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The Effect of Environmental Disclosure and Green Innovation on Firm Value

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Abstract
This study aims to analyze the effect of environmental disclosure and green innovation on firm value. The research employs a quantitative approach using correlation analysis and panel data regression, assisted by EViews 12 software. The data consist of secondary data obtained from the annual financial reports of 20 companies listed on the Indonesia Stock Exchange during the 2020–2024 period, resulting in 100 observations. The empirical results indicate that environmental disclosure has a significant positive effect on firm value, while green innovation does not show a significant influence. These findings suggest that transparent environmental disclosure plays a crucial role in enhancing firm value by strengthening investor confidence. Practically, this study provides insights for investors in evaluating corporate sustainability performance and encourages companies to improve the quality of their environmental disclosures and green innovation strategies to support long-term sustainability and value creation.

Keywords:
Firm Value; Enviromental Disclosure; Green Innovation.

1. INTRODUCTION

An increase in firm value is commonly reflected in rising stock prices, which signal market confidence in a company's future performance and growth prospects. Firm value is closely linked to profitability, as both objectives aim to maximize shareholder wealth and ensure long-term corporate sustainability (Damas et al., 2021). From an investor's perspective, firm value represents the company's ability to efficiently utilize its resources, as indicated by its year-end stock price. Market value, or share price, is formed through the interaction of supply and demand in the capital market. Consequently, increasing share prices are often interpreted as an improvement in firm value. Therefore, optimizing firm value becomes a strategic priority for companies, as it supports the achievement of profit maximization and shareholder wealth enhancement (Indrawati et al., 2023).

In recent years, rising environmental awareness has intensified public and stakeholder expectations for companies to take greater responsibility for the environmental impacts of their operations. Governments, international organizations, and regulatory institutions increasingly emphasize corporate compliance with environmental regulations and sustainability policies. This growing pressure has expanded corporate accountability beyond shareholders and creditors to include a broader range of stakeholders. Within this context, environmental disclosure plays a crucial role as a communication mechanism through which companies voluntarily or mandatorily report their environmental performance, policies, and impacts. Companies with superior environmental performance tend to engage in more extensive environmental disclosure to maintain transparency and legitimacy in the eyes of investors and other stakeholders (Deswanto & Siregar, 2018). Empirical evidence suggests that environmental disclosure enhances firm value by strengthening stakeholder trust and signaling responsible corporate behavior, thereby generating a positive market response (Aboud & Diab, 2018).

Alongside environmental disclosure, companies are increasingly adopting green innovation as a proactive strategy to address environmental challenges. Unlike environmental disclosure, which focuses on information transparency, green innovation emphasizes the development and implementation of

environmentally friendly products, processes, and technologies. Green innovation aims to reduce environmental impact while simultaneously improving operational efficiency and competitive advantage. By adopting green innovation, companies can differentiate themselves from competitors, enhance corporate reputation, and attract environmentally conscious investors (Liu, 2024). Moreover, green innovation can reduce long-term compliance costs and mitigate environmental risks, thereby supporting firm value creation (Hardiyansah & Agustini, 2021). Several studies, such as Pan (2022), find that green innovation positively affects firm value, particularly in emerging markets like China. However, other research indicates that the impact of green innovation on firm value may be temporary or context-dependent (Xie et al., 2022).

Despite the growing body of literature examining environmental disclosure and green innovation, prior empirical findings remain inconsistent. Studies by Agustia et al. (2019), Yao et al. (2019), and Sumarno et al. (2023) report mixed results regarding the effect of environmental disclosure and green innovation on firm value, suggesting that their impacts may vary across institutional settings, time periods, and market conditions. These inconsistencies highlight a research gap, particularly in emerging markets such as Indonesia, where empirical evidence remains limited. Therefore, this study seeks to address this gap by simultaneously examining the effects of environmental disclosure and green innovation on firm value using recent panel data. By doing so, this research aims to provide clearer empirical insights and contribute to the ongoing debate on how corporate environmental strategies influence firm value.

1.1. Environmental Information Disclosure and Firm Value

Within the framework of legitimacy theory, every corporate action must be perceived and accepted by society as aligned with prevailing social values. In other words, corporate activities are considered legitimate when they align with societal expectations and norms. This perspective emphasizes that companies prioritize not only shareholder interests but also consider the interests of broader stakeholders. The extent of environmental information disclosure, commonly referred to as environmental disclosure, plays a crucial role in how investors evaluate investment opportunities. High-quality environmental disclosure often elicits a positive response from investors, which can ultimately contribute to increased corporate value (Saraswati et al. 2022). The Environmental Score represents a company's performance in managing environmental aspects such as emissions, resource utilization, and innovation. Higher levels of reported environmental performance are generally associated with increased corporate value. Strong environmental performance enhances a company's public image, contributes to revenue growth, lowers operating costs, and generates positive abnormal stock returns. These results serve as a favorable signal for investors, reflecting the company's commitment to sustainability and responsible business practices (Melinda & Wardhani, 2020). Research by Wu & Li (2023) shows that environmental practices have a positive and significant effect on increasing company value, with the environmental dimension consisting of three subcategories: resource use, emissions, and innovation. This study indicates that companies that effectively disclose environmental information have a positive influence on company value. H1: Environmental disclosure affects firm value.

1.2. Green Innovation and Firm Value

Environmentally sustainable production processes contribute to legitimacy by minimizing the use of technologies that generate recyclable waste and by implementing innovations aimed at recycling production waste to protect the environment. Stakeholder pressure encourages companies to develop environmentally friendly products, thereby ensuring legitimacy through the adoption of green innovations that mitigate environmental damage and address the concerns of various community groups whose quality of life may be affected. By advancing green innovation, companies can demonstrate to investors their commitment to environmental responsibility, enhance their corporate reputation, and generate economic benefits that offer promising prospects for investors (Li et al. 2020). Integrating green innovation into a company's business strategy fosters investor confidence by demonstrating the company's commitment to sustainability. Green innovation includes the development and utilization of environmentally friendly products characterized by low pollution levels, which align with stakeholder expectations. Research by Agustia et al. (2019) demonstrated that green innovation influences corporate value. The development of green innovation encourages companies to convert production waste into marketable products, thereby increasing corporate value. Eco-friendly products do not impact corporate value because products with eco-friendly elements tend to have high raw material costs, thus increasing selling prices. Green innovation provides companies with a significant source of competitive advantage, which will lead to increased firm value in the future (Zhang et al., 2020). H2: Green innovation impacts firm value.

Based on the background, objectives, problem formulation, and hypothesis development, the author proposes the following research model:

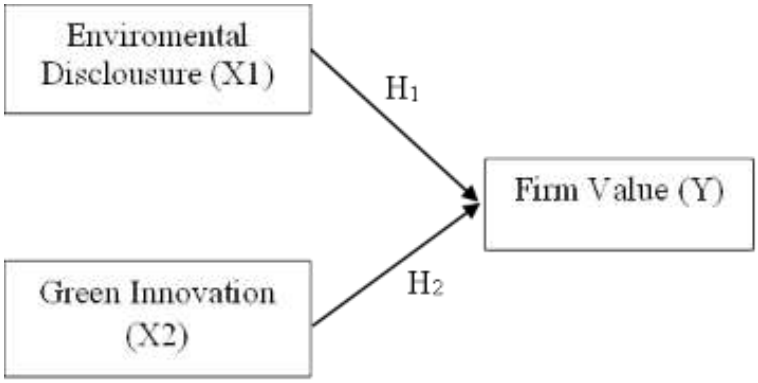

Figure 1. Reseacrh Model

2. RESEARCH METHOD

This study uses a quantitative method with regression analysis to explore the correlation and influence between variables. This study utilizes secondary data in the form of panel data, which combines time series and cross-sectional data. Secondary data comes from the financial reports of property and real estate companies for the years 2020-2024, obtained from the official website of the Indonesia Stock Exchange (IDX) at https://www.idx.co.id/id. Data collected over time from several entities are used in this study. Panel data refers to observations of several subjects over a specific period. Furthermore, this study employs a literature review approach by observing, studying, and directly quoting relevant journal articles and books, which serve as the theoretical foundation for this study. The total sample consists of 100 observations from 20 companies. The dependent variable in this study is firm value. Two independent variables are used: environmental disclosure (X1) and green innovation (X2). The data analysis method used in this study is panel data regression analyzed using EViews 12. The analysis stages include descriptive statistics, model feasibility test, paired correlation analysis, normality test, multicollinearity test, heteroscedasticity test, autocorrelation test, F test, T test, moderated regression analysis (MRA), and R-Square determination coefficient test (R^2).

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistical Analysis

In this study, descriptive statistics show the maximum, minimum, mean, and standard deviation values.

Table 1. Descriptive Statistical

	N	Minimum	Maximum	Mean	Std. Deviation
Firm Value	100	0.770000	18.3600	2.241100	3.008151
Environmental Disclosure	100	0.180000	86.9700	59.07440	19.07389
Green Innovation	100	0.142900	1.00000	0.711416	0.195776
Valid N (listwise)	100				

Source: Data Processed EViews 12

Based on Table 1, the company's value has a standard deviation of 3.008151 with a mean of 2.241100, a maximum of 18.3600, and a minimum of 0.77000. Environmental disclosure has a standard deviation of 19.07389 with a mean of 59.07440, and minimum and maximum values of 0.180000 and 86.9700, respectively. Green innovation has a standard deviation of 0.195776 with a mean of 0.728800, and minimum and maximum values of 0.142900 and 1.00000, respectively.

3.2. Regression Model Selection

3.2.1. Chow Test

The Chow Test is a panel data test used to determine the best model. If the probability value is < 0.05, the best estimate used is the fixed effect, and if the probability score is > 0.05, the best estimate used is the common effect.

Table 2. Result of The Chow-Test

Effects Test	Prob.
Cross-section F	0.0000
Cross-section Chi-square	0.0000

Source: Data Processed EViews 12

Table 2 shows the probability value for the Cross-Section Chi-Square of 0.0000. Based on the test criteria with a Prob. value of 0.0000 < 0.05, it can be concluded that in this model, it is better to use fixed effects because it has a probability value smaller than 0.05. Next, we continued with the Hausman test.

3.2.2. Hausman Test

In determining the model to be used in panel data regression, this test aims to compare the random effect model with the fixed effect model.

Tabel 3. Result of The Hausman Test

Test Summary	Prob.
Cross-section random	0.3473

Source: Data Processed EViews 12

Table 3 presents the results of the Hausman Test, with a probability value of 0.3743 > 0.05, which leads to the conclusion that a random effects model is used. However, because the Chow Test and the Hausman Test produce different model estimates, a Lagrange Multiplier test is necessary to determine which estimation model to use.

3.2.3. Lagrange Multiplier Test

The Lagrange Multiplier test aims to determine the best model between the random effect approach and the common effect approach that should be used in panel data modeling.

Table 4. Resul of The Lagrange Multiplier Test

	Cross-section
Breusch-Pagan	128.1862 (0.0000)

Sumber: Olah Data EViews 12

Based on Table 4, the LM test for the Common Effect Model with Random Effects yields a cross-section probability of 0.000, which is less than 0.05. Therefore, it can be concluded that the most suitable model for panel regression is the Random Effects Model.

3.2.4. Normality Test

The Normality Test is used to determine whether data is normally distributed or not. The criteria for the normal distribution test are if the Jarque-Bera value and probability > α (0.05), then the data is assumed to be normally distributed.

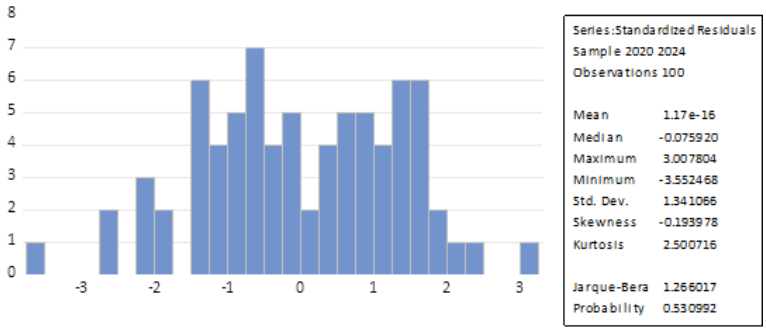

Figure 2. Normality Test. Source: Data Processed EViews 12

Based on Figure 2, the Jarque-Bera Probability value obtained is 1.266017, with a probability of 0.530992. The test results show that the Probability value is > α (0.05). Therefore, it can be concluded that the data is normally distributed, so the data is considered to meet the assumptions of normal distribution and is suitable for panel regression testing.

3.2.5. Multicollinearity Test

The multicollinearity test is used to examine the relationship between independent variables. The test criteria assume that multicollinearity does not occur if the centered VIF value is <10.

Table 5. Result of The Multicollinearity Test

Variable	Centered VIF
C	NA
Environmental Disclosure	1.261077
Green Innovation	1.226996

Source: Data Processed EViews 12

Based on Table 5, the results of the multicollinearity test show that the VIF value for environmental disclosure (X1) is 1.261077, and green innovation (X2) is 1.226996. All independent variables have values less than 10, indicating that the assumption of no multicollinearity is met in this study.

3.2.6. Heteroscedasticity Test

The heteroscedasticity test is used to assess the suitability of the regression model. This study uses the Glejser test with residuals as the dependent variable. If the significance value is greater than 5% (0.05), heteroscedasticity is not found.

Table 6. Heteroscedasticity Test Results

Variable	Prob.
C	0.4401
Environmental Disclosure	0.0541
Green Innovation	0.6366

Source: Data Processed Eviews 12

Based on Table 6, each variable, namely environmental disclosure (X1), obtained a probability value of 0.0541, and green innovation (X2) of 0.6366. These probability values indicate that all variables have values greater than the 0.05 significance level. It is possible that these data do not show signs of heteroscedasticity.

3.2.7. Autocorrelation Test

The autocorrelation test is used to determine whether there is a correlation between the observed data, meaning the appearance of one data point is influenced by other data points. This study used the Durbin-Watson test for autocorrelation, with the criterion that if dL < DW < 4-dU, there is no sign of autocorrelation.

Table 7. Result of The Autocorrelation Test

Durbin-Watson stat	1.962272

Source: Data Processed EViews 12

Based on Table 7, the Durbin-Watson value obtained is 1.615250, with dL = 1.6131, dU = 1.7364, and 4-dU = 2.2636. Using the test criteria, dL < DW < 4-dU is obtained, i.e., 1.6131 < 1.9622 < 2.2636. Thus, it can be concluded that the assumption of no autocorrelation is met in this study.

3.2.8. Panel Regression Test

The Panel Regression Test is used to analyze regression over a specific period. This analysis is used to determine environmental disclosure (X1) and green innovation (X2).

Table 8. Result of the Panel Regression Test

Dependent Variable: Firm_Value				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.927647	0.643225	-1.442182	0.1525
ED (X1)	-0.006167	0.001929	-3.197618	0.0019
GI (X2)	0.190045	0.191901	0.990327	0.3245

Source: Data Processed EViews 12

Formula is:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_4 M + e$

$FV = -0.9276 - 0.0061\ ED + 0.1900\ GI + e$

Based on the panel regression equation, it can be concluded that: The coefficient value for the dependent variable, firm value (Y), is -0.9276. This means that if environmental disclosure (X1) and green innovation (X2) are assumed to be zero, the firm value will be -0.9276. Environmental disclosure (X1) has a coefficient value of -0.0061, meaning that a 1% increase in environmental disclosure, assuming zero green innovation, will decrease firm value by -0.0061. Green innovation (X2) has a coefficient value of 0.1900, meaning a 1% increase in green innovation, assuming zero environmental disclosure, will increase firm value by 0.1900.

3.2.9. F Test

The F test, also known as the simultaneous test, is used to observe the collective influence of independent variables on the dependent variable. The F test criterion is that if the significance value is <0.05, then the independent variables simultaneously have a significant influence.

Tabel 9. Result of the F-Test

F-statistic	4.944466
Prob(F-statistic)	0.003096

Source: Data Processed EViews 12

Based on Table 9, the F-statistic value obtained is 4.944466, with a probability of 0.003096. The test criteria are F-statistic > F-table, i.e., 4.944466 > 3.091, and probability < alpha (5%), i.e., 0.003096 < 0.05. These results demonstrate that environmental disclosure (X1) and green innovation (X2) have a significant simultaneous effect on firm value in companies listed on the Indonesia Stock Exchange.

3.2.10. Coefficient of Determination (R2)

The Coefficient of Determination (R2) value is used to explain the contribution or influence of the independent variables on the dependent variable.

Table 10. Result of The Coefficient of Determination (R^2)

R-squared	0.133835
Adjusted R-squared	0.106767

Source: Data Processed EViews 12

Based on Table 10, the R-squared score is 0.133835. This means that the independent variables of environmental disclosure (X1) and green innovation (X2) contribute 13.38% to firm value (Y), while the remaining 86.62% is influenced by other variables outside this study.

3.3. Discussion

3.3.1. The Effect of Environmental Growth on Firm Value

Based on the data analysis, the probability value of environmental disclosure is 0.0019 (< 0.05), indicating that environmental disclosure has a significant positive effect on firm value. This finding is consistent with the study conducted by Abdi et al. (2022), which confirms that higher levels of environmental disclosure enhance firm value. Increased transparency regarding environmental performance improves investor perceptions of corporate responsibility and sustainability, which is subsequently reflected in higher stock prices.This result supports legitimacy theory, which posits that companies gain legitimacy by aligning their activities with societal norms and values. Through comprehensive environmental disclosure, firms communicate their commitment to environmental protection and sustainable development, thereby strengthening stakeholder trust and corporate reputation. Enhanced legitimacy encourages investor confidence, increases market demand for shares, and ultimately drives firm value upward. Moreover, effective environmental disclosure helps reduce reputational and regulatory risks while improving access to capital, particularly from environmentally conscious investors. Therefore, environmental disclosure not only provides short-term market benefits but also contributes to long-term corporate growth and sustainability (Li et al., 2018).

3.3.2. The Effect of Green Innovation on Company Value

Based on the data analysis, the probability value of green innovation is 0.3245 (> 0.05), indicating that green innovation does not have a significant effect on firm value. This finding aligns with the results of Husnaini and Tjahjadi (2021), who found that green innovation does not directly influence firm value. One possible explanation for this result is the high initial investment required to implement green innovation. The development of environmentally friendly products and processes often involves substantial capital expenditures for new technologies, equipment, and research and development activities. These costs may reduce short-term profitability and weaken immediate market responses.

In addition, the benefits of green innovation tend to be long-term and intangible, making them less visible to investors in the short run. Capital markets often prioritize short-term financial performance, such as earnings growth and cash flow, over long-term environmental benefits. As a result, green innovation initiatives may not be immediately reflected in higher stock prices, particularly when their economic returns are uncertain or difficult to measure. Sector-specific characteristics may also play a role, as not all industries experience the same level of market appreciation for green innovation due to differences in regulatory pressure, consumer awareness, and competitive dynamics.

From a theoretical perspective, these findings do not fully support legitimacy theory, which suggests that strong environmental commitments should enhance firm value through improved stakeholder perceptions. While green innovation reflects a proactive environmental strategy, its impact on firm value may

be delayed or mediated by other factors, such as environmental disclosure quality, market maturity, or institutional support. Thus, although green innovation demonstrates a company's commitment to sustainability, the high costs and delayed financial returns may limit its immediate contribution to firm value (Damas et al., 2021).

4. CONCLUSION

Based on the research findings and discussion, analyzing the influence of environmental disclosure and green innovation on firm value in Indonesian companies, the results indicate that environmental disclosure has a significant positive effect on firm value. Green innovation itself has no significant effect.
These findings support the notion of legitimacy theory, which suggests that companies can enhance their value and public trust by being transparent about their environmental performance and by adopting green innovation. Practically, this study suggests that companies should pay more attention to green practices and pollution control as part of their business operations to meet environmental expectations.

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