Model Exploration of Firm Value by means of Green Finance Disclosure in Companies List on Indonesia Stock Exchange

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Abstract. This study aims to examine and analyze the effect of green finance disclosure on firm value . There are 27 energy sector companies listed on the Indonesia Stock Exchange that have routinely submitted sustainability reports as a tangible manifestation of their commitment to implementing sustainable corporate management practices during 2022-2024. This study aims to examine and analyze the effect of green finance disclosure on firm value . Various previous studies have been conducted on this topic, but the results of these studies show that there is still an inconsistent research result between one study and another. The results of this study indicate that the final model selected is the REM (Random Effect Model). Environmental aspects has a negative and significant effect on firm value, Governance aspects has a positive and significant effect on firm value, while social and economic aspects does not have a significant effect on firm value.

Keywords: Firm Value, ESG, ESG disclosure

1 Introduction

The transformation to a low-carbon economy is driving fundamental changes in how companies particularly those in the energy sector finance their operations and investments. In Indonesia, this issue is increasingly relevant because the electricity generation mix is still dominated by coal (around 69% in 2023), placing the energy sector at the center of the national emissions reduction and energy transition agenda [1]. Accordingly, the Indonesian government, through its Enhanced Nationally Determined Contribution (Enhanced NDC), announced on September 23, 2022, emphasized increased emissions reduction targets, including through energy conservation and the promotion of clean/renewable energy [2]. This context places energy sector companies under dual pressure: maintaining profitability and business continuity while meeting the demands of decarbonization and sustainability accountability. Within the capital market framework, the response to these pressures is reflected in the increasing importance of sustainability information for investors. The Financial Services Authority (OJK) has regulated

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the implementation of sustainable finance for financial services institutions, issuers, and public companies through POJK No. 51/POJK.03/2017, which emphasizes the encouragement of sustainable finance implementation and sustainability reporting as part of governance and transparency [3]. In addition to OJK regulations, the Indonesia Stock Exchange (IDX) is also strengthening the sustainability reporting ecosystem through Sustainability Report channels and publications as well as initiatives to strengthen ESG reporting; even on January 22, 2025, IDX launched an ESG reporting update (ESG Metrics Reporting) as part of the issuer information disclosure system [4], [5]. Although the launch occurred after the observation period of this study, the policy dynamics indicate a market direction that increasingly demands measurability and comparability of ESG information. In this study, green finance disclosure is positioned as a strategic signal for companies in allocating resources and financing in line with sustainability principles. However, in empirical practice, green finance is often not available as a single, consistent monetary figure across issuers, thus requiring a standardized disclosure-based proxy. Therefore, this study operationalizes green finance disclosure through four main dimensions: environmental aspects social aspects ,governance aspects , and economic/profit aspects , with indicators guided by the Global Reporting Initiative (GRI). The selection of GRI is based on its position as a global best practice in reporting economic, environmental, and social impacts, as well as the availability of widely adopted standards [6]. In addition, the revised GRI Universal Standards (GRI 1, 2, 3) are effectively used for reporting starting January 1, 2023, making the 2022–2024 period an important phase to observe the adjustment of corporate disclosure practices to more recent standards [7]. Conceptually, the environmental dimension represents the depth of an energy company's commitment to reducing ecological impacts and transition risks; the social dimension captures the quality of the company's relationships with stakeholders (employees, communities, consumers) that influence operational legitimacy; the governance dimension ensures the credibility of green investment/financing decisions while mitigating the risk of greenwashing through oversight, accountability, and risk management. This study also adds an economic (profit) dimension specifically to the panel data regression model, as the GRI provides economic standards (GRI 200) that emphasize the creation and distribution of economic value and the financial implications of sustainability issues. Thus, green finance disclosure is not understood solely as a "compliance cost," but rather as a strategy that has the potential to influence market perceptions of cash flow prospects, risks, and business resilience.

2 Research Methodology

This research was conducted using secondary data obtained from the Indonesia Stock Exchange (IDX) through its official website (www.idx.co.id). The study employs a panel data approach covering a three-year observation period from 2022 to 2024. The population of this research consists of all energy sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period, in accordance with the IDX Industrial Classification (IDX-IC).The sampling technique applied in this study is purposive sampling, with the following criteria: 1) Energy sector companies that consistently published Sustainability Reports during the 2022–2024 period; 2) Energy sector companies that published complete annual financial statements for the 2022–2024 period; 3) Companies with accessible and complete disclosure data required to construct the research variables based on the Global Reporting Initiative (GRI) Standards. The type of data used in this study is secondary data, defined as data that have been previously

collected and published by other institutions prior to the execution of the research. Secondary data sources in this study include annual reports, sustainability reports, official publications from the Indonesia Stock Exchange, and publicly available corporate disclosures, which are commonly used in empirical capital market and sustainability research [8], [9]. The required data in this study include information on environmental, social, governance, and economic (profit) disclosures, measured using indicators derived from the GRI Standards, as well as firm-level financial and market data used to calculate firm value. The use of secondary data enhances data reliability and comparability across firms and periods, while also ensuring consistency with prior empirical studies in ESG and sustainable finance research . This study are the financial reports of companies listed on the Indonesia Stock Exchange (IDX) for 2022-2024, with the website www.idx.co.id. Calculations of environmental, social, governance, and economic aspects are based on GRI (Global Reporting Initiative) indicators.

3 Result And Discussion

The first step is to choose the most appropriate model (common effect, fixed effect, or random effect). The first step in selecting the appropriate model is to conduct a Chow Test, which aims to compare the common effect and random effect models. The results of the Chow Test can be seen in the Table 1.

Table 1. Result of Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	66.386454	(26,50)	0.0000
Cross-section Chi-square	289.179949	26	0.0000

Based on the table above, it can be seen that the P-Value (probability) of Chi_Square is smaller (<) than 0.05, meaning the selected model is the FEM model. Therefore, the next step is the Hausman Test which aims to choose the best model between the Fixed Effect Model (FEM) and the Random Effect Model (REM) in panel data analysis. The results of the Hausman test can be seen in the the Table 2.

Table 2. Result of Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.771540	4	0.2169

Based on the table above, it can be seen that the p-value (probability) is ≥ 0.05. This means that the selected model is the REM model. The next step is to conduct the Lagrange Multiplier (LM) test to determine the best panel data regression model (Common Effect Model (CEM) or Random Effect Model (REM). The results of the Lagrange Multiplier test in the Table 3:

Table 3. Result of Lagrange Multiplier Test

Effects Test	Statistic	d.f.	Prob.
Breusch-Pagan	63.82038	0.521468	64.34185
	(0.0000)	(0.4702)	(0.0000)
Honda	7.988766	-0.722127	5.138290
	(0.0000)	(0.7649)	(0.0000)
King-Wu	7.988766	-0.722127	1.439228
	(0.0000)	(0.7649)	(0.0750)
GHM	--	--	63.82038
	--	--	(0.0000)

Based on the results of the Lagrange Multiplier test, it was found that the probability value (P-value) of the Breusch-Pagan test was <0.05, meaning that the selected model was the REM (Random Effect Model). Thus, the data analysis model for this study was the REM model. In this study, classical assumption tests are not conducted because the selected estimation technique is the Random Effect Model (REM). The REM is estimated using the Generalized Least Squares (GLS) approach, which inherently accounts for potential heteroskedasticity and autocorrelation in panel data structures. Therefore, classical assumption tests that are typically required for Ordinary Least Squares (OLS) estimation are not a strict prerequisite for REM-based panel data analysis [10],[11]. The hypothesis testing can be seen in the Table 4:

Table 4. Hypothesis Testing Result

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	1.565650	0.436239	3.588969	0.0006
LING	-1.088466	0.476612	-2.283758	0.0252
SOS	0.854254	0.561271	1.521999	0.1322
GOV	0.844330	0.323260	2.611923	0.0108
EKO	-1.063673	0.584585	-1.819534	0.0728

Table 4 presents the results of the hypothesis testing based on the panel data regression model. At the 5% significance level, the regression results in Table 4 indicate that two variables have a statistically significant effect on firm value, namely the environmental aspect (LING) and the governance aspect (GOV). The environmental aspect (LING) shows a negative and statistically significant coefficient ($\beta = -1.088466$; $p = 0.0252 < 0.05$). This result suggests that environmental disclosure has a significant negative impact on firm value for energy sector companies during the study period. The finding may indicate that increased environmental initiatives and disclosures are perceived by the market as generating additional costs in the short term, which may reduce firm valuation. The governance aspect (GOV) has a positive and statistically significant effect on firm value ($\beta = 0.844330$; $p = 0.0108 < 0.05$). This implies that stronger governance practices enhance firm value, reflecting investor confidence in transparent decision-making, effective oversight, and reduced agency problems. In contrast, the social aspect (SOS) does not have a statistically significant effect on firm value at the 5% level ($\beta = 0.854254$; $p = 0.1322 > 0.05$). Similarly, the economic aspect (EKO) is not statistically significant at the 5% level ($\beta = -1.063673$; $p = 0.0728 > 0.05$). These results indicate that social and economic disclosures do not significantly influence firm value within the observed period when evaluated at the conventional 5% significance threshold.

Overall, at the 5% significance level, the findings suggest that environmental and governance disclosures play a more prominent role in explaining firm value, while social and

economic disclosures exhibit no significant impact in the Indonesian energy sector during 2022–2024. Model Estimation and Goodness-of-Fit Statistics can be seen in the Table 5:

Table 5. Model Estimation and Goodness-of-Fit Statistics

Weighted Statistics	
R-squared	0.115794
Adjusted R-squared	0.069257
S.E. of regression	0.421298
F-statistic	2.488202

The weighted statistics indicate that the regression model has an R-squared value of 0.1158, suggesting that approximately 11.6% of the variation in firm value is explained by the independent variables included in the model. The adjusted R-squared confirms that the explanatory power of the model remains relatively low after adjusting for the number of explanatory variables. The standard error of regression (0.4213) reflects the average deviation of the observed values from the estimated regression line, indicating a moderate level of dispersion. Furthermore, the F-statistic value of 2.4882 demonstrates the overall significance of the regression model, showing that the independent variables jointly contribute to explaining firm value.

Theoretically, environmental aspects reflect how a company manages issues related to energy consumption, emissions, waste, and other ecological impacts. Based on legitimacy theory, companies that demonstrate strong environmental responsibility are expected to gain greater stakeholder support, which may enhance long-term financial performance [11]. Firms are required to align their activities with prevailing social norms in order to maintain legitimacy and ensure their continuity within society [12]. However, the empirical results of this study indicate that environmental disclosure has a significant negative effect on firm value. This suggests that environmental initiatives may be perceived as an additional financial burden, particularly in the short term, due to substantial investment costs that are not immediately accompanied by increased profitability. As a result, investors may react negatively because the costs incurred in managing environmental aspects are not proportionate to the short-term returns. This finding is consistent with previous studies showing that environmental performance negatively affects firm value [13], [14].

According to signaling theory, companies use information disclosure, including social disclosure, as a signal of firm quality and managerial performance to investors. Transparent and comprehensive social disclosure is generally expected to send a positive signal, indicating that the company is well-managed and has sustainable growth potential. Nevertheless, the results of this study show that social aspects do not significantly affect firm value. This implies that investors do not place substantial weight on social disclosures when evaluating firm value, possibly because social impacts are difficult to measure and quantify accurately. The complexity and qualitative nature of social indicators may reduce their usefulness in investment decision-making. This result is in line with prior research finding that social disclosure has no significant effect on firm value [15].

Furthermore, the findings reveal that governance aspects have a positive and significant effect on firm value. Firms with strong governance structures tend to have effective systems, clear organizational frameworks, and robust oversight mechanisms, which enhance managerial efficiency and resource allocation. From the perspective of signaling theory, good corporate governance serves as a positive signal to investors, encouraging them to invest in and retain shares of the company. The stronger the governance practices, the higher the firm value. This result supports earlier empirical evidence showing that companies with strong governance

structures exhibit superior stock performance [16], and that firms in developing countries with better governance tend to have higher market valuation [17]

Finally, the economic aspect, as defined under the GRI 200 Economic Standards, reflects an organization's contribution to local and global economic conditions through value creation and distribution. The results of this study indicate that economic disclosure does not have a significant impact on firm value. This suggests that investors do not directly consider disclosures related to economic contributions to society and the broader economy when assessing firm value, focusing instead on other dimensions that are perceived to have more immediate financial implications.

Beyond the direct empirical findings, this study provides additional insight into the heterogeneous role of ESG-based green finance disclosure in emerging markets. The negative market response to environmental disclosure observed in this study suggests that investors in developing economies may still prioritize short-term financial performance over long-term environmental benefits. This phenomenon is consistent with recent evidence indicating that environmental investments often involve substantial upfront costs and delayed financial returns, which may weaken short-term firm valuation in carbon-intensive sectors [18]. Furthermore, the insignificant effect of social and economic disclosures implies that non-financial information related to social engagement and value distribution is not yet fully internalized by capital market participants. Prior studies highlight that in emerging markets, ESG information is often perceived as complementary rather than central in investment decision-making, particularly when disclosure quality and comparability are still evolving [19]. This reinforces the argument that the effectiveness of green finance disclosure depends not only on the extent of reporting but also on market maturity and investor awareness.

In contrast, the strong positive effect of governance disclosure underscores the role of governance as a credible signaling mechanism. Recent empirical research confirms that governance quality reduces information asymmetry, strengthens investor protection, and enhances firm value, especially in emerging markets where institutional environments are relatively weaker [20]. Thus, governance acts as a key channel through which green finance disclosure contributes to firm value.

Overall, these findings suggest that green finance disclosure should be interpreted as a multi-dimensional mechanism, where governance plays a dominant short-term valuation role, while environmental, social, and economic aspects may exert stronger effects over a longer investment horizon.

4 Conclusion

This study investigates the impact of green finance disclosure based on the GRI framework on firm value during the 2022–2024 period. The results indicate that environmental disclosure negatively affects firm value, while governance disclosure has a positive and significant effect. In contrast, social and economic disclosures do not significantly influence firm value. These findings suggest that the market values governance practices more strongly, whereas environmental and other sustainability-related disclosures may be perceived as short-term costs rather than immediate value drivers.

5 Suggestion

Companies should prioritize strengthening corporate governance to enhance firm value while communicating the long-term benefits of environmental initiatives more effectively to investors. Investors are encouraged to adopt a long-term perspective when evaluating sustainability disclosures. Future studies may extend the observation period or include additional moderating variables to further explore the relationship between green finance disclosure and firm value.

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References

[1] International Energy Agency (IEA): Indonesia – Energy mix (electricity generation). International Energy Agency (2023).
[2] United Nations Framework Convention on Climate Change (UNFCCC): Enhanced nationally determined contribution (NDC) Indonesia. UNFCCC (2022).
[3] Otoritas Jasa Keuangan (OJK): Peraturan OJK No. 51/POJK.03/2017 tentang penerapan keuangan berkelanjutan bagi lembaga jasa keuangan, emiten, dan perusahaan publik. Otoritas Jasa Keuangan (2017).
[4] Indonesia Stock Exchange (IDX): Sustainability report. Indonesia Stock Exchange (2026).
[5] Indonesia Stock Exchange (IDX): Indonesia Stock Exchange launched ESG metrics reporting. IDX Sustainability (2025).
[6] Global Reporting Initiative (GRI): GRI standards – Bahasa Indonesia translations. Global Reporting Initiative (2021).
[7] Global Reporting Initiative (GRI): Universal standards – Effective from 1 January 2023. Global Reporting Initiative (2021).
[8] Bursa Efek Indonesia (BEI): IDX industrial classification (IDX-IC). IDX Go Public (2025).
[9] Sekaran, U., and Bougie, R.: Research methods for business: A skill-building approach. 8th ed. John Wiley & Sons, Hoboken, NJ (2019).
[10] Baltagi, B. H.: Econometric analysis of panel data. 6th ed. Springer, Cham, Switzerland (2021).
[11] Hsiao, C.: Analysis of panel data. 4th ed. Cambridge University Press, Cambridge, UK (2022).

[12] Deegan, C.: Legitimacy theory. Accounting, Auditing & Accountability Journal, vol. 32, no. 8, pp. 2307–2329 (2019).
[13] Dominika, M. S., and Mildawati, T.: Pengaruh pengungkapan sustainability reporting terhadap nilai perusahaan. Jurnal Ilmu dan Riset Akuntansi (2022).
[14] Febrianti, N. P. A., Suryanawa, I. K., Mimba, N. P. S. H., and Ratnadi, N. M.: The effect of environmental, social, and governance (ESG) performance on firm value. International Journal of Economics, Management and Accounting, vol. 2, no. 3, pp. 261–274 (2025).
[15] Oktaviana, S., et al.: Analisis pengaruh environment, social, general disclosure, dan indikator keuangan terhadap nilai perusahaan. Jurnal Program Akuntansi Politeknik Ganesha, vol. 9, no. 1 (2025).
[16] Permata Sari, D., Fikri, M., Kartika, R., and Tanwattana, N.: Corporate governance, ESG disclosure, and firm value: Evidence from public companies in Indonesia. E-Commerce: Journal of Emerging Market Finance and Accounting, vol. 3, no. 2 (2025).
[17] Al-Shaer, H., Kuzey, C., Uyar, A., and Karaman, A.: Corporate strategy, board composition, and firm value. International Journal of Finance & Economics, vol. 29, no. 3, pp. 3177–3202 (2024).
[18] Broadstock, D. C., Chan, K., Cheng, L. T. W., and Wang, X.: The role of ESG performance during times of financial crisis: Evidence from COVID-19. Energy Economics, vol. 95, 105131 (2021).
[19] Atanasova, C., and Schwartz, E. S.: Climate change risk and the cost of capital. The Review of Financial Studies, vol. 32, no. 3, pp. 866–912 (2019).
[20] Nguyen, T. H., Nguyen, H. T., and Yin, X.: Corporate governance and firm value: Evidence from emerging markets. Journal of Asian Finance, Economics and Business, vol. 8, no. 2, pp. 761–772 (2021).