Journal of Economics, Entrepreneurship, Management Business and Accounting, 2024, 4(4), 1295-1314.
https://doi.org/10.61255/jeemba.v4i4.1238

ESG Disclosure and Firm Value the Moderating Role of Corporate Governance in Energy Sector Companies

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ABSTRACT

Purpose – This study aims to investigate the effect of Environmental, Social, and Governance (ESG) disclosure on firm value, while examining the moderating role of corporate governance in energy sector companies listed on the Indonesia Stock Exchange during the 2020–2024 period.
Design/methodology/approach – A quantitative research design was employed using secondary data collected from annual reports, sustainability reports, and corporate financial statements. The sample was determined through purposive sampling, focusing on energy sector firms consistently listed on the Indonesia Stock Exchange throughout the observation period. Data analysis was conducted using panel data regression with the assistance of EViews 13 software.
Finding/Results – The empirical results reveal that ESG disclosure has a positive and significant effect on firm value. Furthermore, corporate governance, measured by the proportion of independent commissioners, was found to strengthen the relationship between ESG disclosure and firm value. These findings indicate that the effectiveness of ESG practices in enhancing corporate value becomes more substantial when supported by strong governance quality.
Originality/Value – This study contributes empirical evidence regarding the association between ESG disclosure and firm value within Indonesia's energy sector by incorporating corporate governance as a moderating variable. In addition, the findings extend the relevance of signaling theory and agency theory in explaining how ESG disclosure and governance mechanisms shape investor responses toward energy companies.

ARTICLE INFO

Keywords:
ESG Disclosure, Firm Value, Corporate Governance, Sustainability Reporting, Energy Sector

Article Information:
Received: 30/04/2026
Revise: 20/06/2026
Accepted: 16/07/2026

ISSN:
2985-3168 (Online)
2985-3222 (Print)

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1. Introduction

Growing investor awareness of sustainable business practices has encouraged companies to expand the disclosure of non financial information as part of their strategy to maintain and enhance firm value. Environmental, Social, and Governance (ESG) disclosure is no longer viewed merely as an administrative compliance mechanism; instead, it has evolved into a critical indicator for assessing corporate quality, risk management capability, and long term business sustainability. This transformation has been driven by increasing global concerns regarding climate change, the transition toward clean energy, and stronger demands for corporate transparency within modern capital markets. In recent years, investors have increasingly incorporated ESG related information into their investment considerations, as firms with extensive ESG disclosure are generally perceived to possess lower long term risk exposure and greater sustainability prospects compared to companies with limited ESG disclosure. Consequently, ESG practices have become an important strategic instrument for building investor confidence and strengthening market valuation, particularly in industries characterized by high environmental exposure and sustainability challenges (Aydogmus et al., 2022; Gillan et al., 2021).

The implementation of ESG practices has also expanded considerably in Indonesia over the past several years. The Indonesia Stock Exchange (IDX) reported that 882 listed companies, representing approximately 94% of all public firms, had published sustainability reports by the end of 2024. This trend reflects the growing commitment of Indonesian public companies toward sustainability disclosure, particularly following the strengthening of sustainable finance regulations introduced by the Financial Services Authority through POJK No. 51/POJK.03/2017 concerning the Implementation of Sustainable Finance. In parallel, the IDX has continued to reinforce ESG integration through the development of the IDX ESG Leaders Index, which consists of companies demonstrating superior ESG performance and relatively low controversy exposure. These developments suggest that ESG disclosure is increasingly perceived as a strategic mechanism for enhancing investor trust and maintaining corporate competitiveness within the Indonesian capital market.

The increasing market attention toward ESG can also be observed through the performance of the IDX ESG Leaders Index, which has shown a positive growth trend since its introduction in 2020. According to CEIC data, the index increased from 120.208 in July 2021 to 167.237 in August 2024, indicating a stronger market response toward firms with broader ESG disclosure. Nevertheless, the growing adoption of ESG practices has not always been accompanied by a consistent increase in firm value, particularly among companies operating in the energy sector. Several energy companies that actively improved their sustainability disclosure continued to experience fluctuations in firm value, as reflected in Tobin's Q and Price to Book Value (PBV). This condition implies that the market does not necessarily respond uniformly to ESG disclosure practices, especially in industries characterized by substantial operational and environmental risk exposure.

Table 1. ESG and Firm Value Phenomena in the Indonesian Capital Market

Indicator	Empirical Condition
Companies publishing sustainability reports	882 companies or approximately 94% of IDX-listed firms in 2024
IDX ESG Leaders Index	Consists of 30 companies with the strongest ESG performance

Indicator	Empirical Condition
IDX ESG Leaders Index value in July 2021	120,208
IDX ESG Leaders Index value in August 2024	167,237
Energy sector condition	ESG disclosure has increased, while firm value continues to fluctuate

Source: Indonesia Stock Exchange and CEIC Data (2024–2025)

The energy sector represents one of the most relevant industries in the implementation of ESG practices due to its direct association with carbon emissions, natural resource exploitation, and the global energy transition agenda. On one hand, the sector contributes significantly to national economic growth and market capitalization within the Indonesia Stock Exchange. On the other hand, energy companies are exposed to substantial pressure related to emission reduction, environmental sustainability, and the transition toward low carbon energy systems. As a consequence, firms operating in this sector face a complex challenge in balancing corporate profitability with the growing sustainability expectations imposed by investors and regulators. This situation makes ESG disclosure in the energy sector considerably more sensitive than in many other industries, as it is closely linked to market risk perception and the long-term sustainability of corporate operations.

The growing relevance of ESG issues has encouraged extensive research examining the relationship between ESG disclosure and firm value. Several prior studies have documented that ESG disclosure positively affects firm value by strengthening corporate reputation, reducing information asymmetry, and enhancing investor confidence regarding the company’s long term prospects (Aydogmus et al., 2022; Friede et al., 2015; Velte, 2017). Nevertheless, empirical findings remain inconclusive. Some studies indicate that ESG disclosure does not consistently generate a significant impact on firm value, particularly in developing countries and environmentally sensitive industries such as the energy sector (Gillan et al., 2021; Kumar & Firoz, 2022). In certain cases, enhanced sustainability disclosure has not been sufficient to improve market valuation because investors continue to place greater emphasis on short term financial performance rather than on corporate sustainability information.

The inconsistency of prior empirical findings suggests that the relationship between ESG disclosure and firm value may be influenced by additional factors capable of strengthening or weakening investor responses toward corporate ESG implementation. In this context, corporate governance is considered an essential mechanism for enhancing the quality and credibility of ESG disclosure. Effective corporate governance enables ESG practices to be implemented in a more transparent, accountable, and consistent manner, thereby increasing investor confidence in the non financial information disclosed by the company. Conversely, weak governance structures may cause ESG practices to become merely symbolic or limited to fulfilling regulatory expectations without generating meaningful economic value for the firm. Accordingly, corporate governance is expected to reinforce the relationship between ESG disclosure and firm value, as investors are generally more responsive to sustainability initiatives undertaken by companies with strong governance quality (Buallay, 2019; Qureshi et al., 2020).

Although the relationship between ESG disclosure and firm value has received considerable attention in the literature, several unresolved issues remain. First, previous studies have produced inconsistent findings regarding the value relevance of ESG disclosure. While some studies report that ESG disclosure enhances firm value through improved transparency, reputation, and stakeholder trust, other studies suggest that investors do not always respond positively to ESG initiatives, particularly in emerging markets and environmentally sensitive industries where sustainability disclosures may be perceived as symbolic rather than substantive. Second, most prior studies focus primarily on the direct relationship between ESG disclosure and firm value, while limited attention has been devoted to understanding the governance conditions under which ESG disclosure becomes more valuable to investors. In particular, the role of independent commissioners in enhancing the credibility and effectiveness of ESG disclosure remains insufficiently explored. This issue is important because investors may evaluate not only the quantity of ESG information disclosed but also the governance mechanisms responsible for ensuring the reliability of such disclosures. Third, empirical evidence from Indonesian energy sector companies remains relatively limited despite the sector's strategic importance and its substantial exposure to environmental risk, carbon transition challenges, and sustainability regulations. Furthermore, the period of 2020–2024 represents a unique context characterized by post-pandemic economic recovery, increasing implementation of sustainable finance regulations, growing investor attention to ESG issues, and the expansion of the IDX ESG Leaders Index. These developments may influence how investors interpret ESG disclosure and governance quality when assessing firm value in energy companies.

Beyond examining corporate governance as a moderating variable, this study contributes by focusing on the Indonesian energy sector during a period characterized by post-pandemic recovery, increasing ESG-related regulatory pressure, and growing concerns regarding the credibility of sustainability disclosures in emerging markets. Unlike developed markets where ESG reporting systems are relatively mature, investors in emerging economies often face uncertainty regarding whether ESG disclosures reflect substantive sustainability commitments or merely symbolic reporting practices. Therefore, this study provides additional insight into whether board independence enhances the credibility and value relevance of ESG disclosure under conditions of increasing sustainability scrutiny and energy-transition pressure.

This study extends the existing literature by examining corporate governance, represented by the proportion of independent commissioners, as a moderating mechanism in the relationship between ESG disclosure and firm value. Unlike many previous studies that position corporate governance as an independent or control variable, this research investigates whether governance quality strengthens the credibility and value relevance of ESG disclosure within Indonesian energy sector companies operating during a period of heightened sustainability pressure and market transformation. This study therefore contributes by explaining not only whether ESG disclosure influences firm value, but also under what governance conditions ESG disclosure becomes more value-relevant to investors

Based on these considerations, this study aims to analyze the effect of ESG disclosure on firm value with corporate governance serving as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange. This research is expected to contribute theoretically to the development of the ESG and firm value literature, particularly by explaining the role of corporate governance in strengthening the relationship between ESG disclosure and corporate value creation. In addition, the study provides empirical evidence within the context of Indonesian energy companies, which are currently facing increasing pressure to transition toward sustainable business practices alongside growing demands for ESG transparency from investors and regulators.

2. Literature Review & Hypothesis Development

2.1. Agency Theory

Agency theory explains the relationship between shareholders as principals and management as agents responsible for conducting the company's operational activities. Within this relationship, conflicts of interest frequently arise due to differences in objectives between management and shareholders, as well as the unequal distribution of information between both parties. Management generally possesses greater access to internal corporate information than investors, creating the potential for information asymmetry and opportunistic behavior that may ultimately disadvantage shareholders.

In the context of Environmental, Social, and Governance (ESG) disclosure, agency theory suggests that ESG reporting is not always conducted solely to enhance firm value, but may also be utilized as a strategic tool to strengthen corporate image and improve managerial reputation. Under certain circumstances, management may engage in excessive ESG disclosure without being accompanied by substantive sustainability implementation, leading investors to question the credibility of the ESG information communicated by the company. This issue becomes particularly relevant in developing countries, where monitoring mechanisms and corporate governance quality often vary significantly across firms (Lestari et al., 2025). Corporate governance is therefore viewed as an important monitoring mechanism capable of mitigating conflicts of interest between management and shareholders. Strong governance practices enable more effective supervision of ESG implementation, thereby improving the credibility and reliability of the sustainability information disclosed by companies. Consequently, corporate governance is expected to strengthen the relationship between ESG disclosure and firm value, as investors tend to respond more positively to firms characterized by higher governance quality (Sari et al., 2025).

2.2. Signaling Theory

Signaling theory explains that companies attempt to convey signals to the market through the disclosure of information capable of reducing investor uncertainty regarding corporate conditions and future prospects. Information published by companies serves as an important basis for investors in evaluating firm quality and making investment decisions. Within capital markets, firms that disclose information more transparently generally obtain higher levels of investor confidence compared to companies with lower transparency standards. In the context of contemporary business practices, Environmental, Social, and Governance (ESG) disclosure has evolved into an important form of non financial signaling used by companies to demonstrate management quality, risk management capability, and long term business sustainability. Firms with strong ESG disclosure are commonly perceived as having greater capacity to maintain operational stability and manage environmental and social risks in the future. Consequently, ESG disclosure is expected to strengthen positive investor perceptions toward the company and ultimately contribute to higher firm value (Aydogmus et al., 2022). Within the energy sector, signaling theory becomes increasingly relevant because the industry is characterized by substantial environmental risk exposure and faces significant pressure associated with climate change and the global energy transition. Energy companies that provide more transparent ESG disclosure are generally viewed as having a stronger commitment to sustainability, thereby encouraging more favorable investor responses toward the company.

2.3. Legitimacy Theory

Legitimacy theory explains that companies seek to maintain social legitimacy through activities and disclosures that align with societal values, norms, and expectations. Firms require legitimacy from stakeholders to ensure that their operational activities are accepted and continue to receive long term social support. In this context, ESG disclosure is viewed as a mechanism through which companies demonstrate that their business operations are consistent with public expectations regarding environmental and social responsibility. The relevance of legitimacy theory becomes particularly significant in the energy sector because this industry is characterized by high environmental exposure and frequently attracts public attention related to carbon emissions, natural resource exploitation, and other environmental impacts. Pressure from regulators, investors, and society has encouraged energy companies to demonstrate stronger sustainability commitments through broader and more transparent ESG disclosure practices. Consequently, ESG disclosure serves not only as a strategic effort to maintain social legitimacy, but also as a means of reducing external pressure surrounding corporate operational activities (Khamisu & Paluri, 2024). In addition, the expansion of sustainability reporting regulations and the growing investor focus on sustainable business practices have further motivated companies to improve the quality of ESG disclosure. Firms that successfully maintain social legitimacy through effective ESG implementation are expected to possess stronger corporate reputations and receive more favorable market responses compared to companies with lower levels of ESG disclosure.

2.4. ESG Disclosure

Environmental, Social, and Governance (ESG) disclosure refers to the disclosure of non-financial information related to a company's environmental, social, and governance practices as a form of transparency toward investors and other stakeholders. ESG disclosure has evolved as an integral component of sustainability reporting, aimed at providing information regarding a company's responsibility toward environmental and social sustainability. The environmental dimension relates to the company's ability to manage the environmental impacts arising from its operational activities, including carbon emission management, energy efficiency, and the utilization of natural resources. The social dimension concerns the company's relationship with employees, consumers, and surrounding communities. Meanwhile, the governance dimension focuses on corporate governance quality, transparency, and supervisory mechanisms within the organization (Bashatweh et al., 2022). In recent years, ESG disclosure has gained increasing importance as investors have begun incorporating non-financial information into their assessment of corporate quality and long term business prospects. ESG disclosure is widely perceived as capable of enhancing corporate reputation, reducing information asymmetry, and strengthening investor confidence in the company (Bridge, 2024; Gillan et al., 2021).

2.5. Firm Value

Firm value reflects investor perceptions regarding a company's level of success, which is commonly represented through its market value. Corporate value serves as an important indicator in evaluating company performance because it illustrates the degree of investor confidence in the firm's future prospects. Higher firm value generally indicates greater shareholder wealth and stronger corporate attractiveness from the perspective of investors. In capital market research, firm value is frequently measured using Tobin's Q, as this indicator is considered capable of capturing how the market evaluates the company’s overall assets. A high Tobin’s Q value indicates that investors hold positive expectations regarding the company’s future growth and long term sustainability. Within the context of ESG implementation, investors tend to assign higher valuations to companies with stronger ESG disclosure quality because such firms are perceived to possess lower long term risk exposure and more effective corporate management practices. Consequently, ESG disclosure is expected to enhance firm value by strengthening corporate reputation and increasing investor confidence in the company (Aydogmus et al., 2022; Zulianto & Aisjah, 2025)

2.6. Corporate Governance

Corporate governance refers to the system of corporate management and supervision designed to regulate the relationship between company management, shareholders, and other stakeholders. The primary objective of corporate governance is to ensure that companies operate in a transparent, accountable, and responsible manner in accordance with the interests of shareholders and stakeholders. Effective corporate governance plays an important role in improving the quality of corporate decision making while simultaneously reducing conflicts of interest between management and shareholders. Within the context of ESG disclosure, corporate governance functions as a monitoring mechanism that ensures ESG implementation is conducted more effectively and transparently. Companies characterized by strong governance quality generally produce more credible ESG disclosure, thereby increasing investor confidence in the company. In addition, corporate governance is considered capable of strengthening the relationship between ESG disclosure and firm value. Investors tend to respond more favorably to firms with sound governance practices because such companies are perceived to have lower agency problems and higher information disclosure quality. Accordingly, corporate governance in this study is positioned as a moderating variable that is expected to strengthen the effect of ESG disclosure on firm value in energy sector companies.

2.7. Theoretical Framework

This study integrates legitimacy theory, signaling theory, and agency theory to explain how ESG disclosure influences firm value. Legitimacy theory suggests that energy sector companies face substantial pressure from regulators, investors, and society to demonstrate responsible environmental and social practices. As a result, firms disclose ESG information to maintain legitimacy and align their operations with stakeholder expectations. From a signaling perspective, ESG disclosure serves as a strategic signal that communicates corporate quality, sustainability commitment, and long-term business prospects to investors. Higher levels of ESG disclosure may reduce information asymmetry and strengthen investor confidence regarding the company's future performance.

The effectiveness of ESG disclosure as a market signal depends on its perceived credibility. Agency theory argues that governance mechanisms are necessary to mitigate managerial opportunism and ensure the reliability of corporate disclosures. Independent commissioners play an important monitoring role by overseeing managerial actions and enhancing the credibility of sustainability reporting. Consequently, investors are expected to respond more positively to ESG disclosure when it is supported by stronger corporate governance. Therefore, corporate governance is expected to strengthen the positive relationship between ESG disclosure and firm value.

3. Methodology

This study employs a quantitative research approach to examine the effect of ESG disclosure on firm value, with corporate governance serving as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange. A quantitative approach was selected because the study focuses on testing the relationships among variables using numerical data and statistical analysis, thereby enabling hypotheses to be evaluated objectively and systematically. The data utilized in this research consist of secondary data obtained from annual reports, sustainability reports, and financial statements of energy sector companies published through the official website of the Indonesia Stock Exchange as well as the respective corporate websites. The observation period covers 2020–2024. This period was chosen due to the increasing implementation of sustainability reporting and the strengthening of ESG practices among Indonesian public companies following the enactment of POJK No. 51/POJK.03/2017 concerning the Implementation of Sustainable Finance.

The population of this study includes all energy sector companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The sampling technique employed was purposive sampling based on several criteria, namely: companies that were consistently listed throughout the observation period, published complete annual reports and sustainability reports, provided data relevant to the research requirements, and used Indonesian Rupiah in their financial statements. Companies with incomplete disclosures, unavailable sustainability information, or missing financial data were excluded from the sample. The sample selection process is presented in Table 2.

Table 2. Sample Selection Procedure

Criteria	Number of Firms
Energy sector companies listed on the Indonesia Stock Exchange during 2020–2024	30
Companies without complete sustainability reports	(5)
Companies with incomplete annual reports and financial statements	(3)
Companies with insufficient ESG disclosure information	(2)
Final sample	**20**

Source: Data processed (2026)

Based on the sample selection process, 20 energy sector companies met all research criteria and were included in the final sample. Given the five year observation period from 2020 to 2024, the study obtained 100 firm year observations. The panel dataset was balanced because all selected companies consistently provided the required information throughout the observation period. Companies with incomplete annual reports, sustainability reports, or financial data were excluded during the sample selection stage. Consequently, no missing observations were included in the final dataset used for statistical analysis.

Firm value in this study is proxied by Tobin's Q because this ratio is considered capable of reflecting how the market values the company's overall assets. Tobin's Q is calculated by comparing the market value of equity plus total debt to the company's total assets. The use of Tobin's Q is regarded as particularly relevant in capital market research because it captures investor perceptions regarding the company's future growth prospects and sustainability. Prior to the estimation process, the dataset was reviewed to ensure consistency and completeness of the information reported by each company. Observations containing incomplete disclosures or unavailable financial information were excluded during the sample selection process. As a result, the final dataset consisted only of observations that satisfied all research requirements

$$Tobin's\ Q = \frac{MVE + Debt}{Total\ Assets}$$

ESG disclosure is measured using an ESG Disclosure Index developed based on the Global Reporting Initiative (GRI) Standards (Standards, 2021). The study adopts an unweighted disclosure approach in which each ESG disclosure item receives equal importance. A score of 1 is assigned if a particular ESG item is disclosed in the company's annual report or sustainability report, while a score of 0 is assigned if the item is not disclosed. The ESG Disclosure Index is subsequently calculated by dividing the total number of disclosed ESG items by the total number of ESG items included in the disclosure checklist.

The disclosure checklist consists of environmental, social, and governance indicators adapted from the GRI Standards framework. Environmental indicators include disclosures related to energy consumption, emissions management, waste management, environmental compliance, and resource utilization. Social indicators include employee welfare, occupational health and safety, diversity and inclusion, community involvement, and customer responsibility. Governance indicators include board structure, ethical conduct, risk management, stakeholder engagement, and corporate compliance. The content analysis process was conducted using publicly available annual reports and sustainability reports, and all disclosures were evaluated using consistent coding criteria throughout the observation period. ESG disclosure was assessed through content analysis of annual reports and sustainability reports with reference to the GRI Standards framework. The assessment focused on the presence or absence of ESG related disclosure categories reported by each company. A binary scoring approach was applied consistently across all observations, where a score of 1 indicated that the disclosure category was reported and 0 otherwise. The ESG Disclosure Index is calculated as follows:

$$ESGDI = \frac{\sum Xi}{N}$$

Where:

ESGDI = ESG Disclosure Index

Xi = ESG item disclosed by the company

N = Total ESG disclosure items assessed

Corporate governance in this study is proxied by the proportion of independent commissioners. This proxy was selected because independent commissioners play an important role in strengthening board oversight, reducing agency conflicts, and enhancing the credibility of corporate disclosures. In the context of ESG implementation, independent commissioners are expected to improve transparency and accountability, thereby increasing investor confidence in sustainability related information disclosed by the company. The proportion of independent commissioners is measured by dividing the number of independent commissioners by the total number of members of the board of commissioners. Although corporate governance consists of various dimensions, the proportion of independent commissioners is considered particularly relevant because it directly reflects the effectiveness of the board's monitoring function in overseeing management actions and ensuring the credibility of ESG disclosure.

Although corporate governance encompasses multiple dimensions, this study specifically focuses on board independence as represented by the proportion of independent commissioners. Therefore, the findings should be interpreted as evidence regarding the monitoring role of board independence rather than the overall effectiveness of corporate governance systems.

$$IC = \frac{Number\ of\ Independent\ Commissioners}{Total\ Board\ of\ Commissioners}$$

To provide a clearer understanding of the operationalization of the research variables, the measurement of each variable is presented in the following table

Table 3. Operationalization of Research Variables

Variable	Measurement	Scale	Reference
Firm Value	Tobin's Q = (MVE + Debt) / Total Assets	Ratio	(Aydogmus et al., 2022)
ESG Disclosure	ESG Disclosure Index based on GRI Standards	Ratio	(Standards, 2021)
Corporate Governance	Proportion of Independent Commissioners	Ratio	(Buallay, 2019)

Source: Data processed (2026)

The data analysis technique employed in this study is panel data regression using EViews 13 software. Panel data regression was selected because the research utilizes a combination of cross sectional and time series data, enabling more reliable and comprehensive estimation results compared to conventional regression methods. In addition, panel data analysis allows the relationships among variables to be examined while considering the specific characteristics of each company throughout the observation period.

The analytical procedures in this study include descriptive statistical analysis, panel regression model selection through the Chow test and Hausman test, panel data regression analysis, moderating effect analysis, hypothesis testing using the t-test, and evaluation of the coefficient of determination (R^2). The Fixed Effect Model was selected because it accommodates firm-specific heterogeneity and provides more reliable estimates for panel data consisting of multiple firms observed over time.

Baseline Model

$$FVit = \alpha + \beta 1ESGit + \varepsilon it$$

Moderation Model

$$FVit = \alpha + \beta 1ESGit + \beta 2CGit + \beta 3(ESGit \times CGit) + \varepsilon it$$

Where:

FV = Firm Value

ESG = ESG Disclosure

CG = Corporate Governance

ESG × CG = Interaction term between ESG Disclosure and Corporate Governance

α = Constant

β1–β3 = Regression coefficients

ε = Error term

The moderating effect was examined using an interaction term between ESG Disclosure and Corporate Governance. A positive and significant interaction coefficient indicates that corporate governance strengthens the relationship between ESG disclosure and firm value

4. Results and Discussion

4.1. Result

4.1.1 Descriptive Statistics

Descriptive statistics are employed to provide a general overview of the characteristics of the research data, including the minimum value, maximum value, mean, and standard deviation of each research variable. The variables examined in this study consist of ESG disclosure as the independent variable, firm value proxied by Tobin's Q as the dependent variable, and corporate governance proxied by the proportion of independent commissioners as the moderating variable.

Table 4. Descriptive Statistics Results

Variable	Minimum	Maximum	Mean	Std. Deviation
ESG Disclosure	0.320	0.910	0.618	0.143
Tobin's Q	0.455	8.081	1.972	1.426
Independent Commissioners	0.250	0.750	0.418	0.112

Source: Data processed (2026)

Based on Table 4, the ESG disclosure variable has an average value of 0.618, indicating that energy sector companies in Indonesia disclosed approximately 61.8% of ESG items within their sustainability reports. The maximum ESG disclosure value of 0.910 suggests that several companies have implemented relatively extensive ESG reporting practices, whereas the minimum value of 0.320 indicates that some firms still maintain relatively low levels of ESG disclosure. The standard deviation value of 0.143 demonstrates a moderate level of variation in ESG disclosure among companies, implying that ESG implementation across Indonesian energy firms remains uneven.

Firm value, proxied by Tobin's Q, shows an average value of 1.972. This finding indicates that, in general, energy sector companies possess market values exceeding the book value of their assets. The maximum Tobin's Q value of 8.081 reflects the existence of companies receiving exceptionally high market appreciation, while the minimum value of 0.455 indicates that certain firms continue to experience relatively low market valuation. The standard deviation of 1.426 suggests substantial variation in firm value among energy sector companies. This condition implies that investor responses toward energy firms remain highly diverse, particularly in relation to corporate growth prospects, operational risk exposure, and sustainability implementation.

The corporate governance variable, proxied by the proportion of independent commissioners, has an average value of 0.418. This result indicates that, on average, energy sector companies have complied with the minimum requirement for independent commissioners as regulated within the Indonesian capital market framework. The maximum value of 0.750 suggests that several companies possess relatively stronger monitoring quality through a greater presence of independent commissioners within the corporate governance structure. Furthermore, the standard deviation value of 0.112 indicates that the variation in the proportion of independent commissioners among companies is relatively lower compared to the other research variables.

Overall, the descriptive statistical results indicate that energy sector companies in Indonesia have increasingly strengthened ESG disclosure implementation as part of sustainable business practices. Nevertheless, the substantial variation in firm value suggests that improvements in

ESG disclosure are not always responded to uniformly by the market. This condition implies the presence of additional factors that may influence the relationship between ESG disclosure and firm value, one of which is the quality of corporate governance.

4.1.2 Panel Data Regression Model Selection

Prior to hypothesis testing, panel data regression model selection was conducted to determine the most appropriate estimation model for this study. The model selection process involved the Chow test, Hausman test, and Lagrange Multiplier (LM) test. These tests were employed to identify whether the Common Effect Model (CEM), Fixed Effect Model (FEM), or Random Effect Model (REM) was the most suitable approach for analyzing the research data.

Table 5. Chow Test Results

Effect Test	Statistic	Prob.
Cross-section F	5.842	0.0000
Cross-section Chi-square	61.377	0.0000

Source: Data processed (2026)

Based on the Chow test results presented in Table 5, the probability value is 0.0000, which is lower than the significance level of 0.05. This result indicates that the Fixed Effect Model is more appropriate than the Common Effect Model for analyzing the research data. Therefore, the analysis was continued using the Hausman test to determine the most suitable model between the Fixed Effect Model and the Random Effect Model.

Table 6. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Prob.
Cross-section Random	9.284	0.026

Source: Data processed (2026)

The Hausman test results presented in Table 6 indicate a probability value of 0.026, which is lower than the significance threshold of 0.05. This finding suggests that the Fixed Effect Model is more appropriate than the Random Effect Model for this study. Accordingly, the panel data regression analysis in this research employs the Fixed Effect Model. The selection of the Fixed Effect Model implies that each energy sector company possesses distinct characteristics that may influence the relationship between ESG disclosure and firm value. The use of the Fixed Effect Model is therefore considered more suitable because it is capable of accommodating heterogeneity across firms, resulting in more accurate estimation outcomes compared to alternative panel regression models.

4.1.3 Panel Data Regression Results

After determining the most appropriate panel data regression model, the regression analysis was subsequently conducted to examine the effect of ESG disclosure on firm value, with corporate governance serving as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange.

Table 7. Panel Data Regression Results

Variable	Coefficient	t-Statistic	Prob.
C	0.842	2.114	0.037
ESG Disclosure	1.965	2.873	0.005
Corporate Governance	1.284	2.216	0.029
ESG × Corporate Governance	2.147	2.541	0.013
R-squared	0.641		

Adjusted R-squared	0.598
Prob(F-statistic)	0.0000

Source: Data processed (2026)

Based on the regression results presented in Table 7, the ESG disclosure variable has a coefficient value of 1.965 with a probability value of 0.005, which is lower than the significance level of 0.05. These findings indicate that ESG disclosure has a positive and significant effect on firm value in energy sector companies. This result suggests that higher levels of ESG disclosure are associated with higher firm value, as reflected in Tobin's Q.

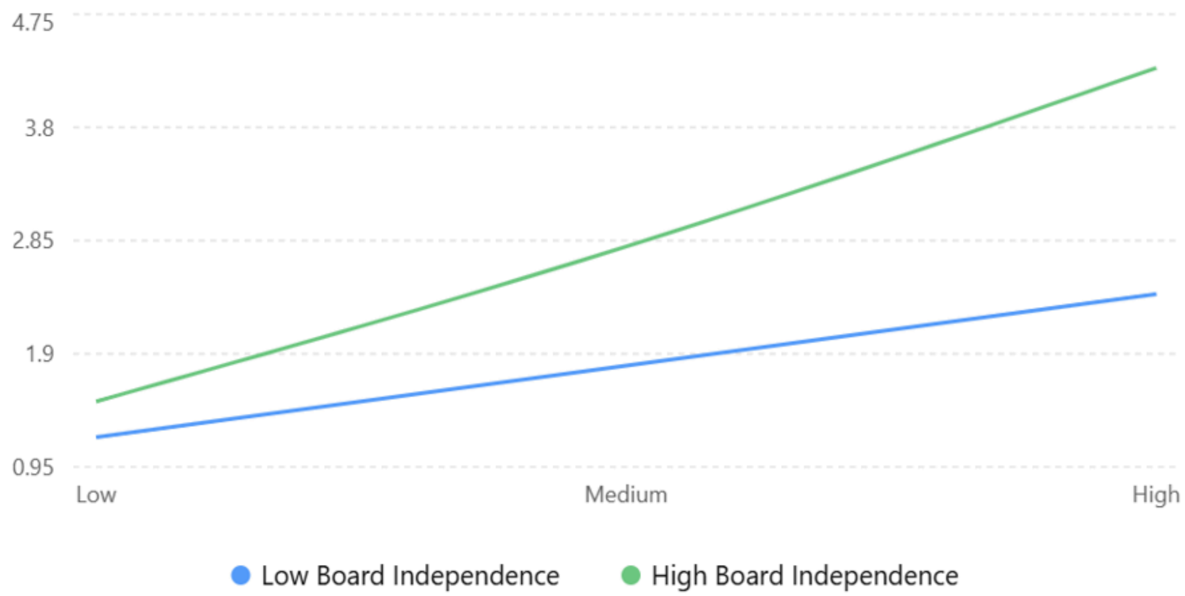
The findings indicate that investors have increasingly considered ESG information as an important component in evaluating corporate quality and future business prospects. Companies with higher quality ESG disclosure are generally perceived as having stronger capabilities in managing environmental risks, maintaining operational sustainability, and enhancing corporate reputation in the eyes of investors. Consequently, the market tends to respond more positively toward firms with better ESG disclosure practices.

This finding is consistent with signaling theory, which explains that ESG disclosure can function as a positive signal to investors regarding corporate quality and long term business sustainability prospects. The results of this study also support prior research conducted by Aydogmus et al., 2022; Qureshi et al., (2020) which found that ESG disclosure positively influences firm value. Board independence, proxied by the proportion of independent commissioners, also demonstrates a positive effect on firm value with a probability value of 0.029. This result indicates that companies with a stronger proportion of independent commissioners tend to receive more favorable market responses compared to firms with lower board independence.

The interaction variable between ESG disclosure and board independence produces a coefficient value of 2.147 with a probability value of 0.013, which is below the 0.05 significance threshold. This finding demonstrates that board independence strengthens the effect of ESG disclosure on firm value. In other words, ESG disclosure becomes more effective in enhancing firm value when supported by a stronger monitoring function through independent commissioners. Effective board independence enhances disclosure credibility and transparency, thereby increasing investor confidence in sustainability-related information disclosed by the company.

The findings of this study support agency theory, which explains that corporate governance functions as a monitoring mechanism to reduce conflicts of interest between management and shareholders. Strong governance practices improve the quality of corporate information disclosure, thereby encouraging more positive investor responses toward the company's ESG disclosure practices.

Figure 1. Moderating Effect of Board Independence on the Relationship Between ESG Disclosure and Firm Value



Source: Processed data (2026)

Figure 1 demonstrates that the positive relationship between ESG disclosure and firm value becomes stronger when the proportion of independent commissioners is higher. Companies characterized by stronger board independence exhibit a steeper positive slope, indicating that investors assign greater value to ESG disclosure when governance mechanisms enhance disclosure credibility.

The interaction plot also indicates that the increase in firm value associated with ESG disclosure is relatively limited when board independence is low. In contrast, firms characterized by higher board independence exhibit a substantially steeper slope, suggesting that investors respond more positively to ESG disclosure when stronger monitoring mechanisms are present. This pattern supports the argument that board independence enhances the credibility and value relevance of sustainability-related disclosures

4.2. Discussion

The results of this study demonstrate that ESG disclosure has a positive and significant effect on firm value in energy sector companies listed on the Indonesia Stock Exchange. These findings indicate that investors have increasingly incorporated ESG information into their assessment of corporate quality and long term business sustainability prospects. Broader ESG disclosure is perceived as reflecting the company's capability to manage environmental risks, maintain operational sustainability, and improve corporate transparency toward investors and other stakeholders. Firms with stronger ESG disclosure quality tend to receive more favorable market responses compared to companies with lower levels of ESG disclosure.

Within the energy sector, ESG implementation has become increasingly important because the industry is characterized by high environmental sensitivity arising from operational activities associated with carbon emissions, natural resource exploitation, and the transition toward sustainable energy systems. Investors tend to place greater attention on energy companies demonstrating sustainability commitment through ESG disclosure, as such firms are perceived to possess stronger capabilities in dealing with regulatory pressure and future environmental risks. ESG disclosure is no longer viewed merely as a form of regulatory compliance, but also as a strategic instrument for enhancing corporate reputation and maintaining investor confidence. The findings of this study support signaling theory, which explains that companies utilize ESG disclosure as a mechanism for conveying positive signals to the market regarding corporate quality and future sustainability prospects. ESG related information disclosed by firms can reduce information asymmetry between management and investors, thereby strengthening investor confidence in the company's future outlook.

While legitimacy theory may suggest that ESG disclosure is sometimes used as a symbolic mechanism to obtain social approval, the results of this study indicate that investors appear to respond more favorably when ESG disclosure is accompanied by stronger board independence. This finding suggests that the market places greater value on ESG disclosures perceived as credible rather than symbolic. Therefore, the evidence appears to be more consistent with signaling theory and agency theory than with a purely symbolic legitimacy perspective

The positive market response toward ESG disclosure in the energy sector may also be explained by the industry's exposure to environmental and regulatory risks. Energy companies face increasing pressure related to carbon emissions, environmental compliance, and the transition toward more sustainable energy systems. In this context, ESG disclosure provides investors with additional information regarding how firms manage sustainability-related risks that may affect future financial performance. Companies that disclose ESG information more comprehensively are often perceived as being better prepared to address long term environmental and regulatory challenges

The results are consistent with the study conducted by Aydogmus et al., (2022) reported a positive association between ESG related sustainability information and firm value and corporate profitability. Similarly, Mohammad & Wasiuzzaman, (2021) reported that ESG disclosure enhances firm performance and strengthens corporate competitive advantage. In addition Friske et al., (2022) found that voluntary sustainability reporting generates a positive impact on firm value through increased investor trust in the company. The findings of this study further reinforce the view that ESG implementation within energy sector companies carries greater relevance compared to many other industries. Energy companies are exposed to stronger pressures related to environmental sustainability and the global energy transition, causing investors to become more sensitive toward the quality of corporate ESG disclosure. As a result, firms operating in the energy sector are increasingly expected to demonstrate stronger sustainability commitments through transparent and credible ESG reporting practices. These findings are consistent with the study conducted by Dorothy & Endri, (2024) which reported that ESG disclosure in the energy sector can enhance firm value when supported by strong corporate financial conditions. Similarly, Makarim et al., (2024) found that ESG disclosure positively influences the value of energy sector companies in Indonesia.

In addition to ESG disclosure, the results of this study reveal that board independence, proxied by the proportion of independent commissioners, has a positive effect on firm value. This finding indicates that companies with stronger governance quality tend to gain higher levels of investor confidence compared to firms with weaker governance structures. The presence of independent commissioners is considered capable of strengthening the company's monitoring function, thereby reducing conflicts of interest between management and shareholders. The findings demonstrate that board independence strengthens the relationship between ESG disclosure and firm value. The moderating role of independent commissioners may be associated with their monitoring function in overseeing management decisions and disclosure practices. Investors may perceive ESG disclosures as more credible when sustainability related information is supported by effective governance mechanisms. This condition becomes particularly important in industries where concerns regarding symbolic ESG reporting or greenwashing may arise. The presence of independent commissioners may therefore reduce investor skepticism and strengthen confidence that ESG initiatives reflect substantive corporate commitments rather than merely compliance oriented disclosure practices

This result suggests that ESG disclosure becomes more effective in enhancing corporate value when supported by high quality governance practices. Strong corporate governance enables ESG initiatives to be implemented in a more transparent, consistent, and accountable manner, thereby improving the credibility of ESG information disclosed to investors. Weak governance structures may cause ESG disclosure to become merely symbolic or limited to fulfilling regulatory pressures without generating substantial economic value for the company.

The findings of this study support agency theory, which explains that corporate governance functions as a monitoring mechanism aimed at reducing managerial opportunistic behavior and improving the quality of corporate information disclosure. Investors tend to respond more positively toward companies characterized by strong ESG disclosure accompanied by sound corporate governance because such firms are perceived to have lower agency related risks. The results of this study are consistent with the findings of Fatemi et al., (2018) which demonstrated that ESG performance generates a stronger impact on firm value when supported by high quality disclosure practices.

The results also indicate that the market does not respond uniformly to ESG disclosure practices. This condition is reflected in the substantial variation in firm value among energy sector companies. Some investors still perceive ESG implementation as an additional corporate cost that may not necessarily provide immediate economic benefits in the short term. As a result, market responses toward ESG disclosure remain influenced by various other factors, including corporate profitability, industry conditions, operational risk exposure, and governance quality. This finding is also in line with the study conducted by Rohendi & Apriliawati, (2026) which reported that empirical findings regarding the relationship between ESG disclosure and firm value continue to demonstrate inconsistencies due to differences in corporate characteristics and variations in investor perceptions toward ESG implementation.

The findings of this study indicate that ESG disclosure and corporate governance are associated with higher firm value among energy sector companies in Indonesia. However, the results should be interpreted with caution because the research design is based on observational data and does not fully eliminate the possibility of reverse causality or the influence of other firm specific characteristics. Companies with stronger market performance may possess greater resources to invest in sustainability initiatives and ESG reporting practices. Therefore, the findings should be viewed as evidence of a significant association rather than definitive proof of a causal relationship

5. Conclusion

This study aims to analyze the effect of ESG disclosure on firm value with corporate governance serving as a moderating variable in energy sector companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The findings reveal that ESG disclosure has a positive and significant effect on firm value. These results indicate that investors have increasingly considered ESG disclosure as an important indicator in evaluating corporate quality and long term business sustainability prospects. Companies with higher levels of ESG disclosure are generally perceived as having stronger capabilities in managing environmental risks, enhancing corporate transparency, and maintaining operational sustainability, thereby receiving more favorable market responses

Board independence, proxied by the proportion of independent commissioners, is also proven to strengthen the relationship between ESG disclosure and firm value. This finding suggests that ESG disclosure becomes more effective in enhancing corporate value when supported by strong governance quality. Effective corporate governance enables ESG practices to be implemented in a more transparent, accountable, and credible manner, thereby increasing investor confidence in the non financial information disclosed by the company.

The findings of this study indicate that ESG disclosure and the strengthening of corporate governance represent important factors in improving the firm value of energy sector companies in Indonesia. Therefore, energy companies need to enhance the quality of ESG disclosure and reinforce governance practices as part of their strategic efforts to increase investor confidence and maintain corporate value within the capital market.

5.1. Theoretical and Practical Implications

From a theoretical perspective, this study contributes to the development of the literature on ESG disclosure, corporate governance, and firm value, particularly within the context of energy sector companies in Indonesia. The findings reinforce signaling theory, which explains that ESG disclosure can serve as a positive signal to investors regarding corporate quality and long-term business sustainability prospects. In addition, this study strengthens agency theory by demonstrating that corporate governance functions as a monitoring mechanism capable of enhancing the credibility of ESG disclosure and reducing conflicts of interest between management and shareholders. This research provides further understanding that the effectiveness of ESG disclosure in enhancing firm value is influenced by the quality of corporate governance.

From a practical perspective, the findings provide important implications for energy sector companies to improve the quality of ESG disclosure and strengthen corporate governance as part of their strategic efforts to enhance firm value. For investors, the results of this study may serve as a consideration in investment decision-making by taking into account the quality of ESG disclosure and corporate governance practices. Furthermore, this research also offers implications for regulators and capital market authorities regarding the importance of strengthening ESG implementation and corporate governance practices in supporting the sustainability of public companies in Indonesia.

For energy sector companies, the findings highlight the importance of improving the quality and credibility of ESG disclosure through enhanced climate risk reporting, emissions transparency, sustainability assurance, and clearly communicated transition strategies. For investors, ESG disclosure should not be evaluated solely based on disclosure volume, but also on the governance mechanisms that support disclosure credibility. For regulators, the findings emphasize the need to promote more standardized, comparable, and externally verified ESG reporting practices to strengthen transparency and investor confidence within the Indonesian capital market.

5.2. Limitations and Future Research

This study has several limitations that should be acknowledged. First, the research focuses solely on energy sector companies listed on the Indonesia Stock Exchange, meaning that the findings may not be fully generalizable to companies operating in other sectors. Second,

corporate governance in this study is measured only through the proportion of independent commissioners, which may not comprehensively represent the overall corporate governance mechanism. Third, the observation period is limited to 2020–2024, and therefore may not fully capture the long-term implementation and impact of ESG practices.
Another limitation of this study relates to the measurement of corporate governance, which is represented solely by the proportion of independent commissioners. Although this proxy captures an important monitoring mechanism, it may not fully reflect the broader dimensions of corporate governance. Future studies are encouraged to incorporate additional governance indicators, such as board size, audit committee characteristics, institutional ownership, managerial ownership, and board meeting frequency, to provide a more comprehensive assessment of governance quality.
Another limitation of this study concerns the use of Tobin's Q as the sole proxy for firm value and the absence of additional robustness analyses. Although Tobin's Q is widely used in capital market research, alternative measures may capture different aspects of market valuation. The study does not incorporate additional control variables such as firm size, leverage, profitability, and growth opportunities. The reported relationships should be interpreted with caution because firm-specific characteristics not included in the regression model may also influence firm value. The omission of these control variables may limit the ability of the model to fully isolate the effect of ESG disclosure and board independence on firm value. Future studies are encouraged to employ alternative firm value proxies, including Price to Book Value (PBV), and conduct additional robustness analyses to provide more comprehensive evidence regarding the relationship between ESG disclosure and firm value
Based on these limitations, future studies are recommended to expand the scope of research by including companies from various industrial sectors, incorporating additional corporate governance proxies such as institutional ownership, audit committee, and board size, and extending the observation period to obtain more comprehensive findings. Furthermore, future research may also consider the inclusion of other mediating or moderating variables, such as profitability, firm size, and green innovation, in order to provide deeper insights into the relationship between ESG disclosure and firm value among public companies in Indonesia. The study did not maintain a separate disclosure coding appendix for each ESG category. Future research is encouraged to provide a more detailed ESG coding framework to enhance replicability and transparency of the measurement process

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