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Do ESG Score and Cash Holding Drive Firm Value? Insights from Institutional Ownership in Indonesia

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ABSTRACT

This study examines the effect of ESG score and cash holding on firm value, as well as the moderating role of institutional ownership, using a sample of 91 energy companies listed on the Indonesia Stock Exchange (IDX) during 2021–2024. ESG performance is measured through content analysis based on 93 GRI disclosure indicators. At the same time, firm value is proxied by Tobin's Q. Using unbalanced panel data and Random Effects Model estimation, the findings reveal that ESG scores do not significantly influence firm value, indicating that the Indonesian capital market has not yet fully valued sustainability initiatives as a driver of corporate value. In contrast, cash holding demonstrates a strong positive effect, suggesting that liquidity remains a critical financial signal in the energy sector, which is characterized by high volatility and substantial investment needs. The moderating analyses show that institutional ownership does not strengthen the ESG value relationship and even weakens the positive impact of cash holding on firm value, reflecting the passive monitoring role of institutional investors in emerging markets. Overall, the study provides empirical evidence that firm value in Indonesia is more sensitive to financial fundamentals than sustainability practices, while external governance mechanisms remain limited in effectiveness. These insights contribute to the corporate governance and sustainable finance literature and offer practical implications for companies, investors, and regulators regarding the strategic integration of ESG and financial policies.

Keywords: Firm Value, ESG Score, Cash Holding, Institutional Ownership.

JEL Code: G32, G34, G15, Q56.

I. Introduction

Over the past two decades, the global business paradigm has shifted from a purely profit-oriented perspective toward sustainable practices that emphasize Environmental, Social, and Governance (ESG) dimensions. ESG has become a key instrument for investors and stakeholders in assessing a firm's long-term prospects and corporate responsibility (Chen et al., 2024; Mahmood et al., 2025). According Ahmed & Khalaf, (2025), strong ESG performance has been shown to enhance market value and reduce a firm's cost of capital.



Alongside sustainability, corporate financial policy, particularly cash holding plays a central role in firm value creation. Cash provides financial flexibility, reduces external financing dependence, and enables firms to respond to uncertainty. However, excessive cash may encourage managerial opportunism and reduce performance, creating a non-linear relationship between cash holding and firm value (Hewa et al., 2023). In emerging and high-risk environments, cash reserves also function as a strategic buffer against financial and geopolitical shocks (Alnori & Bugshan, 2025; Kumar & Symss, 2025; Magerakis, 2025)

ESG performance further enhances firm value by improving transparency, stakeholder trust, and access to capital (Mahmood et al., 2025; Mikolajek-Gocejna, 2024). Nevertheless, prior studies show that ESG impacts are more consistent in developed markets, while results in emerging economies remain mixed. (Lerskullawat & Ungphakorn, 2024; Yori & Rahmawati, 2025). Ahmed & Khalaf, (2025) also find that cash holding may amplify the value relevance of ESG by enabling firms to finance sustainability initiatives without constraining liquidity. The effectiveness of both ESG and cash holding is powerfully shaped by corporate governance, particularly institutional ownership. Institutional investors play a monitoring role that limits managerial opportunism, enhances transparency, and ensures that financial resources and ESG investments are used efficiently. (Hewa et al., 2023; Kumar & Symss, 2025; Magerakis, 2025). Taken together, ESG performance and cash holding can jointly enhance firm value when supported by strong institutional governance. Despite growing literature, empirical evidence on their interaction in emerging markets remains limited. Therefore, this study examines the effects of ESG score and cash holding on firm value, as well as the moderating role of institutional ownership, to provide insights into sustainable financial management in emerging economies.

II. Literature Review and Hypothesis Development

2.1. Agency Theory

Agency theory explains the conflict of interest between managers and shareholders that arises from the separation of ownership and control. (Jensen & Meckling, 1976). This theory is widely used to explain the relationships among ESG, institutional ownership, cash holding, and firm value. S. Wu et al., (2022) assert that ESG practices can reduce agency costs by enhancing managerial transparency and accountability toward shareholders. In addition, studies by Yilmaz, (2024) and Hewa et al., (2023) Use this theory to analyze how cash-holding policies may create agency problems when managers retain excess cash for their own personal interests. Research conducted in the UK, ASEAN-5, and Europe shows that ESG may, in some cases, reduce Tobin's Q due to high implementation costs or practices of "greenwashing" (Al-Tarawneh et al., 2024; Mikolajek-Gocejna, 2024; Yori & Rahmawati, 2025). In the context of this study, Agency Theory is relevant because it explains how ESG scores and cash holding can either enhance or reduce firm value depending on the effectiveness of existing monitoring mechanisms. ESG can mitigate agency conflicts by improving reputation and transparency, whereas excessive cash holding may increase the potential for managerial misuse of resources. The presence of institutional ownership as an influential shareholder serves as an external monitoring mechanism that can mitigate agency problems, thereby strengthening the positive effects of ESG and cash holding on firm value (Hassan et al., 2025; Shah et al., 2025).

2.2. Stakeholder Theory

Stakeholder theory emphasizes that firms are accountable not only to shareholders but also to all stakeholders who are affected by their activities (Freeman, 1984). Mahmood et al., (2025) and Espinosa-Méndez et al., (2023) find that firms with strong ESG performance gain greater public trust and experience enhanced long-term value. Similarly, (2025) asserts that integrating ESG creates both economic and social value by enhancing stakeholder legitimacy and trust. The ESG score also plays an important role as a signal to stakeholders that the firm is committed to sustainability. When a company receives a high score based on its disclosures, this is perceived as an indicator of credibility and accountability, thereby attracting the interest of

both institutional and retail investors (Vaihekoski & Yahya, 2025; Zhou et al., 2025). Research in France and the ASEAN-5 shows that stakeholder engagement through ESG has a positive impact on firm value, although the strength of this relationship is influenced by external factors such as ownership structure or governance quality (Gharbi & Jarboui, 2024; Lerskullawat & Ungphakorn, 2024). Within this framework, institutional ownership functions as a value transmission channel that ensures management genuinely implements ESG practices for the benefit of all stakeholders, rather than merely symbolically. This, in turn, strengthens the influence of ESG and the efficiency of cash management on firm value (Nguyen, 2025; Sun & Zhang, 2025).

2.3. Resource-Based View Theory

Resource-Based View (Barney, 1991) argues that long-term competitive advantage is achieved through the management of internal resources that are valuable, rare, and difficult to imitate. In prior research, this theory has been used to explain the role of ESG and cash as strategic resources that enhance competitiveness and firm value. Sun & Zhang, (2025) find that ESG contributes to high-value corporate innovation, while Yori & Rahmawati, (2025) and Nguyen, (2025) emphasize that strong ESG practices function as intangible assets that strengthen organizational capabilities. In the financial context, Yilmaz, (2024) also highlights that maintaining an optimal level of cash represents a form of strategic flexibility that supports a firm's ability to adapt to market uncertainty. Based on the RBV, the ESG score reflects a firm's ability to manage social and environmental resources to create sustainable competitive advantages, while cash holding serves as a financial resource that enables the firm to respond quickly to strategic opportunities. The combination of these factors strengthens the firm's competitive position in the market, particularly when monitored by institutional investors who ensure efficient resource allocation. Thus, this theory supports the view that ESG and cash are not merely operational policies but strategic assets that drive increases in firm value through effectiveness and sustainable advantage. (Espinosa-Méndez et al., 2023; Sun & Zhang, 2025).

2.4. Firm Value

Firm value is defined as the market's perception of the overall worth of a company, reflecting both its fundamental conditions and its future growth expectations. In this study, firm value is measured using Tobin's Q, which is the ratio of a firm's market value (market value of equity plus the book value of liabilities) to the book value of total assets. Tobin's Q is considered more representative than accounting-based measures such as ROA or ROE, as it captures market expectations regarding the firm's future performance. (Nguyen, 2025; Zhou et al., 2025). The use of Tobin's Q has been widely applied in ESG and cash-holding studies across countries, including China, Europe, and Southeast Asia, to measure the impact of sustainability practices on market valuation. (Wedajo et al., 2024; R. Wu et al., 2023). Cross-country studies show that firms with higher Tobin's Q tend to exhibit better ESG practices, though the relationship is not always linear, as it is moderated by factors such as governance quality and climate risk. (Singh & Kumar, 2025).

2.5. Environmental, Social, and Governance (ESG) Score

The Environmental, Social, and Governance (ESG) Score reflects a company's performance across the three main pillars of sustainability, environmental, social, and governance. Institutional investors widely use this score as a measure of non-financial risk and a firm's long-term sustainability potential (Mahmood et al., 2025). In this study, the ESG Score is derived from a content analysis based on the GRI index, which provides an annual risk-based assessment of sustainability-related factors. The measurement is conducted using both aggregate scores and pillar-specific scores (E, S, and G), with the addition of controversy scores as a robustness check (Kim & Koo, 2023; Sun & Zhang, 2025). A high ESG Score is associated with a lower cost of capital and higher market valuation, as demonstrated by studies conducted in Europe and Australia. (Vaihekoski & Yahya, 2025; Zhou et al., 2025). However, in emerging markets such as Indonesia and the ASEAN-5, the effect of the

ESG Score on firm value is sometimes negative or insignificant due to institutional limitations and the risk of greenwashing. (Lerskullawat & Ungphakorn, 2024; Yori & Rahmawati, 2025). Therefore, the use of the GRI index as a guideline for ESG content analysis in this study is relevant, as it has been widely applied in cross-country literature despite the mixed empirical results.

2.6. Cash Holding

Cash holding refers to the proportion of cash and cash equivalents maintained by a firm to finance operational activities, investment needs, and financial uncertainties. This variable is commonly measured using the ratio of cash to total assets or total current assets. (Hewa et al., 2023; Yilmaz, 2024). Previous studies have identified a non-linear, inverted-U-shaped relationship between cash holdings and firm performance, whereby insufficient cash increases liquidity risk, while excess cash generates agency costs due to the potential misuse of funds by management (J. Ahmed & Tahir, 2025; Hewa et al., 2023). In the context of firm value, cash holding functions as a strategic resource that enhances financial flexibility to support investment and sustainability initiatives; however, its effectiveness depends heavily on governance structures and monitoring mechanisms. Cross-country studies show that oversight by institutional shareholders and high-quality audits can mitigate agency conflicts, thereby strengthening the positive effect of cash holding on firm value (Farooq, Khan, et al., 2025; Hassan et al., 2025). Thus, in this study, cash holding is viewed as an important instrument that links managerial efficiency, institutional monitoring, and the enhancement of firm value.

2.7. Institutional Ownership

Institutional ownership is defined as the proportion of a firm's shares held by institutional investors, such as pension funds, insurance companies, mutual funds, and other financial institutions. This variable is important because it represents an external governance mechanism that helps reduce agency costs and curb managerial opportunistic behavior (Shah et al., 2025; S. Wu et al., 2022). In this study, institutional ownership is operationalized as the percentage of shares held by institutional investors relative to the total shares outstanding at the end of the fiscal year. Institutional investors are believed to play a more active monitoring role, ensuring that ESG activities and cash holding practices are genuinely oriented toward enhancing firm value. (Karim et al., 2023). Empirical research in China shows that institutional ownership can reduce the negative impact of mandatory CSR disclosure on firm value, while studies in the ASEAN-5 find that specific ownership concentration structures may weaken the influence of ESG on firm value (Lerskullawat & Ungphakorn, 2024). Thus, in this study, institutional ownership is positioned as a moderating variable that influences the direction and strength of the relationships between ESG, cash holding, and firm value. Overall, the three theories employed in this study provide a complementary foundation for explaining the relationships among ESG, cash holding, institutional ownership, and firm value. Agency Theory emphasizes that the benefits of ESG and cash can only be realized when effective monitoring mechanisms are in place to prevent managerial opportunism. Stakeholder Theory highlights how ESG and transparency in cash management enhance social legitimacy and stakeholder trust, which ultimately strengthen firm value. Meanwhile, the Resource-Based View considers ESG and cash holding as valuable, rare, and inimitable strategic resources that, when managed effectively, can create sustainable competitive advantage. Thus, taken together, these theories offer a comprehensive conceptual framework for understanding how ESG and cash holding may enhance firm value, as well as how institutional ownership serves as a moderating factor that facilitates value creation through monitoring functions, legitimacy building, and strategic resource management.

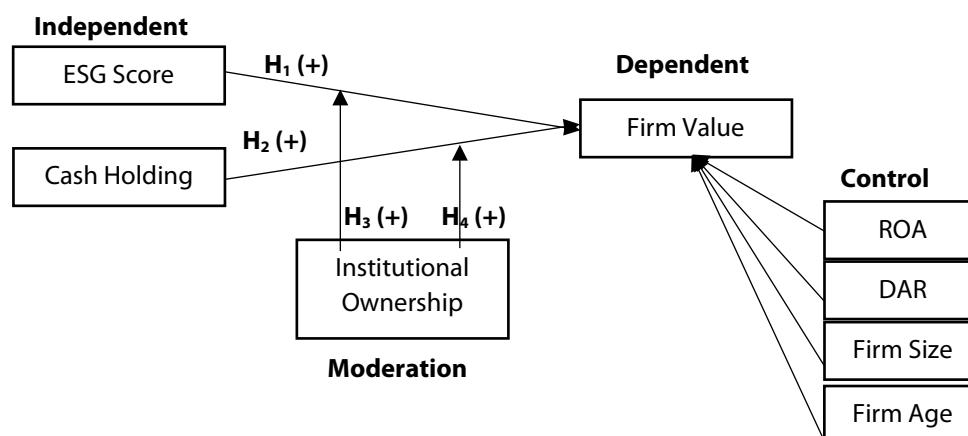


Figure 1. Conceptual Framework

2.8. The effect of ESG score on firm value

Stakeholder theory positions ESG as a credible signal of a firm's commitment to both institutional investors and the public (Vaihekoski & Yahya, 2025; Zhou et al., 2025). Within the RBV framework, ESG is viewed as a valuable and inimitable intangible resource that fosters sustainable competitive advantage (Espinosa-Méndez et al., 2023; Sun & Zhang, 2025). Therefore, ESG is not only an ethical instrument but also an economic strategy that strengthens the firm's position in the market. Meanwhile, from the perspective of Agency Theory, ESG practices help reduce agency costs by increasing transparency and monitoring managerial behavior (Farooq, Khan, et al., 2025; S. Wu et al., 2022). However, agency theory highlights the risks of over-investment and rating disagreement, which create opportunities for greenwashing, implying that the effect of ESG on firm value is highly dependent on governance controls (such as audit quality and board independence) and the credibility of score providers (Kim & Koo, 2023; Vaihekoski & Yahya, 2025). This theoretical framework aligns with the literature that links ESG to mechanisms of information asymmetry reduction and reputation building, while acknowledging institutional contingencies such as regulatory regimes and differences between emerging and developed markets. Empirically, nearly all cross-country studies show that ESG performance has a positive effect on firm value. Mahmood et al., (2025) and Zhou et al., (2025) report that ESG in Europe and Australia increases Tobin's Q and enhances corporate reputation. Similarly, Hassan et al., (2025) show that strong ESG disclosure consistently enhances firm value in France. These findings reinforce the assumption that investment in ESG creates synergistic economic and social value. Accordingly, the first hypothesis formulated in this study is:

H₁: ESG score has a positive effect on firm value

2.9. The effect of cash holding on firm value

According to Agency Theory, maintaining an optimal level of cash enables managers to meet liquidity needs without creating opportunities for fund misuse (Hewa et al., 2023). Within the framework of Stakeholder Theory, cash reserves reflect a firm's commitment to maintaining financial stability and protecting the interests of its stakeholders, particularly investors and creditors (Nguyen, 2025). Meanwhile, the RBV views cash as a strategic resource that enhances a firm's flexibility in seizing investment opportunities and navigating economic uncertainty (Yilmaz, 2024). Thus, efficient cash management becomes an indicator of managerial capability in creating long-term value. Empirical findings indicate a positive but non-linear relationship between cash holding and firm value. Hewa et al., (2023) demonstrating an inverted U-shaped relationship, in which optimal cash levels enhance performance, whereas excess cash reduces it. A similar result is reported by J. Ahmed & Tahir, (2025) who show that corporate governance strengthens the positive effect of cash on

firm value. In addition, (2024) finds that in the MENA region, cash serves as an important buffer against economic risk and positively affects firm value. Thus, efficient cash management significantly enhances firm value through effective governance and monitoring mechanisms. Accordingly, the second hypothesis formulated in this study is:

H₂: Cash holding has a positive effect on firm value

2.10. Institutional ownership moderates the relationship between ESG score and firm value

Based on Agency Theory, institutional investors act as a monitoring mechanism that reduces managerial opportunistic behavior in the implementation of ESG (Shah et al., 2025). From the perspective of Stakeholder Theory, institutional ownership strengthens stakeholder pressure for firms to genuinely implement substantive ESG practices rather than merely symbolic ones (Hassan et al., 2025). From the RBV perspective, institutional investors provide access to external resources and networks that enhance the effectiveness of ESG implementation as a source of competitive advantage (Espinosa-Méndez et al., 2023). Thus, it can be concluded that institutional ownership strengthens the positive relationship between ESG and firm value through monitoring mechanisms, social pressure, and resource support. Empirically, the findings of this study support this moderating role. S. Wu et al., (2022) find that institutional ownership strengthens the effect of ESG on firm value in China. Shah et al., (2025) also report that firms with institutional investors experience higher increases in value compared to firms without institutional monitoring. Similarly, Hassan et al., (2025) show that the combination of ESG score and institutional ownership significantly contributes to increasing firm value in France. These findings affirm that external monitoring by institutional investors strengthens the effectiveness of ESG in creating value. Accordingly, the third hypothesis formulated in this study is:

H₃: Institutional ownership strengthens the positive effect of ESG score on firm value

2.11. Institutional ownership moderates the relationship between cash holding and firm value

Within the framework of Agency Theory, institutional ownership constrains the potential opportunistic behavior of managers related to the use of excess cash (Hewa et al., 2023). Stakeholder Theory supports the view that institutional investors have an interest in ensuring that cash is used productively for the benefit of all stakeholders (Farooq, Nawaz Saleem, et al., 2025). Meanwhile, from the RBV perspective, institutional investors function as an external resource that strengthens the efficiency of cash management and the firm's investment strategy (J. Ahmed & Tahir, 2025). Thus, institutional monitoring ensures that corporate cash is not held passively but is utilized optimally to support value growth. Empirical research shows that institutional ownership strengthens the positive relationship between cash holding and firm value. Hewa et al., (2023) find that the positive effect of cash on performance is stronger in firms with high audit quality and high institutional ownership. Farooq, Khan, et al., (2025) also show that strong corporate governance strengthens the CSR-value relationship through the monitoring role of large shareholders. Similarly, J. Ahmed & Tahir, (2025) demonstrate that corporate governance, including institutional ownership, can enhance the efficiency of cash utilization and firm value. These findings underscore the strategic role of institutional ownership in optimizing the benefits of liquidity for increasing firm value. Accordingly, the fourth hypothesis formulated in this study is:

H₄: Institutional ownership strengthens the positive effect of cash holding on firm value

III. Research Method

3.1. Data and Sample

This study uses secondary data from 91 energy sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2021 to 2024, obtained from annual reports and sustainability reports. The energy sector is selected because it has high exposure to environmental and sustainability issues, as well as financial characteristics that require careful cash management due to energy price fluctuations and substantial investment needs. The period 2021 to 2024 is selected because it represents the post-pandemic period and the transition toward a green economy, during which regulatory pressure and ESG requirements increased significantly. The data used are in the form of an unbalanced panel, as not all firms have complete observations for every year; however, this structure still allows for a dynamic analysis of the effects of ESG score and cash holding on firm value. The analysis is conducted using Common Effect or Fixed Effect and/or Random Effect model, with the optimal model determined through the Chow Test, Hausman Test, and/or Lagrange Multiplier. This approach enables the researcher to empirically evaluate how the ESG score (based on the GRI index) and cash holding influence firm value (Tobin's Q), as well as how institutional ownership strengthens these relationships.

3.2. Dependent Variable

The firm value variable is measured using the Tobin's Q ratio, which is calculated as the market value of equity plus total debt divided by the company's total assets. This ratio reflects how the market evaluates a firm's performance and prospects relative to the book value of its assets. Tobin's Q is widely used because it captures investor perceptions of a firm's intrinsic value and the effectiveness of management in utilizing resources to create long-term value. This measurement is consistent with the studies S. Wu et al., (2022) in China, Mahmood et al., (2025) in Europe, and Zhou et al., (2025) in Australia, all of which employ Tobin's Q as the primary indicator of firm value in analyzing the relationships among ESG, ownership, and financial performance. These findings indicate that Tobin's Q is sensitive to governance, sustainability, and financial policy factors, making it a relevant metric for assessing the impact of ESG score and cash holding on firm value.

3.3. Independent Variable

The ESG score variable is measured using a content analysis based on the Global Reporting Initiative (GRI) Standards (consisting of 93 disclosure indicators), assigning a score of 1 if an indicator is disclosed and 0 if it is not, and then calculating the proportion as the firm's ESG score. This approach assesses the level of transparency and the company's commitment to environmental, social, and governance aspects. A similar method is used by Mahmood et al., (2025) in Europe, Yori & Rahmawati, (2025) in Indonesia, as well as Chen et al., (2024) and Lerskullawat & Ungphakorn, (2024) in other Asian countries, all of whom find that ESG disclosure based on the GRI index has a positive effect on firm value. Thus, the use of the GRI index is considered relevant for representing a company's sustainability performance in an objective and measurable manner. Cash holding is measured using the ratio of cash and cash equivalents to total assets, which reflects the proportion of a firm's liquidity available to support operational activities, investment needs, and financial uncertainty. This measure is widely used in financial studies because it is simple yet effective in capturing a firm's liquidity capacity and cash management policy. A similar approach is used by Hewa et al., (2023) in India, Yilmaz, (2024) in the MENA region, and J. Ahmed & Tahir, (2025) in Malaysia, who find that optimal cash levels have a positive effect on performance and firm value, whereas excess cash may generate agency costs. Therefore, the ratio of cash to total assets is chosen because it effectively captures the balance between liquidity, managerial efficiency, and value creation.

3.4. Moderation Variable

Institutional ownership is measured using the percentage of shares held by institutions such as pension funds, insurance companies, and investment managers relative to the total outstanding shares. This measure reflects the degree of external monitoring and market control over corporate management. Institutional investors generally possess stronger analytical capabilities and greater voting power than individual investors, making them important in reducing agency costs and improving the efficiency of managerial decision-making. This approach is adopted by S. Wu et al., (2022) in China and Shah et al., (2025), who find that institutional ownership strengthens the positive relationship between ESG disclosure and firm value. Farooq, Khan, et al., (2025) and J. Ahmed & Tahir, (2025) also show that monitoring by institutional investors enhances the efficiency of cash utilization and promotes better financial performance. Therefore, the percentage of institutional ownership is an appropriate measure for assessing the moderating role of institutional investors in the relationships among ESG, cash holding, and firm value.

Table 1. Variable Measurement

Variable	Symbol	Measurement	Sources
Firm value	FV	$Tobin's\ Q = \frac{MVE + BV\ Liabilities}{BV\ Total\ Assets}$	S. Wu et al., (2022)
ESG Score	ESG	$ESG = \frac{Total\ Discosure}{Total\ GRI\ Index\ (93\ items)}$	Mahmood et al., (2025)
Cash Holding	CH	$CH = \frac{Cash\ and\ Cash\ Equivalent}{Total\ Assets}$	J. Ahmed & Tahir, (2025)
Institutional Ownership	IO	$IO = \frac{Institutional\ Ownersip}{Total\ Ownership}$	Ngamtampong & Sukprasert, (2025)
Profitability	ROA	$ROA = \frac{Net\ Profit}{Total\ Assets} \times 100\%$	Maulana & Yuliana, (2025)
Leverage	DAR	$DAR = \frac{Total\ Debt}{Total\ Assets} \times 100\%$	S. Wu et al., (2022)
Firm Size	SIZE	Firm Size = L(N) Total/Assets	Mariska et al., (2025)
Firm Age	AGE	Firm Age = Year of research – Listed year at BEI	Chen et al., (2024)

3.5. Equation Model

The regression model in this study is estimated using unbalanced panel data because the number of observations for each firm varies across the study period. EViews is capable of handling unbalanced panels, allowing all available data to be utilized without reducing the accuracy of the estimations. The following model:

$$FV = \beta_0 + \beta_1 ESG_{it} + \beta_2 CH_{it} + \beta_3 ESG * IO_{it} + \beta_4 CH * IO_{it} + \beta_5 ROA_{it} + \beta_6 DAR_{it} + \beta_7 SIZE_{it} + \beta_8 AGE_{it} + \epsilon_{it}$$

illustrates the relationship between firm value (FV) and the variables ESG, CH, the interaction term involving IO as a moderating variable, and the control variables. The estimation is conducted using panel data methods (Common, Fixed, or Random Effects), with the optimal model selected based on the Chow, Hausman, and LM tests. This approach allows the model to capture differences in firm-specific characteristics even when the dataset is unbalanced.

IV. Results and Discussion

4.1. Result Analysis

This section presents the results of the empirical analysis based on data from 91 energy sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2021–2024. The period and sample

are selected due to the availability of sufficient data and their relevance to the research objectives. The resulting panel dataset is used to examine the effects of ESG score, cash holding, institutional ownership, and control variables on firm value.

4.2. Statistics Descriptive Result

Table 2. Statistics Descriptive Result

Variables	N	Mean	Maximum	Minimum	Standard Deviation
Firm Value	260	1.601	48.676	0.028	4.525
ESG Score	260	0.372	0.925	0.000	0.221
Cash Holding	260	0.141	0.809	0.001	0.134
Institutional Ownership	260	0.437	0.994	0.000	0.336
Return on Asset	260	0.068	0.603	-3.540	0.265
Debt to Asset Ratio	260	0.490	2.418	0.021	0.333
Firm Size	260	28.983	32.765	22.077	1.859
Fitm Age	260	11.973	34.000	-1.000	9.455

The sample consists of 260 firm-year observations. Firm value shows high dispersion (mean = 1.601; SD = 4.525), indicating substantial heterogeneity across firms. ESG performance is moderate (mean = 0.372), while cash holding averages 14.1% of total assets and institutional ownership 43.7%. Firms exhibit modest profitability (ROA = 6.8%) and moderate leverage (DAR = 0.490), with substantial variation in size and age. Overall, the wide dispersion across variables indicates firm cross-sectional heterogeneity, supporting the use of panel data regression.

4.3. Empirical Results

Before estimating the regression model, the researcher first determined the most appropriate panel model by conducting a series of tests, namely the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test.

Table 3. Chow Test

Effect Test	Probability
Chi-square	0.0000

The Chow test reports a probability value of 0.0000, rejecting the null hypothesis of a pooled ordinary least squares (Common Effects Model). This indicates the presence of significant individual (firm-specific) effects, implying that a panel data model is required and that the Fixed Effects Model is preferred over the Common Effects Model.

Table 4. Hausman Test

Test Summary	Probability
Cross-section Random	0.1761

The Hausman test yields a probability value of 0.1761, which is greater than the 5% significance level. This result fails to reject the null hypothesis that the Random Effects Model is consistent and efficient. Therefore, the REM is preferred over the FEM.

Table 5. Lagrange Multiplier (LM) Test

Test Hypothesis	Cross-section
Breusch-Pagan	0.0000

The Breusch–Pagan LM test produces a probability of 0.0000, rejecting the null hypothesis of no random effects. This confirms that the Random Effects Model is superior to the Common Effects Model. Chow and LM tests reject the Common Effects Model, while the Hausman test supports the use of the Random Effects Model over the Fixed Effects Model. Accordingly, the Random Effects Model (REM) is selected as the most appropriate specification for the panel regression. The results of these three tests consistently indicate that the Random Effect model is the most suitable for this study. Therefore, all subsequent analyses base their empirical interpretation on the estimation results of the Random Effect Model (REM).

Table 6. Coefficients of Determination Test (R²)

R-squared	0.355254
Adjusted R-squared	0.334704

The regression model yields an R² of 0.3552 and an adjusted R² of 0.3347, indicating that approximately 33–35% of the variation in firm value is explained by the model's variables.

Table 7. Probability (F-statistic) Test

F-statistic	17.28754
Probability (F-statistic)	0.000000

The Prob (F-statistic) value of 0.000000 further indicates that the model is statistically significant and appropriate for inferential analysis.

Table 8. T Test

Variables	Coefficient	Probability two-tailed	Probability one-tailed	Decision
Coefficient	11.67717	0.0581		
ESG	-0.995864	0.5696	0.2848	H ₁ rejected
CH	12.16524	0.0002	0.0001	H ₂ accepted
ESG*IO	2.045679	0.3688	0.1844	H ₃ rejected
CH*IO	-14.07558	0.0056	0.0028	H ₄ accepted
ROA	-9.196538	0.0000		
DAR	-1.145421	0.2466		
SIZE	-0.329107	0.1417		
AGE	-0.012367	0.7566		

Based on the REM estimation, the ESG variable does not have a significant effect on firm value (Tobin's Q), with a negative coefficient of -0.995864 and a probability value of 0.5696 (one-tailed), or 0.2848 (0.2848 > 0.05). This finding indicates that improvements in ESG performance have not been directly appreciated by the market, leading to the rejection of H₁. This outcome reflects the energy sector's strong focus on financial and production performance, as well as Indonesian investors' emphasis on short-term returns, which limits the market valuation of ESG activities. The finding that ESG does not have a significant effect on firm value contrasts with the majority of international studies such as Hassan et al., (2025), Mahmood et al., (2025), and Zhou et al., (2025) which document a positive ESG–value relationship in developed markets. However, this result is consistent with evidence from emerging markets, including studies by Lerskullawat & Ungphakorn,

(2024) and Yori & Rahmawati, (2025), show that weak disclosure quality, greenwashing risk, and governance shortcomings prevent ESG from being fully valued by the market, indicating that ESG has not yet functioned as a credible signal, strategic resource, or agency-cost-reducing mechanism in Indonesia's energy sector.

In contrast to ESG, the CH variable shows a positive and significant effect on firm value, with a coefficient of 12.16524 and a probability value of 0.0002 (one-tailed), or 0.0001 (two-tailed) ($0.0001 < 0.05$). This finding provides empirical support for H_2 ; therefore, H_2 is accepted. Higher liquidity signals stronger financial capacity to absorb industry volatility, finance investment, and mitigate risk, thereby increasing firm value. This result is consistent with J. Ahmed & Tahir, (2025), Hewa et al., (2023) and Yilmaz, (2024), who identify cash as both a liquidity buffer and a strategic resource. It also supports Agency Theory, as optimal cash holdings reduce agency risk and enhance managerial efficiency, and aligns with Stakeholder Theory and the Resource-Based View, which view liquidity as a foundation for long-term stability and competitiveness.

Furthermore, the moderating variable IO does not strengthen the relationship between ESG and firm value. The interaction term ESG*IO produces a positive coefficient of 2.045679 but is statistically insignificant ($p = 0.3688$), or one-tailed value of 0.1844 ($0.1844 > 0.05$), leading to the rejection of H_3 . This finding indicates that institutional investors do not enhance the market's response to firms' ESG performance. In Indonesia, institutional ownership remains passive mainly and does not prioritize ESG monitoring, particularly in the energy sector, limiting its role in linking ESG to firm value. As a result, institutional ownership fails to act as an effective governance mechanism, contrary to evidence from Hassan et al., (2025), Shah et al., (2025), and S. Wu et al., (2022). This pattern reflects the characteristics of emerging markets, where weak institutional monitoring prevents ESG from functioning as a credible signal, strategic resource, or agency-cost-reducing mechanism.

Meanwhile, the interaction term CH*IO shows a significant negative coefficient of -14.07558 ($p = 0.0056$), or one-tailed value of 0.0028 ($0.0028 < 0.05$). Interestingly, this result indicates that institutional ownership weakens, rather than strengthens the positive effect of cash holding on firm value, leading to the rejection of H_4 . This result can be explained by Agency Theory, which suggests that institutional investors may view high cash holdings as a signal of potential inefficiency or misallocation. As institutional ownership increases, monitoring pressure intensifies, leading the market to perceive a more cautious and less value-enhancing use of cash. This weakens the positive effect of cash holding on firm value, in contrast to J. Ahmed & Tahir, (2025) and Hewa et al., (2023). From a Stakeholder Theory and Resource-Based View perspective, cash remains a strategic resource, but its value depends on how governance pressures shape managerial discretion and investment behavior.

These results show that cash holding is a key driver of firm value in Indonesia's energy sector. At the same time, ESG has not yet become value-relevant, and institutional ownership fails to strengthen it and may even weaken its effects. The findings contribute to the corporate governance literature and provide practical guidance for financial and sustainability strategies in energy firms.

V. Conclusion

This study provides empirical evidence on the effects of ESG, cash holding, and institutional ownership on firm value in energy companies listed on the Indonesia Stock Exchange during 2021–2024. The results show that ESG scores do not significantly affect firm value, indicating that sustainability practices are not yet fully priced by the Indonesian capital market. In contrast, cash holding has a positive and significant effect on firm value, suggesting that liquidity remains a key signal for investors in the volatile energy sector. Institutional ownership does not strengthen the ESG–firm value relationship; somewhat, it weakens the positive impact of cash holding, suggesting that its monitoring role remains limited. Overall, firm value in this emerging market context is more responsive to financial strength than to sustainability disclosures. From a theoretical perspective, these findings indicate that the value relevance of ESG is context-dependent and influenced by governance quality and ownership structure. They support agency theory, which suggests that without adequate monitoring, ESG initiatives may become symbolic rather than value-enhancing. For practitioners, the results emphasize the importance of efficient cash management and the need for institutional investors to improve their oversight of both liquidity and sustainability investments. Regulators

may use these insights to strengthen ESG disclosure standards and assurance mechanisms. This study has several limitations. The GRI-based ESG measurement reflects disclosure quantity rather than quality, the sample is limited to the energy sector, institutional ownership is not disaggregated by investor type, and firm value is measured only by Tobin's Q. Future research should address these issues by incorporating alternative value measures, investor classifications, ESG assurance quality, and additional governance variables to explain firm value in emerging markets better.

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