

Green Investment on Firm Value: Mediation of Profitability

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Abstract— Backgorund: Global warming is an increase in the earth's surface temperature due to the use of environmentally unfriendly products. Therefore, investors and companies need to be aware of the impact of global warming by adopting the concept of green investment.

Purpose: This research aims to determine (1) the effect of green investment on firm value; (2) profitability mediates the effect of green investment on the firm value.

Methodology: A sample of 24 SRI KEHATI stock index companies in the third quarter of 2023 and have Environmental, Social and Governance (ESG) value reports on Morningstar Sustainalytics. Partial Least Square with the SmartPLS application as a data analysis technique. **Findings:** (1) Green investment influences firm value; (2) profitability does not mediate the effect of green investment on the firm value.

Conclusion: Investors can adopt the green investment concept through ESG score indications thereby increasing firm value and sustainable long-term financial profits..

Index Terms— Green Investment, Firm Value, Profitability.

I. INTRODUCTION

Global warming is one of the main environmental issues facing the world today, where there is an increase in the earth's surface temperature due to the effects of greenhouse gas emissions and the use of products that are not environmentally friendly. Therefore, investors and companies need to be aware of the impact of global warming by carrying out green campaigns through the concept of green investment. The green campaign is a form of campaign as an effort to encourage emission reduction and socially inclusive development which emphasizes environmentally friendly economic progress and development by utilizing natural resources sustainably (Butticè, Colombo, Fumagalli & Orsenigo, 2019).

Green investment is an investment activity in shares, bonds or mutual funds issued by companies that carry out environmentally friendly business practices as an effort to maintain the continuity of the economy and life on earth (Chen & Ma, 2021). This research uses green investment indicators in the form of ESG risk values - Environmental, Social, and Governance (Aldieri, Amendola & Candila, 2023). The ESG risk score is an indicator that is in line with the SDGs (Sustainable Development Goals) policy which aims to achieve global sustainable development by evaluating companies, funding and security performance referring to environmental, social and corporate governance aspects (Cohen, 2023). Indonesia has a green index published by the Indonesian Biodiversity Foundation which is named the SRI KEHATI (Sustainable and Responsible Investment) index. The SRI KEHATI Index is a reflection of the share prices of 25 issuers that encourage sustainable business and

implement good corporate governance by implementing SDGs aspects with ESG risk value indicators (Akhmadi & Januarsi, 2021; Lata & Kumar, 2022). This is what differentiates it from research by Zhang, Xu & Feng (2022) which used the Public Disclosure Program for Environmental Compliance (PROPER) assessment as an indicator to measure green investment variables. Implementation of green investment is a form of strategy used by companies to increase profits without damaging the environment which is reflected in the firm's value. Firm value is a measure of the firm's success in past operational activities and future prospects as reflected in the firm's share price (Zhang, Qin & Liu, 2020). Based on this, the firm's ability to increase the value of its firm shares reflects the firm's ability to increase public trust and indicates that the firm has developed (Rahmawati, 2020; Lata & Mittal, 2023). This research uses a firm value indicator in the form of Market Value Added or what is called market capitalization to help evaluate firm performance in the market (Siedschlag & Yan, 2023). Companies that are better at implementing green investments will have the opportunity to be more competitive than their competitors in the stock market. A high share price indicates good firm value. Therefore, the implementation of green investment can give people confidence in companies in Indonesia to pay more attention to environmentally friendly company management practices so that it can have an impact on firm value (Deegan, 2019). This is in line with the research results of Zhang, Qin & Liu (2020); Lai, Yue & Chen (2022); Chang, Fu, Jin & Liem (2022) show that green investment has an effect on firm value. However, this is not in line with the research results of Chang, Ding, Lou, Li & Yang (2021); Wu, Liu, Zeng & Luo (2022) show that green investment has no effect on firm value. Firm value can also be increased through profitability. According to Ararat, Black & Yurtoglu (2017) defines profitability as the firm's ability to earn profits effectively and efficiently. This research uses a profitability indicator in the form of Return on Equity (ROE) which takes into account the total return from net profit on equity invested by shareholders (Dang, Vu, Ngo & Hoang, 2019). Implementation of green investment can provide public trust and improve the image firm from an environmental aspect, so this can increase the firm's profitability which is reflected in the increase in share prices and ultimately has an impact on increasing firm value. This is in line with the research results of Zhang & Berhe (2022); mediating the influence of green investment on firm value. Based on the phenomena and inconsistencies in previous research results, this research will look at the influence of green investment on firm value which is mediated by profitability.

A. Green Investment

Green investment is an investment activity in shares, bonds or mutual funds issued by companies that carry out environmentally friendly business practices as an effort to maintain the continuity of the economy and life on earth (Chen & Ma, 2021). This research uses green investment indicators in the form of ESG risk values by adding up the Environmental, Social and Governance risk levels obtained from Morningstar Sustainalytics (Aldieri, Amendola & Candila, 2023). The ESG risk score is an indicator that is in line with the SDGs (Sustainable Development Goals) policy which aims to achieve global sustainable development by evaluating companies, funding and security performance referring to environmental, social and corporate governance aspects (Cohen, 2023).

B. Profitability

Profitability is the firm's ability to earn profits effectively and efficiently (Ararat, Black & Yurtoglu, 2017). This research uses a profitability indicator in the form of Return on Equity (ROE) which takes into account the total return from net profit on equity invested by shareholders (Dang, Vu, Ngo & Hoang, 2019). The implementation of green investment can provide public trust and improve the firm's image from an environmental aspect, so that this can increase the firm's profitability as reflected in the increase in share prices and ultimately have an impact on increasing firm value.

C. Firm Value

Firm value is a measure of the company's success in past operational activities and future prospects as reflected in the firm's share price (Zhang, Qin & Liu, 2020). Based on this, the firm's ability to increase the value of its firm shares reflects the firm's ability to increase public trust and indicates that the firm has developed (Rahmawati, 2020). This research uses a firm value indicator in the form of Market Value Added or what is called market capitalization to help evaluate firm performance in the market (Siedschlag & Yan, 2023).

D. The Effect of Green Investment on Firm Value

Green investment is a sustainable investment that is needed to reduce the impact of greenhouse gas emissions, one of which is to generate profits from firm investment that considers environmentally friendly aspects (Alsayegh, Rahman & Homayoun, 2023). Companies that are better at implementing green investments will

have the opportunity to be more competitive than their competitors in the stock market. A high share price indicates good firm value. The implementation of green investment can give people confidence in companies in Indonesia to pay more attention to environmentally friendly company management practices so that it can have an impact on firm value (Deegan, 2019; Kumar and Lata, 2022). This is in line with the research results of Zhang, Qin & Liu (2020); Lai, Yue & Chen (2022); Chang, Fu, Jin & Liem (2022) show that green investment has an effect on firm value. Therefore, the first hypothesis of this research is formulated as follows:

H1 (a): Green investment has an effect on firm value

E. Profitability mediates The Effect of Green Investment on Firm Value

Profitability is the level of net profit that a company can obtain when carrying out its operational activities (Niyas & Kavida, 2023). The implementation of green investment can provide public trust and improve the firm's image from an environmental aspect, so that this can increase the firm's profitability as reflected in the increase in share prices and ultimately have an impact on increasing firm value. This is in line with the research results of Zhang & Berhe (2022); Helmina, Sutomo & Respati (2022) show that profitability mediates the effect of green investment on firm value. Therefore, the first hypothesis of this research is formulated as follows:

H1 (b-c): Profitability mediates the effect of green investment on firm value.

Figure 1 below explains the conceptual framework used in this research.

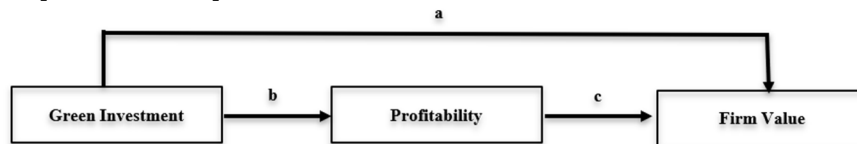


Figure 1. Research Conceptual Framework

Source: Ararat, Black & Yurtoglu (2017); Zhang, Qin & Liu (2020); Chen & Ma (2021)

II. RESEARCH METHODS

This research is quantitative research. This research uses a population of 25 companies listed on the Indonesia Stock Exchange (IDX) and indexed in the SRI KEHATI stock index in the third quarter (Q3) of 2023. The sample used in this research is 24 companies listed on the IDX and indexed in the stock index SRI KEHATI in the third quarter (Q3) also has an ESG value report on Morningstar Sustainalytics as shown in Table 1. The sampling technique for this research uses purposive sampling.

TABLE I. RESEARCH SAMPLE

No	Kode	ESG Score	Company Name
1	ANTM	40	Aneka Tambang (Persero) Tbk
2	ASII	33.36	Astra International Tbk.
3	BBCA	22.67	Bank Central Asia Tbk.
4	BBNI	21.35	Bank Negara Indonesia (Persero) Tbk.
5	BBRI	18.84	Bank Rakyat Indonesia (Persero) Tbk
6	BBTN	26.63	Bank Tabungan Negara (Persero) Tbk.
7	BMRI	28.18	Bank Mandiri (Persero) Tbk.
8	DSNG	35.4	Dharma Satya Nusantara Tbk.
9	ICBP	42.99	Indofood CBP Sukses Makmur Tbk
10	INCO	34.38	Vale Indonesia Tbk
11	INDF	39.63	Indofood Sukses Makmur Tbk.
12	INTP	29.84	Indocement Tungal Prakarsa Tbk.
13	JPFA	42.42	JAPFA Comfeed Indonesia Tbk
14	JSMR	12.92	Jasa Marga (Persero) Tbk.
15	KLBF	34.31	Kalbe Farma Tbk.
16	PTPP	39.5	PP (Persero) Tbk.
17	SILO	29.8	Siloam International Hospital Tbk.
18	SMGR	32.42	Semen Indonesia (Persero) Tbk.
19	SSMS	33.4	PT Sawit Sumbermas Sarana Tbk.
No	Kode	ESG Score	Company Name
20	TINS	52.37	Timah (Persero) Tbk
21	TLKM	27.09	Telekomunikasi Indonesia (Persero) Tbk.
22	UNTR	40	United Tractors Tbk.
23	UNVR	18.8	Unilever Indonesia Tbk.
24	WIKA	29.76	Wijaya Karya (Persero) Tbk.

Source: Data is processed (2024)

This research uses secondary data in the form of data obtained from the IDX and the SRI KEHATI stock index in the third quarter (Q3) as well as ESG value reports on Morningstar Sustainalytics. This research uses an independent variable in the form of green investment, a dependent variable in the form of firm value, and a mediating variable in the form of profitability. Table 2 shows the operational definitions of this research variable.

TABLE II. OPERATIONAL DEFINITION OF RESEARCH VARIABLES

Research Variable	Definition of Research Variables	Indicator
Firm Value	Firm value is a measure of the firm's success in past operational activities and future prospects as reflected in the firm's share price which is measured using Market Value Added, also known as market capitalization (Zhang, Qin & Liu, 2020).	Market Capitalization = Share price per share x Number of shares outstanding
Green Investment	Green investment is an investment activity in shares, bonds or mutual funds issued by companies that carry out environmentally friendly business practices as an effort to maintain the continuity of the economy and life on earth as measured using ESG risk score (Chen & Ma, 2021).	ESG Score = Environmental values + Social values + Governance values
Profitability	Profitability is the firm's ability to earn profits effectively and efficiently which is measured using ROE (Ararat, Black & Yurtoglu, 2017).	$ROE = \frac{\text{Net Profit}}{\text{Total Equity of common shares}}$

The testing technique uses (1) descriptive analysis of data to determine the mean, median, maximum and standard deviation values; (2) as well as construct variable analysis. The data analysis technique used in this research is Partial Least Square-Structural Equation Modeling (PLS-SEM) with the SmartPLS 4.1.0.0 application. Decision making in the mediation hypothesis refers to Hair, Hult, Ringle & Sarstedt (2022) which states that the role of mediating variables is grouped into 3 types of mediation namely: (1) if the relationship The independent variable is directly significant to the dependent variable, while the independent variable is significant to the mediating variable, and the mediating variable is not significant to the dependent variable, or the independent variable is not significant to the mediation, and the mediating variable is significant to the dependent variable, then the mediating variable does not mediate; (2) if the relationship between the independent variable is directly significant to the dependent variable, while the independent variable is significant to the mediating variable, and the mediating variable is significant to the dependent variable, then the mediating variable partially mediates; and (3) if the relationship between the independent variable is not directly significant to the dependent variable, while the relationship between the independent variable is significant to the mediating variable and the mediating variable is significant to the dependent variable, then the mediating variable provides full mediation.

III. RESULTS and Discussion

A. Results

i. Descriptive Analysis of Data

TABLE III. DESCRIPTIVE ANALYSIS OF DATA

	Green Investment	Profitability	Firm Value
Mean	31.919	0.098	152676576.2
Scale min	12.92	-0.533	3316562
Scale max	52.37	0.778	1087902316

Source: Data is processed (2024)

Based on Table 3, it shows that the average ESG risk value is 31.91, where the majority of companies in the SRI KEHATI index have a high risk for the environment. However, there are several companies with a low level of risk, namely PT. Jasamarga (Persero) Tbk where the ESG risk value is 12.92. Apart from that, the average profitability of company equity is 9.8% for all companies, where PT. Unilever Indonesia has a profitability of 77.8%. Apart from that, the average firm value shown by market capitalization is IDR 157 trillion where PT. Bank Central Asia has a firm value of IDR 1,087 trillion.

TABLE IV. OUTER LOADING VARIABLE

Variable	Outer loadings
Green Investment	1.000
Firm Value	1.000
Profitability	1.000

Source: Data is processed (2024)

Based on Table 4, it shows that all the variables to be tested have a factor loading of 1, which has a value above 0.7 (Hair, Hult, Ringle & Sarstedt, 2022). Therefore, the construct variables in this research can be said to be reliable. Furthermore, Table 5 shows the R Square value for the firm value variable of 0.206. This can be interpreted that the firm value variable can be explained by the green investment and profitability variables of 20.6% and the remaining 79.4% can be maximized by other variables outside these variables. Apart from that, the R Square value for the profitability variable is 0.104. This can be interpreted that the profitability variable can be explained by green investment of 10.4% and the remaining 89.6% can be maximized by other variables outside this variable.

TABLE V. R SQUARE VALUE

Variable	R Square
Firm Value	0.206
Profitability	0.104

Source: Data is processed (2024)

ii. Hypothesis test

TABLE VI. PATH COEFFICIENT INDIRECT EFFECT ESTIMATION RESULTS

No.	Variable	Path Coefficient	P-Value	Information
1.	Green Investment – Firm Value	-0.412	0.004	Significant
2.	Green Investment – Profitability	-0.302	0.124	Not significant
3.	Profitability – Firm Value	0.184	0.016	Significant

Source: Data is processed (2024)

TABLE VII. SPECIFIC INDIRECT EFFECT ESTIMATION RESULTS

No.	Variable	Path Coefficient	P-Value	Information
1.	Green Investment – Profitability - Firm Value	-0.055	0.553	Not significant

Source: Data is processed (2024)

Based on Table 6, the first hypothesis of this research shows that green investment has an effect on firm value. This is supported by the results of the path coefficient analysis of -0.412 and the p-value of green investment on firm value of $0.004 \leq 0.05$. This means that the higher the level of green investment, the lower the firm value. Based on Table 7, testing the mediating effect hypothesis, profitability does not mediate the effect of green investment on firm value with a path coefficient value of -0.055 and a p-value of $0.553 \geq 0.05$. Meanwhile, based on direct testing in Table 6, green investment has no effect on profitability, and profitability has an effect on firm value, so it can be concluded that profitability does not mediate the effect of green investment on firm value. Therefore, it can be concluded that the second hypothesis of this research is not accepted, namely that profitability does not mediate the effect of green investment on firm value. This means that the higher or lower the level of green investment, the higher or lower the profitability and value of the company will not be.

B. Discussion

i. The Effect of Green Investment on Firm Value: The results of the first hypothesis of this research show that green investment has an effect on firm value. This is supported by the results of the path coefficient analysis of -0.412 and the p-value of green investment on firm value of $0.004 \leq 0.05$ as shown in Table 6. Therefore, it can be concluded that the first hypothesis of this research is accepted, namely that green investment has an effect on firm value. This means that the higher the level of green investment, the lower the firm value. Apart from that, this also shows that good green investment has a good influence on firm value. The test results are in line with the theory of this research, where companies can receive public trust in the company's alignment with environmental aspects (Deegan, 2019). This can be seen from the firm value which is sensitive to changes in the value of green investment. Companies that have good environmental aspects can receive a good response from the public too, so that they can increase firm value where the company is considered to have a good image and can run a sustainable business. Companies that are better at implementing green investments will have the opportunity to be more competitive than their competitors in the stock market. A high share price indicates good firm value. The results of this research are in line with the research results of Zhang, Qin & Liu (2020); Lai, Yue & Chen (2022); Chang, Fu, Jin & Liem (2022) show that green investment has an effect on firm value.

ii. Profitability does not mediate The Effect of Green Investment on Firm Value: The results of the second hypothesis of this research show that profitability does not mediate the effect of green investment on firm value. This can be seen from Table 7, based on testing the mediating effect hypothesis, profitability does not mediate the effect of green investment on firm value with a path coefficient value of -0.055 and a p-value of $0.553 \geq 0.05$. Based on direct testing in Table 6, green investment has no effect on profitability, and profitability has an effect on firm value, so it can be concluded that profitability does not mediate the effect of green investment on firm value. Therefore, it can be concluded that the second hypothesis of this research is not accepted, namely that profitability does not mediate the effect of green investment on firm value. Based on this, an increase in a company's ESG risk value can cause negative sentiment towards the share price of the company concerned. However, this will not affect the firm's profits in the year the ESG risk value increases. The results of this study are not in line with the research results of Zhang & Berhe (2022); Helmina, Sutomo & Respati (2022) show that profitability mediates the effect of green investment on firm value.

IV. CONCLUSION

The research has the following results: green investment, expressed by the ESG risk value, has an influence on firm value, so that increasing the firm's ESG risk value can cause changes to the firm value, expressed by decreasing company valuation. Apart from that, profitability does not mediate the effect of green investment on firm value. Therefore, the firm's efforts gain public trust so that it can improve the firm's good image in the eyes of the public. This only directly affects firm value, but not profitability. Therefore, the presence of good environmental aspects cannot make a difference to the firm's profitability.

There are suggestions for future researchers to use other green investment indicators or access paid platforms with more complete features, so they can develop research in the past few years. Furthermore, further research can use other indicators to test corporate governance, as well as add other variables that are felt to influence firm value besides the factors used in this research. Suggestions for Indonesian companies, especially those indexed in SRI KEHATI, can maintain their good ESG risk scores, and try to reduce the risk level, especially for companies with high ESG risk scores. This is an effort so that the company can have the trust of the public to be able to run for a long time, as well as helping global efforts to resolve the problem of global warming. Suggestions for investors include considering green investment factors more, especially through indicating ESG risk values as a tool for making investment decisions. This is because the company sees that the green investment factor is a long-term factor that is able to weigh the suitability of a company to be trusted to survive in the long term. This effort is to reduce the risk of investors losing their assets to companies that are not credible and are unable to maintain their performance.

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