the study will provide a comprehensive understanding of how ESG excellence translates into corporate value. This structured approach ensures that the mediation effects of profitability and operational efficiency are rigorously tested and validated.

4. RESULTS ANALYSIS

4.1. Descriptive Statistics Results

The Table 2 presents the descriptive statistics of key variables analyzed in the study focused on enhancing corporate value through ESG excellence within the oil and gas industry. The Tobinq ratio, reflecting market valuation, exhibits an average of 1.273 with a standard deviation of 0.799, indicating notable variability across firms. The mean ESG score stands at 42.386 with a standard deviation of 19.972, highlighting moderate diversity in environmental, social, and governance practices among the companies studied. ROE averages 0.018, with a standard deviation of 0.435, illustrating varying profitability levels among firms. TATR shows a mean of 0.013 and a standard deviation of 0.252, pointing to differences in efficiency in asset utilization. Firm size, measured by the natural logarithm of total assets, has an average of 22.199 and a standard deviation of 1.919, indicating diversity in company sizes within the sector. Regarding financial structure, the average leverage ratio (Lev) is 0.287, with a standard deviation of 0.303, while the CAP averages 0.449, with a standard deviation of 0.385. Both ratios demonstrate significant variability across the sample, reflecting diverse financial strategies among oil and gas firms. The GDP per capita, representing economic conditions, averages 2.34 with a standard deviation of 3.172. Additionally, the SDG index score averages 70.807 with a standard deviation of 17.6, suggesting varying levels of progress towards sustainable development goals within the industry. In summary, these descriptive statistics provide insights into the heterogeneity across firms in terms of market valuation, ESG excellence, financial metrics, size, economic context, and sustainability efforts within the oil and gas sector.

Table 1: Definition and selection of variables

Variable types	Variable name	Variable code
Dependent variable	The market worth	Tobinq
Independent variable	Firm ESG outcome	ESG
Intervening variable	Return on equity	ROE
	Total asset turnover	TATR
Control variables	Firm scale	Size
	Leverage	Lev
	Capitalization	CAP
	GDP per capita	GDP
	SDG index	SDG

ESG: Environmental, social, and governance, GDP: Gross domestic product, SDG: Sustainable development goals

Table 2: Descriptive statistics

Variables	n	Mean	Max	Min	SD	Median
Tobinq	7036	1.273	12.674	0.14	0.799	1.101
ESG	7036	42.386	83.871	6.139	19.972	42.292
ROE	7036	0.018	1.645	−2.388	0.435	0.068
TATR	7036	0.013	1.889	−6.214	0.252	0.039
Size	7036	22.199	27.221	14.154	1.919	22.159
Lev	7036	0.287	7.946	0	0.303	0.253
CAP	7036	0.449	0.997	−7.82	0.385	0.466
GDP	7008	2.34	11.737	−11.167	3.172	2.294
SDG	7012	70.807	82.167	0	17.6	75.279

ESG: Environmental, social, and governance, GDP: Gross domestic product, SDG: Sustainable development goals

4.2. Analysis of Correlations

Table 3 presents the correlation matrix, highlighting significant relationships between variables. Tobinq is positively correlated with ROE, TATR, Lev, and GDP, and negatively correlated with ESG, Size, CAP, and SDG. ESG is positively correlated with ROE, TATR, size, lev, and SDG, but negatively correlated with CAP. VIF values, ranging from 1.03 to 3.84, indicate no severe multicollinearity issues. These results underscore the interconnectedness of ESG excellence, financial metrics, and corporate valuation, providing a comprehensive overview of the variables and their relationships in oil and gas sector.

4.3. ESG Excellence and Corporate Valuation

The regression result Table 4 reveals that the Model 1 shows that higher ESG scores are associated with lower Tobinq values (−0.004***), suggesting that ESG excellence may be perceived as a cost in the oil and gas sector. Control variables such as Size and Lev also negatively affect Tobinq, while TATR and GDP positively influence it. Model 2 indicates that ESG excellence does not significantly impact ROE directly (−0.0010), but larger firm size and higher TATR positively affect ROE, underscoring the importance of firm scale and asset efficiency in driving profitability. Model 3 demonstrates that ROE positively impacts Tobinq (0.099***), indicating that profitability enhances corporate valuation. TATR also positively affects Tobinq (0.205***), suggesting that operational efficiency is valued in the market. This supports the hypothesis that financial performance metrics like ROE and TATR have potential mediation effect of ESG excellence on the relationship between ESG excellence and corporate valuation within the oil and gas sector.

The regression analysis indicates that while ESG excellence is not directly perceived as value-enhancing in the oil and gas sector,

Table 3: Correlation analysis

Variables	Tobinq	ESG	ROE	TATR	Size	Lev	CAP	GDP	SDG	VIF
Tobinq	1									
ESG	−0.043***	1								1.33
ROE	0.122***	0.093***	1							1.34
TATR	0.041***	0.142***	0.481***	1						1.48
Size	−0.127***	0.486***	0.160***	0.242***	1					1.37
Lev	0.217***	0.045***	−0.044***	-0.257***	−0.004	1				3.84
CAP	−0.305***	−0.083***	−0.007	0.192***	−0.062***	−0.851***	1			3.7
GDP	0.045***	−0.001	0.168***	0.161***	0.040***	−0.070***	0.039***	1		1.03
SDG	−0.081***	0.068***	−0.008	0.008	0.024**	−0.221***	0.184***	0.068***	1	1.07

***P<0.01, **P<0.05, *P<0.1

Table 4: Regression analysis of Model 1, Model 2 and Model 3

Variables	Model 1	Model 2	Model 3
	Tobinq	ROE	Tobinq
ESG	−0.004***	−0.0010	−0.004***
	(0.0010)	(0.0010)	(0.0010)
ROE	-	-	0.099***
	-	-	(0.0140)
TATR	0.276***	0.713***	0.205***
	(0.0240)	(0.0220)	(0.0260)
Size	−0.215***	0.032**	−0.218***
	(0.0150)	(0.0140)	(0.0150)
Lev	−.126**	0.0730	−0.133**
	(0.0520)	(0.0470)	(0.0520)
CAP	−0.955***	−0.114***	−0.944***
	(0.0390)	(0.0350)	(0.0390)
GDP	0.009***	0.015***	0.008***
	(0.0020)	(0.0020)	(0.0020)
SDG	−0.064***	0.0040	−0.065***
	(0.0050)	(0.0040)	(0.0050)
Constant term	11.209***	−0.982**	11.306***
	(0.4680)	(0.4170)	(0.4670)
Observations	7008	7008	7008
Fixed effects	Yes	Yes	Yes
Hausman Prob>Chi-square	0.0000	0.0000	0.0000

Standard errors are in parentheses ***P<0.01, **P<0.05, *P<0.1

Table 5: Regression analysis of Model 4 , Model 5 and Model 6

Variables	Model 4	Model 5	Model 6
	Tobinq	TATR	Tobinq
ESG	−0.004***	0.00049*	−0.004***
	(0.0010)	(0.0600)	(0.0010)
TATR	-	-	0.205***
	-	-	(0.0260)
ROE	0.142***	0.211***	0.099***
	(0.0130)	(0.0060)	(0.0140)
Size	−0.205***	0.06***	−0.218***
	(0.0150)	(0.0070)	(0.0150)
Lev	−0.185***	−0.25***	−0.133**
	(0.0520)	(0.0250)	(0.0520)
CAP	−0.947***	−0.017	−0.944***
	(0.0390)	(0.0190)	(0.0390)
GDP	0.009***	0.006***	0.008***
	(0.0020)	(0.0010)	(0.0020)
SDG	−0.065***	−0.001	−0.065***
	(0.0050)	(0.0020)	(0.0050)
Constant term	11.064***	−1.176***	11.306***
	(0.4680)	(0.2260)	(0.4670)
Observations	7008	7008	7008
Fixed effects	Yes	Yes	Yes
Hausman Prob >Chi-square	0.0000	0.0000	0.0000

Standard errors are in parentheses ***P<0.01, **P<0.05, *P<0.1

its impact on corporate valuation is mediated by profitability and operational efficiency. Firms that effectively convert ESG efforts into improved profitability and asset efficiency are likely to see positive effects on their market valuation. Thus, enhancing profitability and operational efficiency can be key strategies for firms aiming to leverage ESG excellence for boosting corporate value.

4.4. Financial Metrics and Corporate Valuation

The regression result 0f the Table 5 reveals that the Model 4 shows that ESG remains negatively associated with Tobinq (−0.004***), while ROE positively impacts it (0.142***), underscoring the importance of profitability in enhancing corporate valuation and suggesting that market participants in the oil and gas sector may view high ESG expenditures as detracting from firm value. In Model 5, ESG has a marginally positive effect on TATR (0.00049*), indicating a weak association between ESG excellence and operational efficiency, implying that ESG efforts may slightly improve asset use efficiency. Model 6 continues to show a negative impact of ESG on Tobinq (−0.004***), while both ROE (0.099***) and TATR (0.205***) positively effect it, highlighting that the benefits of ESG excellence on corporate valuation are mediated through improved profitability and operational efficiency, supporting the hypothesis of mediation effects.

The regression analysis indicates that ESG excellence negatively correlates directly with corporate valuation in the oil and gas sector. However, its indirect benefits through enhanced profitability and operational efficiency are found to be significant. Firms that successfully translate ESG efforts into improved financial performance can mitigate the negative perception and enhance their market value. This underscores the importance of focusing on profitability and operational efficiency to leverage ESG initiatives for boosting corporate valuation.

5. CONCLUSION AND IMPLICATIONS

This research levelled to study the relationship between ESG excellence and corporate value in the oil and gas industry. Specifically, it sought to understand how superior ESG excellence can enhance market worth and attract investment within this sector. The study addressed the problem statement: “To what extent does ESG excellence influence corporate valuation in the oil and gas

industry and through what mechanisms do financial performance metrics mediate this relationship?"

The empirical analysis revealed that while ESG excellence directly correlates negatively with corporate valuation, its indirect benefits through enhanced profitability and operational efficiency are significant. Firms that effectively convert ESG efforts into improved profitability and asset efficiency are likely to see positive effects on their market valuation. The study found that ESG excellence does not significantly impact profitability directly, but contributes to improved operational efficiency, which in turn enhances corporate valuation. These findings validate the hypotheses that profitability and operational efficiency mediate the relationship between ESG excellence and corporate valuation.

Key takeaways from this research include the importance of profitability and operational efficiency as mediators in the relationship between ESG excellence and corporate valuation. While ESG practices may not be directly perceived as value-enhancing, their ability to improve financial performance metrics is crucial. For stakeholders, this underscores the need to focus on converting ESG efforts into tangible financial benefits.

The implications of these findings are significant for policymakers, corporate strategists, and investors. Policymakers should promote robust ESG regulations to enhance sustainable development within the oil and gas sector. Corporate strategists should prioritize ESG initiatives not only for compliance but also as strategic tools for enhancing market value and operational efficiency. Investors should incorporate ESG considerations into their investment decisions to achieve sustainable returns, recognizing the long-term financial benefits of strong ESG excellence.

In conclusion, this research provides compelling evidence that ESG practices, when effectively integrated into business strategies, can significantly enhance a firm's market value and operational efficiency. As global markets increasingly prioritize sustainability, oil and gas companies that adopt strong ESG practices will be better positioned for long-term financial success and competitiveness.

Future research should explore industry-specific analysis to investigate the impact of ESG practices across different sectors within the oil and gas industry. Longitudinal studies are needed to assess the long-term effects of ESG practices on financial performance and market value. Expanding analysis to include emerging markets would provide comparative insights into the effectiveness of ESG practices in different economic contexts. Additionally, developing and utilizing more sophisticated ESG metrics will help capture the nuanced impacts of individual ESG components on financial performance and corporate valuation. These future directions will provide deeper insights for stakeholders aiming to foster sustainable and profitable growth in the oil and gas sector.

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