Green Investment Policy as Moderator of ESG and Profitability on Value Relevance in Indonesian Coal Firm

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ABSTRACT

Growing sustainability awareness and regulatory pressure have encouraged coal companies to adopt ESG disclosure and green investment initiatives. However, empirical evidence on whether these practices enhance firm value remains inconclusive, particularly in emerging markets. Prior studies report inconsistent results regarding the value relevance of ESG disclosure and profitability, while the moderating role of Green Investment Policy (GIP) remains underexplored. Addressing this gap, this study examines the effect of ESG disclosure and profitability on the value relevance of accounting information, measured by Tobin's Q, and investigates GIP as a moderating variable. Panel data were obtained from coal companies listed on the Indonesia Stock Exchange during 2019–2024 and analyzed using moderated regression analysis with robust standard errors. The findings reveal that ESG disclosure does not significantly affect firm value, either directly or when moderated by GIP. In contrast, profitability moderated by GIP shows a positive and significant effect, indicating that the market values profits more highly when they are strategically allocated to green investments. This study contributes to accounting and sustainability literature by demonstrating that green investment policy strengthens the value relevance of profitability, highlighting the importance of integrating financial performance with substantive sustainability strategies in carbon-intensive industries.

***Keywords**: Accounting Information, ESG Disclosure, Moderated Regression Analysis, Green Investment Policy, Panel Data Regression, Value Relevance.*

ABSTRAK

Meningkatnya kesadaran keberlanjutan dan tekanan regulasi telah mendorong perusahaan batu bara untuk mengadopsi praktik pengungkapan ESG dan inisiatif investasi hijau. Namun, bukti empiris mengenai efektivitas praktik tersebut dalam meningkatkan nilai perusahaan masih belum konsisten, terutama di negara berkembang. Penelitian sebelumnya menunjukkan hasil yang beragam terkait relevansi nilai dari pengungkapan ESG dan profitabilitas, sementara peran moderasi dari kebijakan investasi hijau belum banyak diteliti. Untuk mengisi celah ini, penelitian ini menganalisis pengaruh pengungkapan ESG dan profitabilitas terhadap relevansi nilai informasi akuntansi, yang diukur menggunakan Tobin's Q, serta mengevaluasi kebijakan investasi hijau sebagai variabel moderasi. Data panel diperoleh dari perusahaan batu bara yang terdaftar di Bursa Efek Indonesia selama periode 2019–2024 dan dianalisis menggunakan regresi moderasi dengan standard error robust. Hasilnya menunjukkan bahwa pengungkapan ESG tidak berpengaruh signifikan terhadap nilai perusahaan, baik secara langsung maupun saat dimoderasi oleh kebijakan investasi hijau. Sebaliknya, profitabilitas yang dimoderasi oleh kebijakan investasi hijau menunjukkan pengaruh positif signifikan, menandakan bahwa laba yang dialokasikan secara strategis untuk investasi hijau lebih dihargai oleh pasar. Penelitian ini memperkaya literatur

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akuntansi dan keberlanjutan dengan menegaskan pentingnya integrasi antara kinerja keuangan dan strategi keberlanjutan yang substansial di industri padat karbon.

***Kata kunci**: Informasi Akuntansi, Pengungkapan ESG, Analisis Regresi Moderasi, Kebijakan Investasi Hijau, Regresi Data Panel, Relevansi Nilai.*

INTRODUCTION

Climate change has emerged as a serious threat to global economic stability, driving nations to adopt aggressive policies aimed at reducing carbon emissions and accelerating the transition toward a green economy (Acworth, 2017). The business sector is increasingly required to contribute through the disclosure of sustainability practices and the implementation of green investments. ESG disclosure has become a key instrument in communicating corporate environmental, social, and governance performance, as investors place growing attention on the value of sustainability. Within Spence's (1978) signaling theory and Francis and Schipper's (1999) value relevance theory, ESG information is positioned as a signal that influences market perceptions of a firm's intrinsic value.

As a developing country, Indonesia has demonstrated a strong commitment to sustainability through strategic policies such as the OJK Sustainable Finance Roadmap 2021–2025 and Presidential Regulation Number 98 (2021) on the carbon economy. These policies are reinforced by the mandatory sustainability reporting requirement under POJK Number 51/POJK.03/2017 and the IDX's initiatives to provide ESG risk assessments. Such initiatives reflect not only regulatory compliance but also corporate legitimacy in responding to external pressures (Kelman, 1958; Dowling & Pfeffer, 1975). In this context, ESG disclosure is no longer optional but has become a strategic necessity for maintaining competitiveness.

Profitability remains a primary indicator of a firm's fundamentals. However, findings in Indonesia's coal sector indicate that higher ESG disclosure does not always translate into improved market value. For example, PT Harum Energy Tbk recorded the highest Tobin's Q of 2.49 in 2021 but dropped sharply to 1.00 in 2023, despite increased ESG disclosure. This phenomenon raises concerns of greenwashing, where companies utilize ESG for image-building without genuine integration into operations (Yildirim, 2023). Such practices challenge the credibility of ESG as a relevant signal for investors in valuing firms.

The impact of profitability and ESG disclosure on the relevance and significance of accounting data is inconsistently demonstrated in prior research. Certain research by Mohammad and Wasiuzzaman (2021) and Aydoğmuş et al. (2022) indicates a favorable correlation, while Al-Tarawneh et al. (2024) and Zulaikha et al. (2025) report weak or negative associations. This contradiction highlights conceptual and empirical deficiencies, especially regarding emerging markets such as Indonesia, where regulatory dynamics and investor perceptions are distinctive. To address this gap, the present study introduces green investment policy as a moderating factor in the relationship between profitability, ESG disclosure, and the significance of accounting data in bridging this disparity. Such measures are currently executed via carbon trading mechanisms and the Indonesian Sustainable Finance Roadmap (Indonesia Carbon Trading Handbook, 2022). Limited research has examined their effectiveness in strengthening these relationships. This study enhances the literature by examining Indonesia's coal sector, which has the highest emissions contribution and faces mounting pressure in the energy transition.

This study advances prior research by introducing green investment policy as a moderating factor linking ESG disclosure, profitability, and value relevance, a relationship yet to be explored. Focusing on coal mining and related industries listed on the Indonesia Stock Exchange, it incorporates Moderated Regression Analysis (MRA) with panel data to provide robust, generalizable findings relevant to Indonesia's market and regulatory environment. Grounded in value relevance theory by Francis and Schipper

(1999), resource-based view by Barney (1991), compliance by Kelman, (1958), stakeholder by Freeman (1984), agency theory by Jensen and Meckling (2019), and legitimacy theories by Dowling and Pfeffer (1975), the study integrates these frameworks to strengthen signaling theory in explaining how ESG and green investment affect firm value, as reflected by Tobin's Q (Tobin, 1969). The findings provide theoretical and practical insights for developing credible sustainability reports, preventing greenwashing, and supporting regulators and investors in fostering sustainable, value-oriented business practices within Indonesia's capital market (Ramadhan et al., 2023).

This study is essential in addressing the challenges issuers face regarding transparency and sustainability. Growing global awareness of environmental and social issues has increased stakeholder expectations, while investors increasingly rely on ESG disclosure to assess risks and opportunities. Moreover, ESG disclosure and profitability influence the value relevance of accounting information, which shapes investment and valuation decisions. The role of government green investment policy is also critical, as it may affect corporate ESG practices. This study aims to examine the effect of ESG disclosure and profitability in relation to value relevance, with green investment policy as a moderating variable.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

The Effect of ESG Disclosure on Firm Value

Value Relevance Theory, as introduced by Beaver (1968), posits that accounting information, particularly earnings, affects stock trading volume and plays a crucial role in investor decision-making. This concept was further developed by Francis and Schipper (1999), who defined value relevance as the ability of accounting information to explain stock price changes or confirm investor expectations. Within this framework, net income, book value of equity, and cash flows are key indicators used to predict market prices (Ohlson, 1995). As non-financial disclosures have expanded, value relevance now includes ESG disclosure as an informational component that enhances investor trust and reduces information asymmetry (Mohammad & Wasiuzzaman, 2021). Accordingly, this study employs value relevance theory as the conceptual foundation to examine the effects of ESG disclosure and profitability on accounting information relevance, while assessing the moderating role of green investment policy.

ESG disclosure reflects a company's transparency in managing environmental, social, and governance issues, which investors increasingly consider in decision-making (Mohammad & Wasiuzzaman, 2021; Azkiya et al., 2024). It enhances market perceptions of firm value, especially in the energy sector (Dorothy & Endri, 2024). ESG consists of three pillars: environmental, covering climate mitigation and resource management; social, addressing human rights and community engagement, and governance, focusing on ethics, transparency, and board structure (Musa et al., 2024; Chehade & Procházka, 2024; Piao & Mei, 2025). In Indonesia, mandatory disclosure through POJK Number 51/POJK.03/2017 and SEOJK Number 16/SEOJK.04/2021, supported by the Sustainable Finance Roadmap II (2021–2025), has strengthened corporate sustainability reporting (OJK, 2021; Verina & Rohman, 2024).

Previous studies have explored the links between ESG disclosure, profitability, green investment, and the value relevance of accounting information, though often separately. Dorothy and Endri (2024) and Dinarjito (2025) found that ESG disclosure and profitability enhance firm value in the energy sector. Research by Aydoğmuş et al. (2022) and Baran et al. (2022) confirmed ESG's importance for financial performance, yet results differ across countries due to contextual and regulatory variations. Studies such as Swarly and Wibowo (2022) and Zhao et al. (2023) examined ESG's risk-reduction and governance roles but did not fully connect ESG to accounting information relevance. ESG disclosure signals management quality and transparency and correlates with higher Tobin's Q (Mohammad & Wasiuzzaman, 2021; Dorothy & Endri, 2024; Piao & Mei, 2025).

H1: ESG disclosure has a significant effect on firm value.

The Effect of Profitability on Firm Value

Signaling Theory, proposed by Spence (1978), assumes information asymmetry between firms and investors, motivating firms to convey credible signals through disclosure. ESG disclosure, profitability, and green investment policy function as strategic signals of managerial credibility, financial sustainability, and long-term environmental commitment. ESG disclosure signals environmental and social responsibility, profitability reflects operational efficiency, and green investment policy reinforces firms' positioning within the energy transition agenda (Hurduzeu et al., 2022). This study applies signaling theory to explain how these signals inform investors' assessment of value relevance and firm value in carbon-intensive industries such as Indonesia's coal sector.

Profitability is assessed using the Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) to total assets ratio, a reliable measure of operating efficiency excluding taxes, interest, and non-cash charges (IASB, 2018). It reflects how effectively assets generate income and serves as an indicator of financial health (Sufi, 2009). ESG practices have been found to enhance profitability through improved operational performance (Hurduzeu et al., 2022).

Previous studies have explored the links between ESG disclosure, profitability, green investment, and the value relevance of accounting information, though often separately. Savira and Arrozi (2022) emphasized profitability and capital structure as key determinants in the coal subsector. Dorothy and Endri (2024) and Dinarjito (2025) found that ESG disclosure and profitability enhance firm value in the energy sector. Profitability strengthens information reliability and investor confidence (Hurduzeu et al., 2022; Piao & Mei, 2025; Cristea et al., 2025).

H2: Profitability has a significant effect on firm value.

The Effect of Green Investment on Firm Value

This study is grounded in several key theories explaining the relationship between ESG disclosure, profitability, Green Investment Policy (GIP), and the value relevance of accounting information. Stakeholder Theory argues that firms are accountable not only to shareholders but also to broader stakeholders affected by corporate activities (Freeman, 1984). ESG disclosure reflects this responsibility by addressing sustainability expectations and improving disclosure quality, particularly in the energy sector (Porter & Van Der Linde, 2002; Hurduzeu et al., 2022). Agency Theory emphasizes that ESG reporting and GIP reduce agency conflicts and information asymmetry, thereby enhancing market trust and the credibility of financial information, especially in Indonesia's coal sector, where ESG functions as a governance mechanism (Zheng et al., 2015; Jensen & Meckling, 2019).

Legitimacy Theory explains how firms seek social acceptance by aligning disclosures with societal norms and regulatory pressures, with ESG and green investment reinforcing legitimacy amid rising institutional demands (Dowling & Pfeffer, 1975; Handayani & Rokhim, 2023). From the Resource-Based View, ESG and GIP constitute strategic, hard-to-imitate resources that support sustainable competitive advantage (Wernerfelt, 1984; Barney, 1991; Piao & Mei, 2025). Finally, Compliance Theory explains firms' motivations to adhere to sustainability regulations, ranging from external pressure to internalized values, with compliance evolving from reactive to strategic as sustainability becomes embedded in corporate operations (Kelman, 1958; Adhikara et al., 2022).

Integrating ESG disclosure, profitability, and green investment policy strengthens market perceptions of firm value, ESG builds credibility, profitability signals efficiency, and green investment reflects long-term sustainability (Mohammad & Wasiuzzaman, 2021; Handayani & Rokhim, 2023). Based on Value Relevance and Signaling Theory, this study posits that sustainability-linked accounting information enhances market value, with green investment acting as both moderator and predictor (Baron & Kenny, 1986;

Martínez-Ferrero et al., 2015). Meanwhile, green investment policy enhances legitimacy and competitive advantage (Barney, 1991; Purwaningrum & Adhikara, 2022; Musa et al., 2024; Bacchiocchi et al., 2024).

H3: Green investment policy has a significant effect on firm value.

Green Investment Policy as a Moderating Variable

Green Investment Policy refers to resource allocation toward projects supporting environmental sustainability, such as renewable energy and low-carbon technologies (Bacchiocchi et al., 2024). Rooted in green accounting principles that extend accounting systems to include environmental responsibilities, green investment is particularly urgent in Indonesia, given its Paris Agreement commitments and the launch of a domestic carbon market (Owen et al., 1997; Indonesia Carbon Trading Handbook, 2022). Beyond ecological impact, green investment also signals long-term corporate commitment to sustainability and contributes positively to efficiency and profitability (Cristea et al., 2025; Piao & Mei, 2025). Green investment is assessed using content analysis of sustainability reports based on indicators from the Indonesian Green Taxonomy and OJK Roadmap, producing an index score ranging from 0–100% (Krippendorff, 2018).

The credibility of ESG disclosure is often questioned if not supported by concrete implementation in the form of green investments. Green investment validates sustainability disclosures, reinforces market trust, and mitigates risks of "greenwashing." (Hasan & Al-Najjar, 2024). Under signaling theory, consistency between disclosure and action strengthens a firm's positive signal (Oza & Patekar, 2024). Cristea et al. (2025) found that only firms combining ESG disclosure with green investments achieved significant increases in firm value. Thus, green investment policy strengthens the relationship between ESG disclosure and the value relevance of accounting information.

High profitability provides a financial foundation for supporting sustainability agendas through green investment. Within the RBV framework, profits drive green investment strategies that enhance competitiveness and investor perceptions (Bacchiocchi et al., 2024). Piao and Mei (2025) found that the impact of profitability on firm value becomes more significant when combined with green investments. This combination signals both short-term efficiency and long-term sustainability.

H4: ESG disclosure has a significant effect on firm value moderated by green investment policy.
H5: Profitability has a significant effect on firm value moderated by green investment policy.

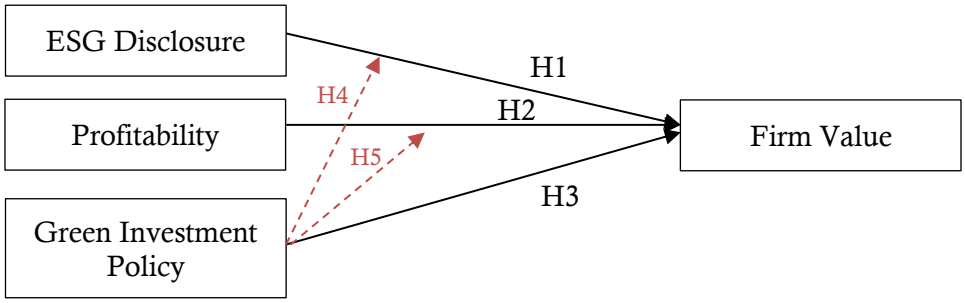

Figure 1. Research Framework

Based on Figure 1, the research framework posits that ESG disclosure and profitability enhance firm value, while green investment policy both directly increases firm value and strengthens these relationships. By acting as a moderating factor, green investment

amplifies the positive effects of transparency and financial performance on market valuation, illustrating how sustainability and profitability jointly drive firm value.

RESEARCH METHODS

This study adopts a quantitative approach with a causal-explanatory research design to examine the influence of ESG disclosure and profitability on the value relevance of accounting information, as well as the moderating role of green investment policy. The analytical model employed is a panel data regression using multiple linear regression and interaction analysis using Moderated Regression Analysis (MRA), with firms as the entities and years as the time dimension.

This study employs quantitative data derived from secondary sources, including annual reports, sustainability reports, and audited financial statements. Data were sourced from the official website of the Indonesian Stock Exchange and the corresponding corporate websites. The time horizon focuses on a time-series panel of coal sector companies. The collected data were processed into ESG scores, EBITDA values, green investment policy scores, and components required for calculating Tobin's Q.

This study used a saturation sampling strategy, utilizing the complete population that meets the requirements as the research sample. The population consists of all enterprises functioning within the energy industry and registered on the Indonesia Stock Exchange (IDX) from 2019 to 2024, amounting to 27 entities. The panel data methodology integrates cross-sectional data (among enterprises) with time-series data (across years). The regression panel models with moderation factors are delineated as follows:

Model 1: Direct Effects

$$TobinQit = \alpha + \beta1ESGit + \beta2PROFit + \beta3KIHit + \epsilon it$$

Model 2: Moderating Role of Green Investment Policy

$$TobinQit = \alpha + \beta1ESGit + \beta2PROFit + \beta3KIHit + \beta4(ESGit \times KIHit) + \beta5(PROFit \times KIHit) + \epsilon it$$

Where:
TobinQit = Firm value of firm i at year t, measured using Tobin's Q.
α = Intercept,
ESGit = ESG Disclosure, the first independent variable.
PROFit = Firm profitability, measured using the ratio of EBITDA to Total Assets.
GIPit = Green Investment Policy, functioning as both an independent variable and a moderator.
ESGit × GIPit = Interaction between ESG Disclosure and Green Investment Policy.
PROFit × GIPit = Interaction between Profitability and Green Investment Policy.
εit = Error term

Before estimating the panel regression model, classical assumption tests will be conducted, including tests for multicollinearity, heteroskedasticity, and autocorrelation. Multicollinearity will be tested using the Variance Inflation Factor (VIF), with expected values < 5. Heteroskedasticity will be tested using the Breusch-Pagan test, with a probability value > 0.05 indicating homoskedasticity. Autocorrelation will be tested using the Jochmans Portmanteau test, with a probability value > 0.05 indicating the absence of autocorrelation. The employed data analysis technique is panel data regression utilizing Moderated Regression Analysis (MRA). This method analyzes the influence of ESG Disclosure and Profitability on the Value Relevance of Accounting Information, the dependent variable. It examines the impact of the Green Investment Policy on the relationship among ESG Disclosure, Profitability, and Value Relevance through both direct and indirect mechanisms. All data processing will be conducted using STATA statistical software.

RESULTS

The descriptive statistical analysis in this study outlines the characteristics of 162 observations across the variables Tobin's Q, ESG disclosure, profitability, and Green Investment Policy (GIP). The purpose is to understand the distribution and detect potential outliers prior to advanced analysis.

Table 1. Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
Firm Value (TQ)	162	1.934831	2.760742	0.0530882	18.10736
ESG Disclosure (ESG)	162	0.5619202	0.4298655	0	1
Profitability (PROF)	162	0.1874945	0.1855583	-0.1377339	0.8269146
Green Investment Policy (GIP)	162	0.6337449	0.2914052	0	1

Based on Table 1, the average Tobin's Q of 1.93 indicates that coal sector firms are generally valued by the market above their book value. ESG disclosure with an average of 56.19%, reflecting moderate transparency, with variability that may enhance investor trust. Profitability, measured by EBITDA to total assets, shows an average of 18.75%, indicating a reasonably strong operational performance. Meanwhile, GIP records an average of 63.37%, signaling growing awareness among firms toward environmentally friendly investments. These findings suggest that despite the challenges of transitioning to sustainability, coal sector companies show positive signs of commitment to transparency and sustainable business strategies.

Table 2. Summary of Correlation

Correlation	R	p-value	Interpretation
Firm Value → ESG Disclosure	0.0583	0.4614	× Not significant, no correlation
Firm Value → Profitability	0.2013	0.0102	√ Weak but positive and significant
Firm Value → Green Investment Policy	0.0507	0.5216	× Not significant
ESG Disclosure → Profitability	0.3708	0.0000	√ Not significant and moderate
ESG Disclosure → Green Investment Policy	0.7999	0.0000	√√ Very strong correlation and significant
Profitability → Green Investment Policy	0.3407	0.0000	√ Significant and moderate

The findings of the correlation test in Table 2 indicate that ESG disclosure and GIP lack a statistically significant link with firm value, exhibiting correlation coefficients of 0.0583 (p = 0.4614) and 0.0507 (p = 0.5216), in that order. The profitability variable exhibits a positive and significant association with company value (r = 0.2013; p = 0.0102), however the correlation is minor. Conversely, the correlation among the independent variables exhibits a more robust link. ESG disclosure demonstrates a significant link with profitability (r = 0.3708; p = 0.0000) and a robust correlation with GIP (r = 0.7999; p = 0.0000), suggesting that firms with greater ESG transparency are inclined to adopt more robust green investment policies. Moreover, profitability and GIP exhibit a moderate and significant association (r = 0.3407; p = 0.0000).

Table 3. Classical Assumption Test

Type of Test	Statistic		Value
Multicollinearity Test	VIF	GIP	2.86
		ESG	2.79
		PROF	1.17
	1/VIF	GIP	0.349303
		ESG	0.357973
		PROF	0.857074
Heteroskedasticity Test	$chi^2(1)$		0.05
	Prob > chi^2		0.8171
Autocorrelation Test	Chi-sq(14)		14.056
	Prob > Chi-sq		0.4455

The multicollinearity test results in Table 3 reveal that all of the independent variables have VIF values below the critical threshold of 5. For example, GIP has a VIF of 2.86, ESG has a VIF of 2.79, and PROF has a VIF of 1.17. The average VIF is 2.27. This indicates the absence of serious multicollinearity issues, allowing the regression model to proceed without modification. Based on Table 3, the test findings indicate a Prob > chi² value of 0.8171 (> 0.05), signifying the acceptance of H_0 and the absence of evidence for heteroskedasticity in the model. Consequently, the regression model is considered suitable for continuation, since it meets the assumption of stable residual variance. The autocorrelation test using the Jochmans Portmanteau Test shows a Prob > Chi-sq value of 0.4455 (> 0.05). Thus, H_0 is accepted, may be concluded that the panel regression model exhibits no autocorrelation. This indicates that residuals across time within each observation unit are independent, meaning that the model meets the classical assumption and the regression estimates can be considered valid for further analysis.

The last phase in panel data regression analysis involves selecting the best appropriate panel data model to illustrate the interrelationships among variables. This selection aims to determine whether the characteristics of each company significantly affect the model. The model selection process involves two main tests: the Chow Test and the Hausman Test.

Table 4. Panel Data Model Selection

Test	Criteria	Rule Decision	Prob. Value	Result	Selected
Chow Test	Fixed Effect vs. Pooled OLS	If Prob > F < 0.05 → FEM	0.0019	H0 Rejected	Fixed Effect Model (FEM)
Hausman Test	Fixed Effect vs. Random Effect	If Prob > χ^2 > 0.05 → REM	0.5573	H_0 accepted	Random Effect Model (REM)

Based on Table 4, the panel data regression model selection begins with the Chow Test to determine whether the Fixed Effect Model is more appropriate than Pooled OLS. The results show a Prob > F value of 0.0000 (< 0.05), leading to the rejection of H_0 and the conclusion that the Fixed Effect Model is more suitable. This finding indicates significant differences in characteristics across companies that must be considered in the analysis. Therefore, the Fixed Effect Model is chosen to more accurately represent the relationship among ESG Disclosure, Profitability, Green Investment Policy, and firm value. The results of the Hausman Test indicate that H_0 is accepted with a Prob > chi² value of 0.5573 (> 0.05). This suggests that there is no discernible difference between the Fixed Effect Model's and the Random Effect Model's coefficients. As a result, the Random Effect Model (REM) is thought to be better suitable. The Hausman test indicates that the FE and RE coefficients do not differ systematically. Because the Random Effect Model (REM) is thought to be more effective without compromising consistency, this study uses it.

Table 5. Moderated Regression Analysis (MRA)

Variable	Coefficient	Std. error	z	P>|z|	[95% conf. interval]	
ESG Disclosure	0.0080429	1.059546	0.01	0.994	-2.068629	2.084715
Profitability	-5.139536	2.27416	-2.26	0.024	-9.596807	-0.6822644
Green Investment Policy	0.4282605	0.8506384	0.50	0.615	-1.23896	2.095481
ESG Disclosure_Green Investment Policy	0.0162421	1.419696	0.01	0.991	-2.766311	2.798795
Profitability_Green Investment Policy	7.866555	2.765459	2.84	0.004	2.446354	13.28676
_cons	1.536356	0.6728872	2.28	0.022	0.2175214	2.855191
R Squared Within	0.1657					
Prob > chi2	0.0001					

Based on Table 5, the Random Effect regression results show ESG disclosure does not substantially influence corporate value (coefficient = 0.0080; p = 0.994), indicating that the market may still regard it as mere administrative compliance. Profitability, however, demonstrates a significantly negative effect on firm value (coefficient = -5.1395; p = 0.024), suggesting that high profits without a sustainability strategy may be perceived negatively by the market, particularly in the coal sector. The Green Investment Policy (GIP) also shows no significant effect (coefficient = 0.4283; p = 0.615), suggesting that the market has not entirely acknowledged the worth of green investments in the conventional energy sector. The ESG × GIP interaction is not significant (p = 0.991), indicating that no strategic synergy has yet been appreciated by the market. However, the PROF × GIP interaction has a significantly positive effect (coefficient = 7.8665; p = 0.004), meaning that profitability is more highly valued by the market when accompanied by a commitment to green investment.

Table 6. Robust Standard Error

Variable	Coefficient	Robust Std. Err.	z	P>|z|	[95% conf. interval]	
ESG Disclosure	0.0080429	0.9950639	0.01	0.994	-1.942246	1.958332
Profitability	-5.139536	3.758139	-1.37	0.171	-12.50535	2.226281
Green Investment Policy	0.4282605	1.03045	0.42	0.678	-1.591383	2.447904
ESG Disclosure_Green Investment Policy	0.0162421	1.297997	0.01	0.990	-2.527786	2.56027
Profitability_Green Investment Policy	7.866555	4.772548	1.65	0.099	-1.487466	17.22058
_cons	1.536356	0.660229	2.33	0.020	0.242331	2.830381

A robust standard error test was performed to address potential violations of. To address potential heteroskedasticity and within-cluster correlations that may bias standard errors, this study applies robust standard errors to ensure accurate significance estimates in panel data analysis. As shown in Table 6, the corrected regression results indicate that ESG disclosure remains insignificant (coefficient = –0.0080; p = 0.994), suggesting that the coal sector market does not yet view ESG as a key determinant of firm value. Profitability shows a negative but insignificant relationship (coefficient = –5.1395; p = 0.171), implying that higher profits are not consistently perceived as added value, likely due to sustainability concerns. Green Investment Policy (GIP) also remains insignificant (coefficient = 0.4282; p = 0.678), indicating a limited market response to green initiatives. The ESG Disclosure × Green Investment Policy interaction is insignificant (coefficient = 0.0162; p = 0.990), showing no combined effect on firm value, while the Profitability × GIP interaction (coefficient = 7.8665; p = 0.099) suggests a potentially positive but statistically weak influence, indicating that profitability supported by green investment may enhance firm value with stronger empirical evidence.

The moderated regression analysis reveals that Green Investment Policy (GIP) strengthens the link between profitability and firm value but does not moderate the effect of ESG disclosure. Although significance levels declined after applying robust standard errors, the direction remained consistent, indicating that profitability combined with green commitment can enhance market value. However, the small GIP coefficient (0.428) suggests that green policies alone are not yet perceived as sufficient value drivers. Table 7 presents the comparison of hypotheses from the MRA and the Robust Test.

Table 7. Hypothesis Testing

Variable/ Interaction	Model	Coefficient (β)	P-value	Sig.	Accounting Interpretation
ESG disclosure→ Firm Value	MRA	0.0080429	0.994	Not Significant	ESG is not yet valued by the market, considered a cost, not a value creator.
	RSE	0.0080429	0.994	Not Significant	The effect remains negative; investors do not yet view ESG as a value signal.

Variable/ Interaction	Model	Coefficient (β)	P-value	Sig.	Accounting Interpretation
Profitability → Firm Value	MRA	-5.139536	0.024	Significant	High profitability statistically negatively impacts company value.
	RSE	-5.139536	0.171	Not Significant	The instability of the relationship indicates that profitability has not been interpreted by the market as a sustainability signal.
Green Investment Policy → Firm Value	MRA	0.4282605	0.615	Not Significant	GIP has not yet become a strategic market signal that supports company value.
	RSE	0.4282605	0.678	Not Significant	GIP has not consistently provided signals to the market.
ESG Disclosuree × Green Investment Policy → Firm Value	MRA	0.0162421	0.991	Not Significant	GIP has failed to moderate ESG; sustainability signals are poorly integrated.
	RSE	0.0162421	0.990	Not Significant	ESG and GIP synergies remain weak; they have not yet formed a strong accounting signal.
Profitability × Green Investment Policy → Firm Value	MRA	7.866555	0.004	Significant	GIP strengthens profits; sustainable profit signals are valued by the market.
	RSE	7.866555	0.099	Moderate, Significant	Statistically strong at the 10% level; the synergy between profit and GIP is increasingly recognized by the market.

DISCUSSION

The panel regression results show that ESG disclosure, profitability, and green investment policy jointly and significantly affect firm value (p = 0.0001), explaining 16.57% of its variation, while the rest is influenced by external factors such as market risk and ownership structure (Aydoğmuş et al., 2022). The moderate levels of ESG disclosure (56.2%) and profitability (18.7%) indicate compliance rather than strategic value signaling. However, when combined with GIP (average = 0.63), profitability becomes a stronger value driver. As a mandatory policy, green investment policy channels profits toward sustainability, reinforces investor trust, and mitigates agency conflicts (Oza & Patekar, 2024). Without such tangible commitments, ESG disclosure alone lacks value relevance (Cristea et al., 2025). Thus, firm value is primarily enhanced when profitability aligns with green investment, underscoring that financial and sustainability performance must be integrated to generate meaningful market value.

The test results show that ESG disclosure has no significant effect on firm value (Tobin's Q) with a coefficient of -0.008 and a p-value of 0.994, indicating that ESG is not yet a determinant of market value; thus, the hypothesis is rejected. The average ESG disclosure of 56.2% with a standard deviation of 0.4299 reflects inconsistent implementation across firms and the dominance of a compliance-oriented approach. These findings do not support Value Relevance Theory or Signaling Theory, as ESG has not yet become a credible strategic signal. Instead, they align more closely with Compliance Theory, which views ESG as a reporting obligation (Aydoğmuş et al., 2022; Baran et al., 2022). In this context, the effectiveness of ESG in creating market value depends heavily on consistent implementation and long-term strategic integration acknowledged by investors.

The regression results show that profitability significantly affects firm value (coefficient = -5.1395; p = 0.024), but the negative sign indicates that high profits send negative signals to investors due to unmet expectations. With an average profitability of 18.7%, the coal sector shows volatile margins, weakening the signaling effect when not linked to long-term sustainability. This suggests that profits alone lack value relevance and may even increase agency conflicts without strategic ESG alignment (Dorothy & Endri, 2024). Meanwhile, GIP has a positive but insignificant effect (coefficient = 0.428; p = 0.615), reflecting inconsistent implementation across firms. According to RBV and Stakeholder Theory, GIP has not yet become a structured strategic resource or a meaningful value signal for stakeholders (Bacchiocchi et al., 2024; Hasan & Al-Najjar, 2024).

The regression results show that the ESG × green investment policy interaction has no significant effect on firm value (coefficient = 0.0162; p = 0.991), indicating that GIP has not strengthened the influence of ESG disclosure due to weak integration of sustainability strategies. ESG disclosure remains largely compliance-based, and inconsistent green investment policy implementation fails to generate effective market signals, supporting Compliance Theory rather than Signaling Theory (Aydoğmuş et al., 2022; Oza & Patekar, 2024). In contrast, the Profitability × GIP interaction significantly enhances firm value (coefficient = 7.8666; p = 0.004), showing that profits directed toward green investments strengthen market valuation. This supports Signaling and Value Relevance Theories, as green-oriented profits convey credible long-term prospects, while under Agency Theory, such allocation reduces managerial-shareholder conflicts (Biju et al., 2025; Cristea et al., 2025).

These findings are consistent with Aydoğmuş et al. (2022) and Baran et al. (2022), who reported that ESG disclosure in emerging and carbon-intensive markets is often perceived as compliance-driven rather than value-enhancing. In contrast to studies conducted in developed markets where ESG functions as a strategic signal, this study highlights that in Indonesia's coal sector, ESG disclosure alone lacks credibility without tangible green investment (Cristea et al., 2025). This reinforces the argument that profitability contributes to firm value only when aligned with observable sustainability commitments, as reflected through Green Investment Policy.

CONCLUSION

This study concludes that ESG disclosure has not significantly influenced firm value, either directly or when moderated by the Green Investment Policy, indicating that ESG is not yet a strategic market signal in the coal sector. In contrast, profitability combined with GIP significantly affects market value, implying that investors value profits when directed toward sustainable investments. These findings highlight that integrating financial performance with sustainability orientation strengthens the value relevance of accounting information and long-term corporate valuation.

The findings contribute to Value Relevance Theory, showing that profitability gains market relevance only when aligned with credible sustainability actions. They also reinforce Resource-Based View and Signaling Theory, emphasizing that profitability and green investment integration create a competitive, hard-to-replicate advantage while enhancing investor trust in long-term prospects. Carbon-intensive companies should treat GIP as a strategic necessity, not merely a compliance tool. Aligning profitability with green investments strengthens market confidence and long-term firm value. For regulators, these results highlight the need to standardize ESG reporting and enhance green investment disclosure, supporting the transition toward IFRS S1 and S2 and the upcoming Indonesian Sustainability Disclosure Standards.

The research is limited by a small sample size, sectoral focus, and reliance on formal ESG reporting without evaluating implementation quality. GIP measurement remains narrow, and variations in reporting transparency may affect accuracy. The absence of non-linear or simultaneity analyses further constrains empirical robustness. Future research should expand sectoral coverage, use independent ESG data, and integrate qualitative methods, such as management interviews, to capture strategic depth. GIP indicators should also evolve into a comprehensive framework encompassing green capital expenditure, internal policy, and sustainability impact for a holistic understanding of value creation.

REFERENCES

[1] Acworth, W., Duan, M., Guigon, P., Haug, C., Kerr, S., Leining, C., Lubowski, R., Marijs, C., Matthes, F. C., Mehling, M. A., Murphy, L., Rittenhouse, K., Sammon, P., Wagner, G., & Ward, J.

(2017). *Emissions trading in practice: A handbook on design and implementation.* Washington, DC: World Bank Group.

[2] Adhikara, M. F. A., Maslichah, M., Diana, N., & Basyir, M. (2022). Taxpayer compliance determinants: perspective of theory of planned behavior and theory of attribution. *International Journal of Business and Applied Social Science*, *1*(2), 34–42.

[3] Al-Tarawneh, A., Tayeh, M., Iskandrani, M., & Obeidat, M. (2024). The impact of ESG scores on corporate financial performance: A study of non-financial firms listed in the UK. *Asian Economic and Financial Review*, *14*(11), 852–867.

[4] Aydoğmuş, M., Gülay, G., & Ergun, K. (2022a). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review*, *22*(1), 119–127.

[5] Azkiya, S. T., Azmi, I. N., & Kurniawan, R. (2024). The effect of environmental and social governance on company profitability levels. *Jurnal Ilmiah Manajemen Kesatuan*, *12*(5), 2045–2054.

[6] Bacchiocchi, A., Bellocchi, A., & Giombini, G. (2024). Green investment challenges in european firms: Internal vs. external resources. *Sustainability (Switzerland)*, *16*(2). 1-13.

[7] Baran, M., Kuźniarska, A., Makieła, Z. J., Sławik, A., & Stuss, M. M. (2022). Does ESG reporting relate to corporate financial performance in the context of the energy sector transformation? Evidence from Poland. *Energies*, *15*(2). 477-790.

[8] Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 24-36.

[9] Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

[10] Beaver, W. H. (1968). The information content of annual earnings announcements. *Empirical Research in Accounting: Selected Studies*, *6*(1), 12-25.

[11] Biju, A. V. N., Geetha, S., Prasad, S., Sasidharan, A., & Jayachandran, A. (2025). ESG-Firm performance nexus: Evidence from an emerging economy. *Business Strategy and the Environment*. *Business Strategy and the Environment*, *34*(3), 3469-3496.

[12] Chehade, S., & Procházka, D. (2024). Value relevance of accounting information in an emerging market: the case of IFRS adoption by non-financial listed firms in Saudi Arabia. *Journal of Accounting in Emerging Economies*, *14*(1), 220–246.

[13] Cristea, M., Noja, G. G., Drăcea, R. M., Iacobuţă-Mihăiţă, A. O., & Dorożyński, T. (2025). ESG investment strategies and the financial performance of european agricultural companies: A new modelling approach. *Journal of Business Economics and Management*, *25*(6), 1283–1307.

[14] Dinarjito, A. (2025). The influence of esg performance on firm value with cash holding as a moderating variable. *Jurnal Ilmiah Akuntansi Kesatuan*, *13*(3), 497-510.

[15] Dorothy, P., & Endri, E. (2024). Environmental, social and governance disclosure and firm value in the energy sector: The moderating role of profitability. *Problems and Perspectives in Management*, *22*(4), 588–599.

[16] Dowling, J., & Pfeffer, J. (1975). Legitimasi organisasi asosiasi sosiologi pasifik: nilai-nilai sosial dan perilaku organisasi. *The Pacific Sociological Review*, *18*(1), 32-43.

[17] Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research, 37*(2), 14-25.

[18] Freeman, R. E. (2020). The stakeholder approach revisited. In *Wirtschafts-und unternehmensethik* (pp. 657-671). Wiesbaden: Springer Fachmedien Wiesbaden.

[19] Handayani, A., & Rokhim, R. (2023). A comparative study of financial performance between sustainable and conventional investment. *Journal of Entrepreneurship & Business*, *4*(2), 114–124.

[20] Handayani, H., & Arrozi, M. F. (2023). Pengaruh net working capital, debt to equity ratio, total assets turn over, dan intellectual capital pada kinerja perusahaan. *SINOMIKA Journal*, *2*(3), 13-25.

[21] Hasan, F., & Al-Najjar, B. (2024). Green investment and dividend payouts: An intercontinental perspective. *Journal of Environmental Management*, *370*(1), 12-26.

[22] Hurduzeu, G., Noja, G. G., Cristea, M., Dracea, R. M., & Filip, R. I. (2022). Revisiting the impact of esg practices on firm financial performance in the energy sector: new empirical evidence. *Economic Computation and Economic Cybernetics Studies and Research*, *56*(4), 37–53.

[23] IASB. (2018). EBITDA (Earnings before interest, tax, depreciation and amortisation). *IASB*. Retrieved on 2 May, 2025 from https://www.ifrs.org/content/dam/ifrs/meetings/2018/november/iasb/ap21a-pfs.pdf

[24] Indonesia Carbon Trading Handbook. (2022). Indonesia Carbon Trading Handbook. *Katadata.com*. Retrieved on May 3, 2025, from https://databoks.katadata.co.id/publikasi/2022/08/23/indonesia-carbon-trading-handbook

[25] Jensen, M. C., & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. In *Corporate governance* (pp. 77–132). Wales: Gower.

[26] Kelman, H. C. (1958). Compliance, identification, and internalization three processes of attitude change. *Journal of conflict resolution*, *2*(1), 51-60.

[27] Krippendorff, K. (2018). *Content analysis: An introduction to its methodology*. New York: Sage Publications.

[28] Martínez-Ferrero, J., Garcia-Sanchez, I. M., & Cuadrado-Ballesteros, B. (2015). Effect of financial reporting quality on sustainability information disclosure. *Corporate Social Responsibility and Environmental Management*, *22*(1), 10-21.

[29] Mohammad, W. M. W., & Wasiuzzaman, S. (2021). Environmental, Social and Governance (ESG) disclosure, competitive advantage and performance of firms in Malaysia. *Cleaner Environmental Systems*, *2*(1), 203-215.

[30] Musa, H., Krištofik, P., Lysenko, Y., & Medzihorsky, J. (2024). Is there a connection between ESG scores and a company's profitability? Empirical evidence on selected Stoxx Europe 600 firms. *Investment Management and Financial Innovations*, *21*(3), 344–356.

[31] Ohlson, J. A. (1995). Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research*, *11*(2), 13-25.

[32] OJK. (2021). Roadmap Keungan Berkelanjutan Tahap II (2021 – 2025). *OJK*. Retrieved on May 2 2025 from https://ojk.go.id/id/berita-dan-kegiatan/publikasi/Pages/Roadmap-Keuangan-Berkelanjutan-Tahap-II-(2021-2025).aspx

[33] Owen, D., Gray, R., & Bebbington, J. (1997). Green accounting: Cosmetic irrelevance or radical agenda for change? *Asia-Pacific Journal of Accounting*, *4*(2), 175–198.

[34] Oza, P., & Patekar, A. (2024). Does environmental, social, and governance strategy lead to better firm performance: Analysis of NIFTY 500 companies. *Corporate Governance and Sustainability Review*, *8*(2), 24–36.

[35] Piao, X., & Mei, B. (2025). On the corporate performance of issuers of various green assets. *Finance Research Letters*, *78*(1), 23-35.

[36] Porter, M. E., & Van der Linde, C. (2002). Green and competitive: Ending the stalemate. *Journal of Business Administration and Policy Analysis*, *27*(1), 215-238.

[37] Purwaningrum, D., & Adhikara, M. A. (2022). Does the value relevance of accounting information mediate sustainability reporting disclosures: empirical evidence of Indonesian capital market. *International Journal of Management Studies and Social Science Research*, *4*(2), 1–13.

[38] Ramadhan, Y., Restuningsih, C., Haristi, A. N., Gaus, M., & Sulim, S. (2023). The role of accountants in climate change in the cement industry in Indonesia: Net zero emissions movement 2060. *Asian Journal of Social and Humanities*, *2*(3), 1-13.

[39] Savira, & Arrozi. (2022). Pengaruh return on investment, earning per share, dan debt to equity ratio terhadap price to book value. *Al Qalam: Jurnal Ilmiah Keagamaan dan Kemasyarakatan, 16*(2), 730-754.

[40] Spence, M. (1978). Job market signaling. In *Uncertainty in economics* (pp. 281-306). New York: Academic Press.

[41] Sufi, A. (2009). Bank lines of credit in corporate finance: An empirical analysis. *Review of Financial Studies*, *22*(3), 1057–1088.

[42] Swarly, R., & Wibowo, D. H. (2022). Pengaruh good corporate governance dan profitabilitas terhadap harga saham. *Jurnal Akuntansi Terapan*, *3*(2), 76-87.

[43] Tobin, J. (1969). A general equilibrium approach to monetary theory. *Journal of money, credit and banking*, *1*(1), 15-29.

[44] Verina, D. C., & Rohman, A. (2024). Pengaruh pengungkapan environmental, social, and governance (esg) terhadap kinerja bank pada masa sebelum dan selama pandemi Covid-19. *Diponegoro Journal of Accounting*, *13*(3), 45-56.

[45] Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, *5*(1), 1-13.

[46] Yildirim, S. (2023). Greenwashing: a rapid escape from sustainability or a slow transition? *LBS Journal of Management & Research*, *21*(1), 53–63.

[47] Zhao, Y., Elahi, E., Khalid, Z., Sun, X., & Sun, F. (2023). Environmental, social and governance performance: Analysis of CEO power and corporate risk. *Sustainability (Switzerland)*, *15*(2), 14-25.

[48] Zheng, X., Zhu, W., Zhao, H., & Zhang, C. (2015). Employee well-being in organizations: Theoretical model, scale development, and cross-cultural validation. *Journal of Organizational Behavior*, *36*(5), 621–644.

[49] Zulaikha, D., Halim, E. H., & Fitri. (2025). Pengaruh profitabilitas, likuiditas dan leverage terhadap nilai perusahaan pada perusahaan pertambangan batu bara yang terdaftar di Bursa Efek Indonesia tahun 2018-2023. *Universitas Riau*, *3*(1), 76-85.

The Effect of Green Investment Policy in Firm Value

2038