

The Effect of Green Investment and Green Strategy on Firm Value: Empirical Evidence from LQ45 Companies Listed on the Indonesia Stock Exchange (2020–2024)

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ABSTRACT

This study examines the effects of green investment and green strategy on firm value among companies included in the LQ45 index and listed on the Indonesia Stock Exchange. Using a quantitative approach and secondary data, this study analyzes the extent to which environmentally oriented corporate practices influence market valuation. The findings indicate that green strategy has a positive and statistically significant effect on firm value, suggesting that a clear and consistent environmental orientation can strengthen investor confidence and enhance corporate reputation. In contrast, green investment has a positive but statistically insignificant effect on firm value, suggesting that its benefits may take longer to materialize or may depend on more transparent disclosure practices to be recognized by the market. Overall, these findings highlight the importance of integrating strategic sustainability initiatives into corporate decision-making to support long-term value creation and improve market perceptions in the context of sustainable finance.

Keywords: Green Investment, Green Strategy, Firm Value, Sustainable Finance, LQ45 Companies.

I. Introduction

In the competitive business environment, firm value has become a crucial indicator of corporate success. It reflects investors' perceptions of a company's financial performance and future prospects and serves as an important basis for investment decision-making. A higher firm value generally indicates greater investor confidence in a company's ability to generate profits and deliver satisfactory returns. Brigham and Houston (2019) explain that firm value reflects investors' perceptions of a company's success in managing its resources, as indicated by its stock price. Firm value is influenced not only by financial conditions but also by various factors, including capital structure, dividend policy, profitability, corporate governance, and sustainability strategies. Therefore, increasing firm value is one of management's primary objectives, as it reflects the company's ability to create wealth for shareholders. Similarly, Keown et al. (2017) define firm value in terms of the market value of a company's total equity and debt, which reflects how the market evaluates the company. In recent years, firm values in the Indonesian capital market have experienced considerable

fluctuations. Global economic conditions, including inflation, rising interest rates, and geopolitical uncertainty, have influenced investor perceptions and market valuations. Furthermore, the COVID-19 pandemic significantly affected corporate performance and valuation across various sectors, particularly energy, transportation, and tourism. At the same time, the growing adoption of Environmental, Social, and Governance (ESG) principles and the increasing prominence of green investment have introduced additional considerations into firm valuation. Investors increasingly evaluate companies not only on the basis of profitability but also in terms of their social responsibility and environmental impact. Consequently, companies with strong sustainability practices and sound governance are often perceived more favorably by investors. In addition to external factors, internal factors such as profitability, measured by return on assets (ROA) and return on equity (ROE), leverage, dividend policy, and asset growth also play important roles in determining firm value.

Managers who allocate assets efficiently and maintain stable earnings can send positive signals to investors, potentially increasing stock prices and firm value. Alongside these financial considerations, environmental issues and climate change have become major global concerns over the past two decades. Rising carbon emissions, ecosystem degradation, and the extensive use of fossil fuels have intensified calls for more sustainable economic and investment systems. These developments have contributed to the emergence of green investment, which refers to the allocation of capital to environmentally friendly economic activities that support sustainable development. Globally, green investment has continued to gain momentum as countries strengthen their commitments to the Paris Agreement and pursue net-zero emissions targets by mid-century. The Global Sustainable Investment Alliance (GSIA) has reported substantial growth in global sustainable investment, reflecting increasing investor awareness of environmental and social risks associated with economic activities. Yusoff and Darus (2019) explain that companies undertake green investment to support environmentally friendly initiatives, including energy efficiency, waste management, and sustainable product innovation. These initiatives can improve corporate reputation and potentially enhance firm value by demonstrating a commitment to environmental responsibility. The growing adoption of green investment is also driven by changes in investor behavior, particularly the increasing consideration of ESG factors in investment decisions. Companies with strong ESG performance are often perceived as more sustainable, less exposed to certain risks, and better positioned to maintain stable long-term prospects. In Indonesia, many publicly listed companies have therefore begun improving the transparency of their sustainability reporting and incorporating environmental considerations into their business strategies to attract investors. Nevertheless, green investment still faces several challenges in Indonesia, including limited investor understanding of green financial instruments, insufficiently standardized measurement data, and a shortage of commercially viable green projects. These challenges highlight the need for further investigation into the development of green investment and its implications for the economy and corporate performance in Indonesia.

Bhatia and Tuli (2017) define green investment as the allocation of funds to assets, technologies, and infrastructure designed to reduce adverse environmental impacts while supporting long-term economic performance. However, the relationship between environmental responsibility and corporate practices requires careful examination, particularly when evaluating companies' broader business conduct. In its publication *Mine 2021: Great Expectations, Seizing Tomorrow*, PricewaterhouseCoopers (PwC) Indonesia reported that only 30% of 40 major mining companies had adopted transparent tax reporting practices in 2021 (Bisnis, 2021). Although this finding concerns tax transparency rather than green investment directly, it highlights broader concerns regarding corporate transparency and accountability in Indonesia. Frank et al. (2009) define tax aggressiveness as corporate efforts to manage taxable income to reduce tax liabilities through either legal tax avoidance or illegal tax evasion. Similarly, Laguir et al. (2015) explain that tax aggressiveness encompasses a spectrum of tax planning practices, ranging from legal arrangements to illegal activities. Such practices may involve earnings management and the strategic use of leverage. These issues underscore the importance of examining corporate conduct and accountability alongside financial performance and sustainability initiatives.

The effects of green strategy on firm value may vary depending on industry characteristics, market conditions, and the broader business environment. Financial performance, management quality, and external factors may also influence this relationship. Ashilah and Suryani (2021), in their study of LQ45 companies during the 2011–2014 period, found that integrated reporting and corporate diversification contributed to increased firm value. Green strategy may enhance firm value by strengthening competitive advantage, improving corporate reputation, increasing operational efficiency, and ensuring compliance with environmental regulations. Similarly, green investment may improve corporate reputation and firm value by demonstrating a commitment to sustainable business practices. Tanasya and Handayani (2020) found that green investment had a positive effect on profitability, supported by public responses, although its implementation required substantial expenditure. Effective communication between companies and investors, facilitated through investor relations (IR), may also influence firm value and investment performance. Investor relations functions to maintain transparent communication with investors, provide relevant corporate information, and strengthen investor confidence. These activities can help reduce information asymmetry and support informed investment decisions. This study focuses on companies included in the LQ45 index of the Indonesia Stock Exchange (IDX). According to Ismayanti (2014), the LQ45 index comprises companies characterized by high stock liquidity, substantial market capitalization, growth potential, and relatively strong financial performance. The IDX maintains the index, which consists of 45 stocks selected based on liquidity and other eligibility criteria, and reviews its constituents periodically to ensure continued relevance (Rachmawaty, 2018). Although LQ45 stocks are widely followed by investors, their performance is not always stable. For example, during the COVID-19 pandemic, LQ45 returns declined sharply, demonstrating that high liquidity does not eliminate the influence of internal and external risks on stock performance. Therefore, a comprehensive analysis of the factors affecting firm value is essential to help investors make informed investment decisions. In this context, this study examines the effects of green investment and green strategy on firm value among LQ45 companies listed on the Indonesia Stock Exchange during the 2020–2024 period.

II. Research Method

This study employs a quantitative research approach to examine the effects of green investment and green strategy on firm value among companies listed in the LQ45 index of the Indonesia Stock Exchange (IDX). This approach was selected because it enables hypotheses to be tested and relationships between variables to be measured systematically and objectively. It also facilitates the identification of statistical patterns and relationships among the variables under investigation. The study focuses on the 2020–2024 period, during which environmental, social, and governance (ESG) considerations became increasingly relevant to corporate performance evaluation. The population consists of companies listed in the LQ45 index during the observation period. The index was selected because it represents highly liquid stocks with substantial market capitalization in Indonesia, making it a relevant benchmark for examining investor perceptions and firm valuation. Companies included in the index provide a suitable context for investigating green investment and green strategy in relation to firm value, particularly in the context of growing attention to corporate governance, financial transparency, and environmental sustainability. This study uses purposive sampling, a sampling technique in which observations are selected according to specific criteria aligned with the research objectives. The sample selection criteria are as follows: (1) companies listed in the LQ45 index for at least three consecutive years during the observation period; (2) companies that publish annual reports or sustainability reports containing information on green investment or environmental initiatives; and (3) companies with complete financial statement data available through the IDX or their official websites. These criteria are intended to ensure that the selected companies provide relevant and sufficiently complete data for the analysis.

This study relies on secondary data obtained from publicly available sources, including annual reports, sustainability reports, and financial disclosures published by the selected companies. Additional

information was obtained from the official IDX website (www.idx.co.id) and other credible financial databases, where applicable. The use of secondary data enables the systematic examination of corporate disclosures and financial information while supporting consistency in the measurement of the research variables. The study examines three main variables: green investment, green strategy, and firm value. Green investment is measured using indicators related to environmentally oriented capital expenditure, energy efficiency projects, and sustainability-related investments disclosed in corporate reports. Green strategy refers to corporate policies and long-term initiatives aimed at achieving environmental sustainability, including resource efficiency programs, waste management practices, and carbon reduction targets. Firm value is measured using market-based indicators, such as the price-to-book value (PBV) ratio or Tobin's Q, which reflect market assessments of a company's value relative to its book equity or asset base, respectively. The data are analyzed using multiple linear regression to examine the effects of green investment and green strategy on firm value. Before conducting the regression analysis, classical assumption tests are performed to assess normality, multicollinearity, and heteroscedasticity. These diagnostic procedures help determine whether the regression model satisfies the relevant statistical assumptions. Statistical analyses may be conducted using software such as SPSS or EViews, depending on the software employed in the study. The regression model is specified as follows:

$$FV = \alpha + \beta_1 GI + \beta_2 GS + \varepsilon$$

Where:

- FV = Firm Value
- α = Constant
- β_1 = Regression coefficient of Green Investment
- GI = Green Investment
- β_2 = Regression coefficient of Green Strategy
- GS = Green Strategy
- ε = Error term

This model examines whether green investment and green strategy are associated with firm value, while estimating the individual effect of each independent variable, holding the other variable constant.

III. Result and Discussion

3.1. Descriptive Statistics

Table 1. Descriptive Statistics

Statistic	Y	X1	X2
Mean	1.641730	0.504719	0.328367
Median	2.154936	0.463262	0.311235
Maximum	5.940805	2.309394	0.740930
Minimum	0.032564	0.105625	0.013853
Std. Dev.	1.333558	0.394058	0.183729
Skewness	0.371632	3.132026	0.283417
Kurtosis	2.492246	14.69103	2.383122
Jarque-Bera	3.713680	806.2931	3.216760
Probability	0.156165	0.000000	0.200212
Sum	180.5903	55.51913	36.12038

Sum Sq. Dev.	193.8431	16.92569	3.679428
Observations	110	110	110

Table 1 presents the descriptive statistics for the research variables, namely firm value (Y), green investment (X1), and green strategy (X2). The results provide an overview of the distribution and variation of each variable during the observation period. The descriptive statistics are discussed as follows.

a. Firm Value (Y)

Firm value has a mean of 1.641730 and a standard deviation of 1.333558. Because the standard deviation is lower than the mean, the observations exhibit a degree of dispersion that is relatively small compared with the average value. The maximum value of 5.940805 was recorded by Indofood CBP Sukses Makmur Tbk in 2024, whereas the minimum value of 0.032564 was recorded by Sri Rejeki Isman Tbk in 2021.

b. Green Investment (X1)

Green investment has a mean of 0.504719 and a standard deviation of 0.394058. The standard deviation is lower than the mean, indicating that the observed values vary around the average, although the extent of this variation should be assessed in relation to the scale and operational measurement of the variable. The maximum value of 2.309394 was recorded by Millennium Pharmacon International Tbk in 2021, while the minimum value of 0.105625 was recorded by United Tractors Tbk in 2020.

c. Green Strategy (X2)

Green strategy has a mean of 0.328367 and a standard deviation of 0.183729. The standard deviation is lower than the mean, indicating that the dispersion of the observations is relatively small compared with the average value. The maximum value of 0.740930 was recorded by Perusahaan Gas Negara Tbk in 2022, whereas the minimum value of 0.013853 was recorded by Kalbe Farma Tbk in 2024.

3.2. Classical Assumption Tests

a. Normality Test

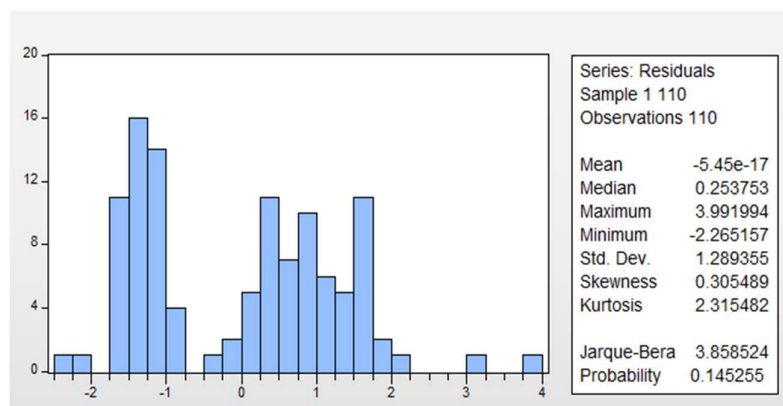


Figure 1. Normality Test Results

Based on the normality test results presented in Figure 1, the reported probability value is 0.145, which exceeds the 0.05 significance level. Therefore, the null hypothesis of normally distributed residuals cannot be rejected. This result suggests that the regression residuals do not significantly deviate from a normal distribution.

b. Multicollinearity Test

Table 2. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
X1	0.102242	2.713601	1.021854
X2	0.470323	4.315834	1.021854
C	0.081524	5.295273	NA

Table 2 presents the results of the multicollinearity test. The centered variance inflation factor (VIF) values for X1 and X2 are both 1.021854, which is below the commonly used threshold of 10. These results indicate that there is no evidence of problematic multicollinearity between the independent variables in the regression model.

c. Heteroscedasticity Test

Table 3. Heteroscedasticity Test Results

Statistic	Value	Probability
F-statistic	0.512799	0.6003
Obs*R-squared	1.044342	0.5932
Scaled explained SS	0.595195	0.7426

Table 3 presents the results of the heteroscedasticity test. The probability value associated with Obs*R-squared is 0.5932, which exceeds the 0.05 significance level. Accordingly, the null hypothesis of homoscedasticity cannot be rejected. This finding suggests that there is insufficient statistical evidence of heteroscedasticity in the regression model.

d. Coefficient of Determination

Table 4. Coefficient of Determination Test Results

Statistic	Value
R-squared	0.035194
Adjusted R-squared	0.077421

The coefficient of determination is used to assess the extent to which green investment and green strategy explain variations in firm value. However, the values reported in Table 4 require verification because the adjusted R-squared value is higher than the R-squared value. In a conventional ordinary least squares regression model with an intercept, the adjusted R-squared should not exceed the R-squared. Therefore, the explanatory power of the model cannot be interpreted reliably until the reported statistics have been checked against the original regression output.

3.3. F-Test (Simultaneous Test)

Table 5. F-Test Results

Statistic	Value
F-statistic	3.731155
Prob(F-statistic)	0.027139

Table 5 presents the results of the F-test, which evaluates whether green investment and green strategy jointly have a statistically significant relationship with firm value. The probability value of 0.027139 is

below the 0.05 significance level. Therefore, the null hypothesis that the coefficients of both independent variables are jointly equal to zero is rejected. This result indicates that green investment and green strategy jointly have a statistically significant effect on firm value. Accordingly, Hypothesis 3 (H3) is supported, provided that H3 specifies a simultaneous effect of the two independent variables on firm value.

3.4. Multiple Linear Regression Analysis

Table 6. Multiple Linear Regression Results

Variable	Coefficient	Std. Error	t-Statistic
X1 (Green Investment)	1.405409	0.319753	2.267880
X2 (Green Strategy)	1.514409	0.685801	2.208234
C (Constant)	0.939830	0.285523	3.291602

Based on the regression coefficients reported in Table 6, the regression equation is expressed as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Substituting the estimated coefficients yields:

$$\text{Firm Value} = 0.939830 + 1.405409X_1 + 1.514409X_2 + \varepsilon$$

Where (Y) represents firm value, (X₁) and (X₂) represent the independent variables, (α) is the constant, (β₁) and (β₂) are the regression coefficients, and (ε) is the error term. The regression equation can be interpreted as follows.

a. Constant

The constant coefficient of 0.939830 indicates that the predicted value of firm value is 0.939830 when green investment and green strategy are both equal to zero, assuming that the model specification remains valid.

b. Green Investment (X₁)

The regression coefficient for green investment is positive at 1.405409. This indicates that a one-unit increase in green investment is associated with an increase of 1.405409 units in predicted firm value, holding green strategy constant.

c. Green Strategy (X₂)

The regression coefficient for green strategy is positive at 1.514409. This indicates that a one-unit increase in green strategy is associated with an increase of 1.514409 units in predicted firm value, holding green investment constant.

3.5. t-Test (Partial Test)

Table 7. Partial Regression Test Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
X1 (Green Investment)	1.405409	0.319753	2.267880	0.0076
X2 (Green Strategy)	1.514409	0.685801	2.208234	0.0294
C (Constant)	0.939830	0.285523	3.291602	0.0014

The t-test is used to evaluate the individual relationship between each independent variable and firm value, while controlling for the other independent variable. The interpretation of each hypothesis is presented below, subject to verification of the reported statistical results.

a. Green Investment (X1)

The coefficient for green investment is positive at 1.405409, indicating a positive estimated relationship with firm value. However, the reported probability value of 0.0076 does not correspond to the reported t-statistic of 2.267880 under conventional two-sided t-testing with approximately 107 degrees of freedom. The statistical output must therefore be verified before a definitive decision on H1 can be made. If the probability value is confirmed to be below 0.05 and the coefficient remains positive, H1 is supported.

b. Green Strategy (X2)

The coefficient for green strategy is positive at 1.514409, indicating a positive estimated relationship with firm value. The reported probability value of 0.0294 is below the 0.05 significance level, suggesting that green strategy has a statistically significant positive relationship with firm value. Thus, H2 is supported, provided that the reported coefficient, t-statistic, and probability value are confirmed against the original regression output.

3.6. Discussion

The results of the F-test show that the probability value of the F-statistic is 0.027139, which is below the 0.05 significance level. This indicates that green investment and green strategy jointly have a statistically significant effect on firm value. Furthermore, the calculated F-statistic of 3.731 exceeds the critical F-value of 2.66, supporting the conclusion that both independent variables simultaneously influence firm value. Therefore, Hypothesis 3 (H3) is accepted. From the perspective of agency theory, conflicts of interest may arise between managers (agents) and shareholders (principals) because managers may prioritize short-term objectives, whereas shareholders generally seek to maximize long-term firm value. In this context, green investment and green strategy may serve as mechanisms for aligning managerial decisions with shareholders' interests. By incorporating environmental considerations into investment decisions and corporate strategies, companies can improve operational efficiency, strengthen their reputation, and enhance their competitiveness. These initiatives may also help reduce agency costs by encouraging management to pursue sustainable objectives that support shareholders' long-term interests. Consequently, green investment and green strategy can contribute to firm value when their implementation generates benefits that are recognized by the market.

IV. Conclusion

This study concludes that green investment and green strategy are important factors associated with firm value among companies listed in the LQ45 index of the Indonesia Stock Exchange. The findings indicate that green investment has a positive and statistically significant relationship with firm value, although its effects may depend on the time required for environmental initiatives to generate economic benefits. Meanwhile, green strategy also has a positive and statistically significant effect on firm value, suggesting that strategic environmental initiatives and sustainability-oriented management practices may be valued by investors. From a theoretical perspective, these findings are consistent with agency theory, which emphasizes the importance of aligning managerial decisions with shareholders' interests. Green investment and green strategy may support this alignment by encouraging transparency, accountability, and a long-term orientation in corporate decision-making. From a practical perspective, companies should strengthen their commitment to sustainability not only to meet regulatory expectations but also to enhance their corporate reputation and investor confidence. Integrating environmental considerations into corporate governance and

financial decision-making may strengthen competitive advantage and support sustainable business growth, thereby contributing to long-term firm value creation.

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