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Green Investment and Firm Value: The Role of Corporate Governance

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Abstract:

Research aims: This study aims to examine the effect of green investment on company value with corporate governance moderation

Design/Methodology/Approach: Green investment is proxied by the green-firm investment ratio i.e. growth in net investment value divided by asset value, while company value is measured by Tobin's Q, and corporate governance is proxied board size. The population of this study is companies receiving PROPER awards listed on the IDX for the 2017-2021 period, with samples selected based on a purposive sampling of 34 companies from the basic material, consumer non-cyclical, and consumer cyclical sectors. The data were analyzed using panel data regression, classical assumption test, T-test, and moderate regression analysis test (MRA) on Eviews 9.

Research findings: The results showed that green investment affects firm value. Furthermore, this study found that corporate governance does not moderate the effect of green investment on firm value.

Theoretical contribution/ Originality:. this research strengthened previous empirical evidence that green investment significantly influences firm value, which means that companies' implementation of green investment activities will impact increasing firm value. Although there is no strong evidence of the moderating role of corporate governance on the relationship between green investment and firm value, board size as part of effective governance needs to be paid attention to. The company board needs to be considered sufficient in number and not too large to positively affect performance.

Practitioner/Policy implication: This research has implications for companies to include green investment as an important investment decision because it is proven to be an advantage for companies to increase their value, as well as help them reduce environmental violations and improve performance.

Research limitation/Implication: this research's determining factor for firm value is only green investment and does not include other factors, and the corporate governance proxy only uses board size. Therefore, it is hoped that future research can explore the relationship between green investment, firm value, and corporate government with other new models that consider the characteristics of the sample industry, economic conditions in the research period, and other measures of the variables studied. It is needed for better clarity regarding the relationship between the three.

Keywords: Green Investment, Firm Value, Corporate Governance, PROPER, MRA

Introduction

Economic growth is important for any country because economic growth is one of the determining factors in a country's condition. If economic growth is positive, it can become a competitive advantage for that country. The level of economic growth can be determined by the amount of incoming investment, including investment contributions from businesses in the country—the increasingly positive economic growth trend after investors see the pandemic as a good investment opportunity.

Many investors consider investing, including developing share prices, as a form of assessment to measure a company's market performance. The measure of company performance begins when investors believe the company in which they invest their funds can provide good returns. Better stock price movements indicate that the returns generated will be higher. Share prices show the main assessment of all market players. Thus, share prices can be a benchmark for company management performance and reflect the company's ability to generate profits by using resources efficiently."

To maintain company activities in normal and crisis economic times, companies must adapt to the demands of optimizing firm value to provide shareholders with long-term and sustainable welfare. It can be achieved through investment activities. (Widarwati et al., 2022) state that the most important firm for generating future profits is investment. An implementation of a capital expenditure strategy will certainly improve firm performance because it will increase assets for future use that link to the increasing firm investment.

Investment decisions are crucial for maximizing shareholder wealth (Suman & Singh, 2021). Investment decisions that are not made carefully will result in fixed costs in the form of high capital costs, ultimately impacting company performance. The firm capital expenditure can be used to support its operational activities to make it more productive. The increased productivity can improve the firm's ability for better earning to the investors that increased firm's value (Wijaya, 2014).

However, the higher the company's operational productivity due to investment activities, the greater the carbon emissions and waste produced. It is a sensitive issue that companies need to address because changes in consumer and stakeholder behavior, climate change, and investor preferences, which are increasingly sensitive to sustainability issues, mean companies have different investment decision strategies than before (Chiţimiea et al., 2021). Companies can focus not only on financial factors but social and environmental welfare factors, as stated by Elkington (1999), namely the concept of sustainability that companies are created from the integration of triple bottom line principles, namely the ability to create profits, the ability to improve social life (people), and the company's ability to protect the environment (planet). It means that business activities are not only aimed at making profits for the company, but these activities also contribute to the interests of society and preserve the environment. The triple bottom line concept will help companies have a more sustainable business model.

In Indonesia's context, the firms that manage their business by carrying out sustainable activities are more attractive to investors, according to the results of the KIC survey (2022). As many as 66.1% of respondents own shares in companies prioritizing sustainable business and ESG practices. The reason is that they feel safer because of the company's good reputation. Companies with sustainable practices will have a good reputation, making them more attractive to investors.

Investors invest because they can help maintain environmental health. It means that environmental sustainability is one of the most important factors investors pay attention to. It is because environmental pollution by companies as a result of their operational activities includes pollution that can have long-term effects and damage the environment.

Increased awareness of global issues in the sustainable development goals (SDGs) agenda has triggered the emergence of the term "green investment" in the economic sector, especially financially. Green investment refers to capital activities demonstrated in projects addressing global issues such as energy savings, climate change, and social issues. On a corporate scale, the concept defines corporate investment activities aimed at protecting the environment, reducing pollution, reducing carbon emissions, using alternative energy sources and conserving natural resources (Chiţimiea et al., 2021).

In the Indonesian, the motivation of green investment implementation is tied to government regulations. It demonstrated in the Public Dislocation Program for Environmental Compliance (PROPER) obtained the Ministry of Environment and Forestry. PROPER is an appreciation award to improve the firm's environmental management performance by what has been stipulated in statutory regulations. The PROPER award is given to companies that have complied with environmental standards such as implementing an environmental management system with energy efficiency efforts, reducing emissions, implementing reduce, reuse, and recycle (3R), water conservation and biodiversity protection, as well as developing community development programs (proper .menlhk.go.id). Based on the VOS Viewer mapping by researchers in 2022, the PROPER criteria are similar to the concept of green investment related to climate change, carbon emissions, renewable energy, environmental quality, regulation, and sustainability. Therefore, companies that win the PROPER award reflect the implementation of green investment activities carried out by the company. A company's success in winning the PROPER award can be seen from its seriousness in investing its money in environmental issues (Chariri et al., 2019).

Investment decisions in companies can take different forms depending on the industrial sector. In non-financial industries, especially industries where the impact of their operational activities can cause environmental damage, such as manufacturing or mining, companies tend to invest in assets that help them minimize the impact of emissions, pollution and waste produced, such as investing in the installation of bag filters to reduce dust emissions, replacement and rejuvenation of production machines, and procurement of modern and environmentally friendly technology. Funds allocated

for these activities are a company signal to investors about environmental responsibility activities to gain trust.

Furthermore, The percentage of Indonesian companies listed on the Indonesian Stock Exchange still shows a lower figure than those not receiving this award. It reflects the low implementation of green investment by Indonesian companies, as shown in the following graph:

Figure 1. Firm Percentage of PROPER Award on IDX in 2017-2021
Source: PROPER Company Annual Report, 2017-2021

Green-based investment decisions can increase profits for companies and contribute to environmental and social interests. Therefore, green investment is a form of company performance that can increase value through sustainable development. Green investment helps companies prevent greater environmental damage and further helps companies to make environmental damage costs more efficient.

However, every investment decision has risks, including green investment, and to minimize these risks, the investment decision-making process and company activities need to be carried out based on managing the corporate well namely Good Corporate Governance (GCG) is useful in determining strategic direction, systematic performance, and company performance. Implementing good GCG is the main aspect of building solid fundamentals because company performance will not be sustainable if it is not based on good governance practices.

Corporate governance is important for directing the firm implementation of transparency, accountability, responsibility, independence, fairness, and equality principles. It is important for aligning the manager and shareholder interests (Suman & Singh, 2021). Poor governance quality cannot protect investors, so it cannot increase investor confidence, attract investment, and vice versa. Healthy corporate governance practices can eliminate agency problems, improve company performance, and maximize shareholder wealth (Shahid & Abbas, 2019).

Making good investment decisions is closely related to effective governance. Good governance is related to company decision-making in assessing a profitable investment because investment decisions involve large amounts of funds, so they support the company's strategic plans and determine profitability (Shahid & Abbas, 2019). The capability of firm boards, and audit committees determine the quality of investment

decisions (Shahid & Abbas, 2019). Inderst (2012) supported this, stating that the board of directors or supervisors contributes to investment decision-making. El-Kassar et al. (2015) in Chams and García-Blandón (2019) revealed that board members in corporate governance are considered the main contributors to obtaining various social activities, such as encouraging ethical and moral involvement, influencing philanthropy, implementing codes of ethics, compliance with laws and policies, awareness of environmental issues, social disclosure reporting, and stock market indicators.

A larger board size represents and creates relationships with a wider range of stakeholders and can provide access to greater information due to the board's diverse background, experience and knowledge. In addition, many councils can accommodate environmental experts to advise and engage in social and ecological practices. The board of directors must face pressure not only from shareholders but also from other stakeholders. It must consider the interests of different groups so that the board will consider every investment decision taken in the interests of stakeholders by developing investment opportunities that can provide good returns for stakeholders and companies.

A larger board of directors will be able to better comply with corporate sustainability laws and guidelines (Rossi et al., 2021). Large corporate boards tend to show a high corporate reputation, but increasing board numbers can lead to problems of coordination, control, and flexibility in decision-making. Investor confidence will reduce when there are wrong investment decisions (Widarwati et al., 2022). Therefore, investments will be managed and controlled well if the company has strong corporate governance.

Signal theory explains the signals that companies give to users of financial reports. Investor decisions can be influenced by the superiority of information disclosed by the company in financial reports in the form of information about what management has done to realize stakeholder desires. The superiority of information related to company investment and spending, returns, as well as including information from non-financial activities aims to minimize the emergence of information asymmetry. In addition, every decision taken in green investment activities is by legitimacy theory that important to gain recognition from the investor as well as the public about their operational decision linked to the community environment (Deegan, 2002).

Various studies have been conducted previously regarding green investment policies. Several previous studies found positive results of green investment with company performance (Chen & Ma, 2021; Nakamura, 2011), green investment with profitability (Khalid et al., 2023), and stock returns (Li et al., 2022). Clarkson et al. (2008). Selviana (2019) stated that capital expenditure on fixed assets could influence green activities because investment in new equipment is considered better for managing emissions. Hence, it has advantages in environmental performance. Moreover, it will significantly improve company performance (Nakamura, 2011). In research by Dwinanda et al. (2019), (Selviana, 2019), and Karim et al. (2021), it is revealed that companies with larger capital expenditures have a greater opportunity to disclose carbon emissions. Nevertheless, studies are still found that support negative results between green

investment and financial performance (de Souza Cunha & Samanez, 2013) and companies are encouraged to improve their performance using environmental management, which is proven unnecessary (Pekovic et al., 2018).

Many previous studies have linked green investment with external company factors, such as regulatory factors and government policies (Chen & Ma, 2021; Khalid et al., 2023; Du et al., 2019; Farooq et al., 2021; Yan et al., 2021). However, this research focuses on the following suggestions from Chen & Ma (2021) to integrate internal corporate governance factors, namely the board corporate mechanism, so that board size is used to measure corporate governance moderation. The basic supporting argument includes board size as a measurement of moderation, namely because investment decisions involve large amounts of funds, which will be risk-reducing or increase; with a large board, the company will be more involved in environmental conservation activities. Therefore, the board is the main structure in governance and has an important role as a decision-maker and supervisor (Shahid & Abbas, 2019) so that investment decisions can be considered and monitored as well as possible.

This research uses a green investment measure as per research by Chang et al. (2021), namely the green-firm investment ratio, which is the value of net investment growth divided by asset value. Tobin's Q ratio measures the firm value because it can reflect the long-term investment value (Chen & Ma, 2021). The unit of analysis chosen in this research is PROPER winning companies, which reflect the application of green activities in resource utilization and environmental management by applicable regulations. Furthermore, this research controls the relationship model between green investment and firm value with company size which functions as a control variable. The researcher argues that the company's large size, as seen from total assets, reflects its sufficient resources to finance its investments and generate more profits (Khalid et al., 2023; Nakamura, 2011).

It is hoped that the results of this research will provide theoretical benefits and contribute to strengthening previous research, as well as additional references and insights regarding green investment and firm value. In addition, it is hoped that the contribution of the results of this research can be a consideration for companies to make green investments in their sustainability strategy efforts, as well as for investors as investment considerations, and for the government to strengthen environmental conservation policies.

Literature Review and Hypotheses Development (Quantitative) or Literature Review (Qualitative)

Investment policy is important to determine the allocation of funds to alternative forms of investment that can provide benefits in the future. Managers can meet shareholder expectations through superior performance by creating strategies that are valuable and difficult to imitate. However, the high desire of companies to increase their productivity can result in environmental degradation which will ultimately damage sustainable economic growth, ultimately forcing companies to take an active part in environmental protection. Social and community pressure and government regulations mean

companies have different investments to respond to this. Thus, forming a new market competition pattern that automatically gradually improves environmental quality makes green investment an inseparable part of company investment. By paying attention to environmental factors, corporate investment can improve effective management relationships with the community and shareholders, thereby increasing company performance and value.

Green investment decision-making must be based on good corporate governance to achieve the company's competitive advantage. The company board, which consists of the board of commissioners and the board of directors, is the party that has a stake in this decision. A larger board size has a separate workload so that the company's investment and sustainability policy-making activities can be well monitored and can balance stakeholder demands.

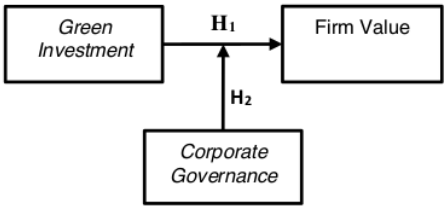


Figure 2. Research Model
Source: developed from Chen & Ma (2021) and Chang et al. (2020)

An investment is an investment made by a company to increase the company's wealth. A company's investment activity is reflected in how much the company allocates funds to forms of investment that can bring long-term profits to the company. According to signal theory, investment spending provides a positive signal that companies try to communicate as their opportunity to improve productive performance to gain profits in the future. Companies will make decisions and finance investments to maximize firm value through maximizing share prices (Grozdic et al., 2020).

Increasing spending on green investment and adjusting conducive industrial structures can improve green economic development indicators (Chen & Ma, 2021), giving companies a competitive advantage. Therefore, companies must make green investments as their long-term strategy (Chen & Ma, 2021; Nakamura, 2011). Firm profitability can be decreased when investments in environmental initiatives are not manageable well (de Souza Cunha & Samanez, 2013; Peković et al., 2018) because responding to environmental problems requires businesses to incur additional costs and financial constraints, thereby reducing productivity and firm value. Meanwhile, Grozdic et al. (2020) found that short-term capital investment has no effect on company performance, but long-term will have a significant impact.

H_1: *Green investment affects firm value*

This research uses a board-size proxy as a corporate governance mechanism. Corporate governance is a company's decision-making body defining strategic priorities and goals in various areas, including sustainability practices (Chams & García-Blandón, 2019) and financial results that can influence company performance (Bhatt & Bhattacharya, 2015).

The investment policy to allocate funds to green investments is a decision taken by the board to obtain future benefits and align environmental performance. Board size plays a key role in board quality in supervising and monitoring company management and influencing internal control quality. Large board sizes can include experts in environmental issues to advise and help navigate the uncertainties often involved in implementing green initiatives (de Villiers et al., 2011). A large board size will be more involved in green investment activities to create firm value. Companies with higher board sizes can effectively monitor the decisions made by financial managers and reduce the negative impact on investors' confidence in their investments. Increasing the board's supervisory function can control shareholder interests (Shahid & Abbas, 2019). Several studies claim that board size and firm value are not linear; however (Guo & Kga, 2012) show that increased board size will decrease the firm value then Merendino and Melville (2019) find that board size has a positive effect on the company performance for different levels of smaller board size.

H_2: *Corporate governance has moderated the relationship between green investment and firm value*

Research Method

Data and Sample

This research focuses on testing the effect of green investment on firm value with corporate governance as a moderating variable with the analysis unit of companies receiving PROPER awards registered on the IDX in 2017-2021, which were selected using a non-probability sampling technique with a purposive sampling approach. The sample includes basic materials, consumer non-cyclical, consumer cyclical, energy, healthcare and industrial sectors. The research method used is a quantitative method using a descriptive verification approach with secondary data sources obtained through the IDX website and company website, as well as data obtained via the internet and online searching. The data collection technique in this research uses documentation techniques from financial reports and the companies' annual reports as research samples.

Variable Measurement

Green Investment as an independent variable is measured using the green-firm investment ratio, namely the value of the increase in net investment to asset value (Chang et al., 2021). This measure can describe the level of change in the investment made by the company; the higher the ratio means that it shows an increase in investment made by the company. This increase in investment means there will be an opportunity to increase revenue for the company in the future, thereby affecting profitability, performance, and firm value.

$$\textit{Green-firm investment} = \frac{investasi\ bersih_t - investasi\ bersih_{t-1}}{total\ asset_t}$$

Net investment is the current year's net investment, while t-1 net investment is the previous year's net investment, and total assets reflect the current year's total assets. *Firm value is* proxied by Tobin's Q as a dependent variable because this ratio can effectively describe the company's long-term investment value (Chen & Ma, 2021). Tobin's Q can provide a more comprehensive picture of a company's market value and can reflect the company's prospects.

$$\text{Tobin's Q} = \frac{\text{MVE} + \text{Debt}}{\text{TA}}$$

MVE (Market et al.) is the product of the closing price and the number of shares outstanding, while Debt is debt and TA is total assets.

Corporate Governance, as a moderating variable, is proxied by board size, namely the number of members of the board of commissioners plus the board of directors. It is because this measure covers all board members in the company(Nasih et al., 2019). According to Bhatt and Bhattacharya (2015), Van Hoang et al. (2021) state that the larger the board size, the higher company performance will be, the division of work will be more orderly, and the size of the company board supports ethical behavior that encourages performance transparency.

Board size = ∑ Board of Commissioners members + ∑ Board of Directors members

Company size as a control variable is a size that describes the firm size that is measured by the firm total assets (Chen & Ma, 2021; Khalid et al., 2023).

Data Analysis

This research uses a simple linear regression model with data analysis techniques using panel data, a combination of time series, and cross-section data. The panel data moderation equation can be formulated as follows:

$$Y_{it} = \alpha + \beta_1 GI_{it} + \beta_2 FS_{it} + e \quad \text{.....pers (I)}$$

$$Y_{it} = \alpha + \beta_1 GI_{it} + \beta_2 GC_{it} + \beta_3 GI_{it}*GC_{it} + \beta_4 FS_{it} + e \quad \text{.....pers (II)}$$

It represents PROPER firm and time; respectively, FV is the Firm value proxied by Tobins'Q, and GI is green investment measured by the green investment ratio. CG is corporate governance proxied by the board size, namely the sum of the bank's commissioners and directors members, and ES reflects the firm size as measured by LN assets.

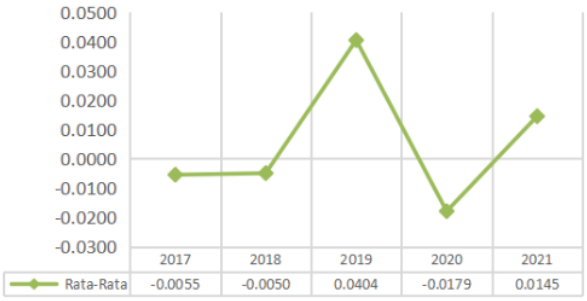
To test the hypothesis of the relationship between green investment and firm value, this research uses the T-test. At the same time, the moderating role of corporate governance is analyzed using the Moderated Regression Analysis (MRA) test. The research has

passed the classical assumption tests of data normality, autocorrelation, and heteroscedasticity.

Result and Discussion

Descriptive Analysis

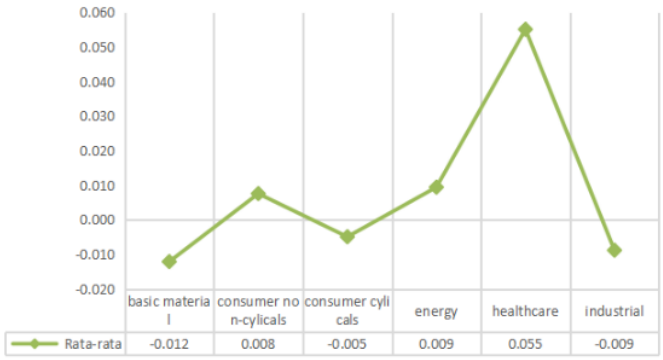
Green investment is a form of investment from environmentally friendly companies measured by the increase in net investment value divided by the company's total assets (Chang et al., 2021). The large net investment shown by the company indicates that the greater the potential income the company will obtain in the future.



Graph 1. Average Green Investment of Proper Companies in 2017-2021
Source: processed data, 2023

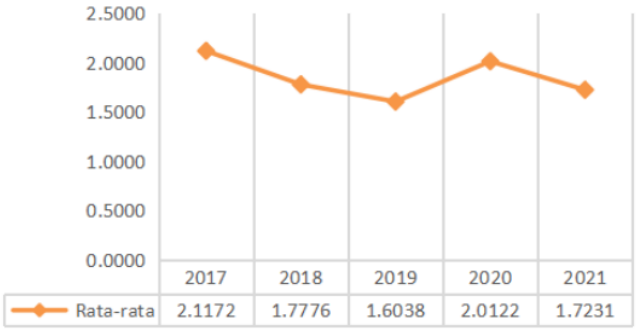
The green investment value in Indonesia's PROPER firm showed that 12 or the equivalent of 55%, had applied values of the green investment concept above the industry average, and the remaining 22 companies had values below the average.

There are still many companies that are below average, reflecting the lack of optimal implementation of green investment activities which the high cost of green investment could cause. This less-than-optimal allocation of green investment funds can decrease productivity and lower the PROPER rating, ultimately reducing the company's reputation. Therefore, allocating funds for green investment needs to be a concern for companies.



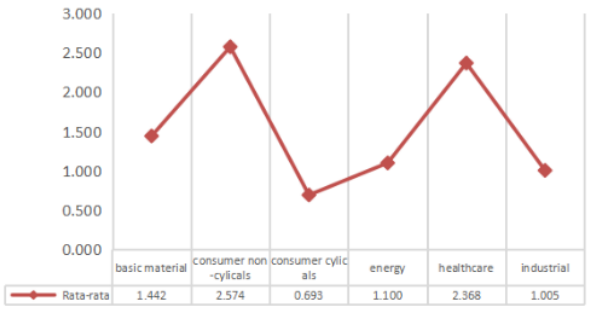
Graph 2. Average Green Investment of PROPER Firm Sector in 2017-2021
Source: processed data, 2023

Furthermore, this research show the consumer non-cyclical, energy and healthcare sectors have green investment values above the industry average. In comparison, the other sectors show values below the average to reach negative values, namely the basic materials sector, consumer cyclical, and industrial. The healthcare sector is the sector with the highest average and the basic materials sector is the sector with the lowest average. Sectors above and below the average have an equal number, so green investment per sector can still be categorized as not optimal.



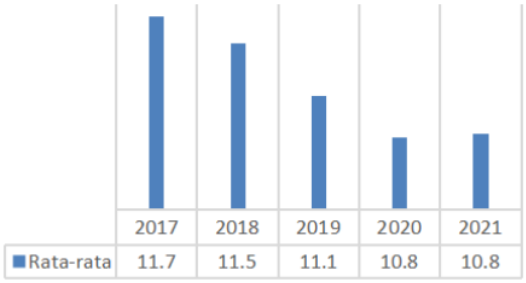
Graph 3. Average Firm Value of PROPER Firm in 2017-2021
Source: processed data, 2023

The results of the firm value data measured by Tobin's Q ratio show that almost 80% of Indonesia's industry has an average firm value under 1.00. However, there are only 8 companies that have a value above the average, and the remaining 26 have a firm value below the average. There are still many firm values that are below average, reflecting that the reputation of most companies has not been assessed well by investors who see the low value of green investment, and this has an impact on investor confidence, thereby triggering a decline in firm value.



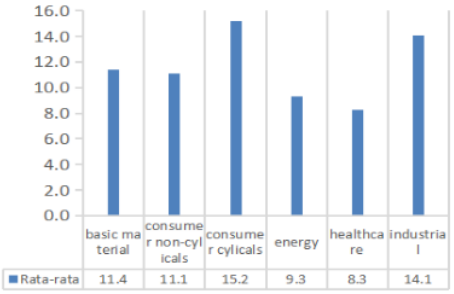
Graph 4. Average Firm Value of PROPER Firm Sector in 2017-2021
Source: processed data, 2023

The average firm value in Indonesia's industry sample shows a value of 1,530, and the consumer non-cyclical and healthcare sectors have higher than it. The firm value of property companies tends to be less good because there are still more below-average sectors.



Graph 5. Average Board Size of PROPER Firm in 2017-2021
Source: processed data, 2023

The study measures Corporate governance using board size, namely the total number of commissioners and directors in a company's organizational structure.



Graph 6. Average Board Size in PROPER Firm Sector in 2017-2021
Source: processed data, 2023

Descriptive data analysis for 2017-2021 shows that an average board size in Indonesia's industry is 11 people, and 52% have a board number less than the industry average. The implementation of the composition of the number of boards, both boards of commissioners and directors, in companies that obtain PROPER is by regulations.

Table 1. Descriptive Statistics

	X	Y	M	K
Mean	0.017007	1.063275	11.12308	29.73089
Median	0.001298	1.050170	11.00000	29.76118
Maximum	1.626938	1.757760	21.00000	33.53723
Minimum	-0.191130	0.358588	4.000000	25.79571
Std. Dev.	0.166060	0.302375	3.702116	1.702384
Skewness	7.248022	0.147591	0.551046	0.122336
Kurtosis	69.66479	2.351240	2.771582	2.575422
Observations	130	130	130	130

Source: Researcher Data, 2023

Graph 10 shows that 2 sectors have a board number above the average, namely the consumer cyclical and industrial sectors and 4 other sectors that have a number below the average, namely the basic materials, consumer non-cyclical, energy and healthcare sectors. The consumer cyclical sector has the highest board average of 15.2 or 15 people, and the healthcare sector has the lowest board number of 8.3 or an average of 8 people.

Test the Panel Data Regression hypothesis

This research examines the relationship between green investment and firm value moderated by corporate governance with a hypothesis-testing approach using panel data regression analysis and MRA analysis. Panel data regression analysis is data analysis that has a combined type of data from time series data and cross-section data and the panel data model selected in the Random Effect Model (RE).

As expected, this research proves that green investment significantly influences firm value. However, this research does not find strong evidence of the moderating role of corporate governance on the relationship between green investment and firm value. Furthermore, this research shows that the control variable company size significantly controls green investment on firm value.

Table 2. Hypothesis Test Analysis

Dependent Variable: Firm Value *(FV)*	model 1	model 2
Independent Variable: *Green Investment (GI)*	0,5477*	0.8277*
	(0,1255)	(0.4211)
Moderating Variables (Moderating Interactions)	-	-0.0356
Corporate Government (CG)	-	(0.0502)
Control Variable: *Firm Size (FS)*	0.0719*	0.0863*
	(0.0166)	(0.0216)
Year dummies	Not Included	Not Included
Constant	Included	Included
Method	RE	RE
Adjusted R-squared	0,2022	0,1989

This table presents the results of panel data regression of the research model. The dependent variable is firm value proxied by TOBINS'Q (FV); the independent variable is governance proxied by board size BRDSZE and age of directors AGEBRD; BRISK is bank risk measured by Z-score as insolvency risk level. The control variables are bank size(BSIZE) measured by Ln asset. The values in parentheses are standard errors. *significant 1% ; **significant 5%.

This research results are in line with research by Nakamura (2011), Chen & Ma (2021), Khalil & Nimmanunta (2023), and Khalid et al. (2023) with different research measurements that green investment influences the growth of profitability, performance, and firm value so that investments made by companies can maximize shareholder value. High investment in a company will reflect that the company has long-term prospects for making profits. The large amount of funds allocated for investment can provide a positive signal to shareholders that the company has the potential to earn greater income and can provide profits for them in the future. It is supported by research by Widarwati et al. (2023) which found a significant investment influence on company performance. Normally, companies continue to invest by spending capital to acquire new equipment or improve fixed assets to improve company performance. Meanwhile, companies do not invest in the company during a crisis and tend to survive, so the company performance increase is insignificant.

The form of investment in companies that receive PROPER is not limited to conventional forms of investment in general. Still, there is additional investment in assets that can minimize the impact of environmental damage from their operational activities, such as investment in more sophisticated technology and the ability to minimize waste. Companies that make green investments will have a smaller risk of conflict with stakeholders because the company has fulfilled its interests by trying to build its sustainability performance. Apart from that, even though green investment will require large costs, the benefits will be greater because companies can be more efficient in minimizing the costs of environmental damage and claims for the damage caused. It can also create good relationships with the community so that public demand for using the company's products will increase. Therefore, the results of these investment activities

can impact increasing operational productivity, increasing future income and ultimately improving performance.

According to the signal theory, an increase in firm value will reflect company performance because companies will provide information related to their performance, which can form positive investor sentiment, such as information on profitable investment decisions. The results of these investment decisions also need to consider all the impacts and risks that will be obtained because companies are not only responsible to investors but also to stakeholders and the communities around which they operate. Hence, the sustainability of the surrounding environment also needs to be maintained. So investment decisions are also in line with the legitimacy theory that companies need to carry out their obligations by the rules and norms in their environment. The better the level of investment that pays attention to the environmental impact, the more it will help the company increase its PROPER score so that its environmentally friendly image will also be maintained.

This research found that board size has no role as moderation in the relationship between green investment and firm value. It seems to contrast with the finding of Guo and Kga (2012) which claims a negative relationship between board size and firm value. Merendino and Melville (2019) suggest that larger boards can increase communication and coordination problems and higher agency costs, larger boards can face greater levels of conflict, and poor coordination among directors leads to slow decision-making and delays in information transfer. Furthermore, the firm with a higher board number has higher performance than the firm with lower board sizes. These findings highlight that boards should be adequate but not too large (Merendino & Melville, 2019) as well as recommend a maximum board size of 10 members (Bhatt & Bhattacharya, 2015)

Therefore, a large board size can be inefficient because it will face greater difficulties in reaching agreements, including environmental-based investment decision-making agreements. It is in line with the finding of Van Hoang et al. (2021) showing that the number of board members is not a factor that helps improve environmental performance and transparency. So, a large board size is not a benchmark for a company to work more effectively because good governance practices are more influenced by the ability and integrity of the board itself than by its number.

Furthermore, this research finds that company size significantly controls the influence of green investment on firm value without and with the corporate governance moderating variable. It is in line with research by Chen and Ma (2021), Khalid et al. (2023), and Saif Ul Islam et al. (2022) that company size can be a controlling factor in the relationship between investment and firm value.

Conclusion

The green investment of PROPER firms shows there is a positive increased investment but still cannot exceed the overall average because firms with below-average investment values still dominate. The implementation of green investment in Indonesia appears to be increasing and shows that the concept of green investment, especially in PROPER firms, is not yet optimal. It impacts the value of a PROPER firm that shows that

more companies have lower Tobin's Q than the industry average which reflects a good enough firm's reputation for investors. This condition can be triggered by unoptimized governance by board members in the applicable regulations. Firms need to improve performance by increasing share prices, forming positive stakeholder and investor sentiment such as maintaining company productivity and increasing the company's competitive advantage through sustainability performance, including environmentally based investments to maintain productivity and PROPER ratings so that the company's environmentally friendly reputation can be maintained.

Furthermore, this research strengthened previous empirical evidence that green investment significantly influences firm value, which means that companies' implementation of green investment activities will impact increasing firm value. Although there is no strong evidence of the moderating role of corporate governance on the relationship between green investment and firm value, board size as part of effective governance needs to be paid attention to. The company board needs to be considered sufficient in number and not too large to positively affect performance.

The findings of this research have implications for companies to make green investment a sustainability strategy to increase their firm value and build governance oriented towards achieving these goals. This research has several limitations, namely, the unit of analysis used in this research is limited to companies that have received PROPER awards, so the results obtained cannot be generalized to all companies. Apart from that, this research's determining factor for firm value is only green investment and does not include other factors, and the corporate governance proxy only uses board size. Therefore, it is hoped that future research can explore the relationship between green investment, firm value, and corporate government with other new models that consider the characteristics of the sample industry, economic conditions in the research period, and other measures of the variables studied. It is needed for better clarity regarding the relationship between the three.

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