



Green Initiatives and Firm Value: The Moderating Effect of Environmental Performance

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ABSTRACT

This study examined the impact of green initiatives on firm value and the moderating effect of environmental performance on the relationship between the variables. The proxies of green initiatives are green innovation, eco-efficiency, green accounting, and carbon emissions disclosure, while the indicators of firm value are market capitalisation, price-to-book value, price-earnings ratio, and dividend payout ratio. Environmental performance is measured by the Environmental Performance Rating Program issued by the Indonesian Ministry of Environment and Forestry. The data were gathered from listed companies on the Jakarta Islamic Index 70 (JII-70) and the IDX-80 index over the period 2019 to 2022. The final samples consist of 66 companies (or 172 firm-year observations). Using the Partial Least Squares Structural Equation Modeling (PLS-SEM), this study found green initiatives has a positive impact on firm value when tested using the total sample as well as a separate sample of each index. However, no empirical evidence was found that environmental performance enhances the positive impact of green initiatives on firm value. The regulators should incorporate environmental performance alongside financial fundamentals into the selection process of the Jakarta Islamic index.

Inisiatif Hijau dan Nilai Perusahaan: Efek Moderasi dari Kinerja Lingkungan

ABSTRAK

Penelitian ini menguji dampak dari inisiatif hijau terhadap nilai perusahaan dan efek moderasi dari kinerja lingkungan terhadap dampak tersebut. Inisiatif hijau diukur dengan menggunakan empat indikator: inovasi hijau, efisiensi lingkungan, akuntansi hijau, dan pengungkapan emisi karbon. Empat indikator nilai perusahaan yang digunakan adalah kapitalisasi pasar, nilai buku, rasio harga-pendapatan, dan rasio pembayaran dividen. Kinerja lingkungan diukur dengan Program Penilaian Peringkat Kinerja Perusahaan (Proper) yang dikeluarkan oleh Kementerian Lingkungan Hidup dan Kehutanan. Data dikumpulkan dari perusahaan-perusahaan yang terdaftar di Jakarta Islamic Index 70 (JII-70) dan indeks IDX-80 selama periode 2019 hingga 2022. Sampel akhir terdiri dari 66 perusahaan dengan total 172 observasi. Dengan menggunakan, Partial Least Squares Structural Equation Modeling (PLS-SEM), penelitian ini menemukan bahwa inisiatif hijau memiliki dampak positif terhadap nilai perusahaan ketika diuji menggunakan sampel total maupun sampel terpisah dari setiap indeks. Namun, hasil analisis data tidak menunjukkan adanya bukti empiris bahwa kinerja lingkungan meningkatkan dampak positif inisiatif hijau terhadap nilai perusahaan. Regulator harus memasukkan kinerja lingkungan bersama dengan fundamental keuangan ke dalam proses seleksi Jakarta Islamic Index. Berbagai indikator inisiatif hijau, penggunaan kinerja lingkungan sebagai variabel moderasi, dan teknik kelompok diskusi terfokus yang digunakan untuk memperkuat hasil adalah hal baru dalam penelitian ini.

1. Introduction

Global temperatures continue to rise, with fossil fuels accounting for over 75% of greenhouse gas emissions (United Nations, 2023). Companies, particularly those contributing the most to such emissions, face increasing pressure to fundamentally reorganise their operations to include comprehensive environmentally-friendly programmes, known as "green initiatives." These aim to reduce energy consumption; enforce sustainable practices across environmental, social and economic domains; and enhance the use of renewable energy sources.

However, the adoption of green initiatives presents a significant challenge for companies, particularly in the context of the capital market. On one hand, investors are increasingly attentive to environmental performance, with many prioritising investments in companies that demonstrate strong environmental, social and governance (ESG) practices. On the other hand, the implementation of green initiatives often involves substantial upfront costs, which can negatively impact short-term profitability and consequently firm value in the eyes of the market.

This study explores this tension by examining the impact of green initiatives on firm value, using four key indicators: eco-efficiency, green innovation, green accounting, and carbon emissions disclosures. While eco-efficiency initiatives can optimise resource use and minimise environmental harm (Meutia et al., 2019; Muthu, 2020), they may also require significant investments that reduce short-term earnings. It is a similar situation with green innovation, which aims to minimise energy consumption and material usage, and to prevent pollution (Li et al., 2020), and with green accounting practices, which aim to enhance sustainability, as the financial burden they involve can deter investors focused on immediate returns.

The reaction of the capital market to such green initiatives has been mixed. Some studies, such as that of Cerciello et al. (2023), suggest that green initiatives can lead to higher costs and reduced

earnings, thereby lowering returns for investors. Siemroth and Hornuf (2023) also demonstrate that investors will allocate higher capital to ecologically sustainable enterprises, provided that the project offers competitive returns. Similarly, Ouadghiri et al. (2021) found that there was a negative influence of environmental issues on returns on shares. In line with the findings of the global investor survey by PwC (2023), investors are still putting ESG considerations in third place in their business decisions, after product development innovation and the maintenance of profitable financial performance.

Conversely, other research, including that of Bonini and Swartz (2014), indicates that companies with high ESG performance can attract more investment, reduce their capital costs, and outperform the market over the medium to long term. Siddique et al. (2021) further confirm that disclosing carbon emissions has an adverse effect on immediate financial performance, but a beneficial one in the long run. Riaz et al. (2021) also stress the importance of adopting a long-term business mindset to effectively balance environmentally-sustainable practices with firm expansion.

This study seeks to address the incongruity between these perspectives by investigating whether green initiatives ultimately enhance or diminish firm value, particularly in the context of the capital market. By understanding the conditions under which such initiatives contribute to firm value, the research aims to provide insights to help guide companies in aligning their environmental strategies with investor expectations.

To support the implementation of green initiatives, the Indonesian government through the Ministry of Environment and Forestry also promotes the Company Performance Rating Assessment Programme (PROPER) in environmental management. Environmentally high-impact companies such as those on the mining industry are evaluated and ranked. However, some sectors are not interested in participating in the programme due to the intricate and costly assessment process (Dinas Kominfo Prov Jatim, 2015). Despite this, several

studies have shown that the PROPER ranking has a positive influence on performance (Deswanto et al., 2018); in addition, investors will react positively to good ranking announcements (Ihsani et al., 2021). Therefore, the second objective of this research is to examine the role of environmental performance measured by PROPER ranking in moderating the impact of green initiatives on firm value.

Studies on the green economy and business have seen rapid growth since 2016, reflecting increasing global attention to sustainability issues, including in Indonesia (Zhu et al., 2023). However, while significant progress in environmental research has been made, the relationship between environmental initiatives and firm value remains underexplored in several key areas. Previous studies have often focused on isolated aspects of green initiatives and their impact on firm value. For instance, the influence of carbon emission disclosure on performance was examined by Alsaifi et al. (2020), Monica et al. (2021), Muhammad and Aryani (2021), Ramadhana and Windijarto (2023), and Ramadhan et al. (2023). Similarly, studies such as those by Amalya et al. (2022), Astuti et al. (2022), Dianty (2022), and Khan and Gupta (2023) have concentrated solely on the impact of green accounting on firm performance. These studies typically address only one or two dimensions of green initiatives, leaving a gap in understanding their comprehensive effects on firm value. Moreover, the relationship between environmental performance and firm value has been less frequently explored, with studies such as those of Kheireddine et al. (2023) and Ramadhan et al. (2023) providing some insights, but without fully addressing the interaction between green initiatives and firm value.

Given the gaps identified in previous research, this study aims to provide a more holistic examination of green initiatives by incorporating four key indicators: eco-efficiency, green innovation, green accounting, and carbon emissions disclosure. These were selected because they collectively represent the full spectrum of sustainable business practices, from resource

efficiency, to financial transparency, and environmental responsibility. By examining these variables together, the study seeks to provide a more comprehensive understanding of how green initiatives influence firm value.

The research offers several novelties that set it apart from previous studies. First, it introduces a comprehensive variable measurement framework that captures the multidimensional nature of green initiatives. Unlike previous studies that focused on individual aspects such as carbon emissions disclosure or green accounting, this research integrates multiple indicators to provide a more complete picture of how green initiatives impact firm value. Second, the study introduces environmental performance as a moderating variable, which allows for a more in-depth analysis of how the effectiveness of green initiatives varies based on a firm's environmental track record. This approach contrasts with earlier research that primarily focused on direct effects, thereby offering new insights into the contingent nature of the impact of green initiatives on firm value. Third, the research methodology includes a robustness check by testing the model across different sub-samples (JII 70 and IDX 80). This approach ensures that the findings are not only applicable to a broader range of companies, but also reveals industry-specific dynamics, something that most studies, such as those by Gantino et al. (2023) and Hafsyah and Choiriah (2023), have not fully explored. Hence, this study fills the void in the literature on the green economy and business, particularly in the context of the capital market.

The study utilises a sample of publicly-traded firms listed on the Jakarta Islamic Index (JII) 70 and IDX 80 over the period 2019 to 2022. The selected companies are also participants of the PROPER program. The final sample consisted of 66 companies with a total of 172 financial years of observations. The study employs Partial Least Squares Structural Equation Modeling (PLS-SEM), which is appropriate for testing the relationship between latent variables with multiple indicators.

2. Literature review and hypotheses development

The implementation of green initiatives can be explained using stakeholder and legitimacy theory. Stakeholder theory highlights the interconnection between businesses and various entities such as consumers, suppliers, investors, society, and other interested parties. It proposes that corporations are obligated to make a profit for all stakeholders, rather than solely prioritising shareholders (Beckman et al., 2016). Stakeholders can encourage management decisions to make carbon emissions disclosure (Ramadhany et al., 2021). Tauringana and Chithambo (2015) explain that managers have the duty to ensure environmental performance by providing stakeholders with environmental information. Green initiatives can also be examined through legitimacy theory, which posits that a company's actions align with the societal values, norms and beliefs (Suchman, 1995). The theory connects companies and the environment. When disclosing environmental issues, companies are delivering signals; Agustia et al. (2019) state that conveying and revealing information is a successful method for expressing matters pertaining to social and environmental difficulties, as well as for enterprises to achieve operational legitimacy from the community.

The influence of green initiatives on firm value

Theoretically, the implementation of green initiatives leads to increasing firm value. However, empirical data have obtained various results. Green innovation and eco-efficiency have been proven to have a positive influence on firm value (Boakye et al., 2021; Agustia et al., 2019; Husnaini & Tjahjadi, 2021). Other findings show conflicts between a company's internal and external costs (Osazuwa & Che-Ahmad, 2016). Voinea et al. (2020) found different findings, namely environmental management systems or eco-efficiency have a negative influence on company shares, due to the impact of costs incurred. Hazudin et al. (2015) even showed that environmental management system

practices have no effect on increasing shareholder value.

Green accounting programmes consistently demonstrate a positive impact on firm value and influence investor decisions (Alexander, 2023; Dianty, 2022). Tu and Huang (2015) found that while green accounting has a detrimental impact on company profitability, it could boost the competitiveness of Taiwanese companies. Carbon emissions disclosure also has various impacts on firm value. Blesia et al. (2023), Han et al. (2023), Matsumura et al. (2014), Saka and Oshika (2014), and Sun et al. (2022) demonstrated that disclosure of greenhouse gas emissions had a positive and significant influence on firm value. However, Kurnia et al. (2021) and Ramadhan et al. (2023) show that disclosure of carbon emissions is meaningless for investors if it does not provide improved financial performance, while Iskandar and Fran (2016) and Muhammad and Aryani (2021) prove that carbon emissions disclosure has a negative influence on firm value. However, Agustia et al. (2019) failed to demonstrate a significant influence of carbon emissions disclosure on firm value.

These previous studies have obtained inconsistent findings regarding the impact of green innovation, eco-efficiency, green accounting, and carbon emission disclosure on firm value. However, due to mounting public pressure and more comprehensive regulations on the implementation of green initiatives, the first hypothesis proposed is: H1: Green initiatives have a positive effect on firm value.

The role of environmental performance in moderating the effect of green initiatives on firm value

Social and business missions must be aligned to create a sustainable business. Chen et al. (2015), Makhdoom et al. (2023) and Wu et al. (2020) argue for the necessity of a company strategy that establishes a connection between market orientation and environmental performance. A company's

dedication to adopting eco-friendly practices will be reinforced if green initiatives are transformed into strategic measures that enhance value. Empirically, the impact of green activities on firm value has yet to be fully optimised (Deswanto et al., 2018; Hazudin et al., 2015; Kurnia et al., 2021; Voinea et al., 2020; Ramadhan et al., 2023). Therefore, it is necessary to encourage other factors to strengthen the positive influence of green initiatives on firm value. As a result, the idea emerged to analyse the role of awards for environmental performance initiated by the ministry of environment and forestry aimed at strengthening the positive influence of green initiatives on performance. Previous studies analysing the moderating role of environmental performance include those of Hardiyansah and Agustini (2021) and Kheireddine et al. (2023). According to legitimacy theory, awards serve as a form of acknowledgment that enhances a favourable reputation, thereby attracting public attention, including that of investors (Indriastuti & Mutamimah, 2023; Khanifah et al., 2020). Investments in eco-conscious enterprises will financially secure and promote the long-term viability of the planet. Therefore, the second hypothesis posited is:

H2: Environmental performance strengthens the impact of green initiatives on firm value

3. Research method

The samples were publicly traded companies listed on the JII-70 and IDX-80 indices and registered as participants in the PROPER programme run by the ministry of environment and forestry. This study examines data over the period from 2019 to 2022. The selection of the two indices aimed to assess the robustness of the model. If the same model is tested on more than one sub sample and consistently yields the same conclusion, this indicates that the model is robust. Companies on both indices have strong liquidity and market capitalisation, indicating that the samples are homogeneous, thus leading to increased data reliability. The research began in 2019 due to the inclusion of carbon emission disclosure in the Indonesian financial service authority regulation no 51/POJK.03/2017, effective since 2019. From 2019 to 2022, the JII 70 index included 130 companies, but only 37 appeared in the PROPER evaluation. Similarly, the IDX 80 index listed 121 companies, of which 29 were on the PROPER list. The final sample consisted of 66 companies, covering 172 firm years.

The study examines the impact of green initiatives on firm value, together with the effect of environmental performance in moderating the influence of green initiatives on firm's value, as shown in Figure 1.

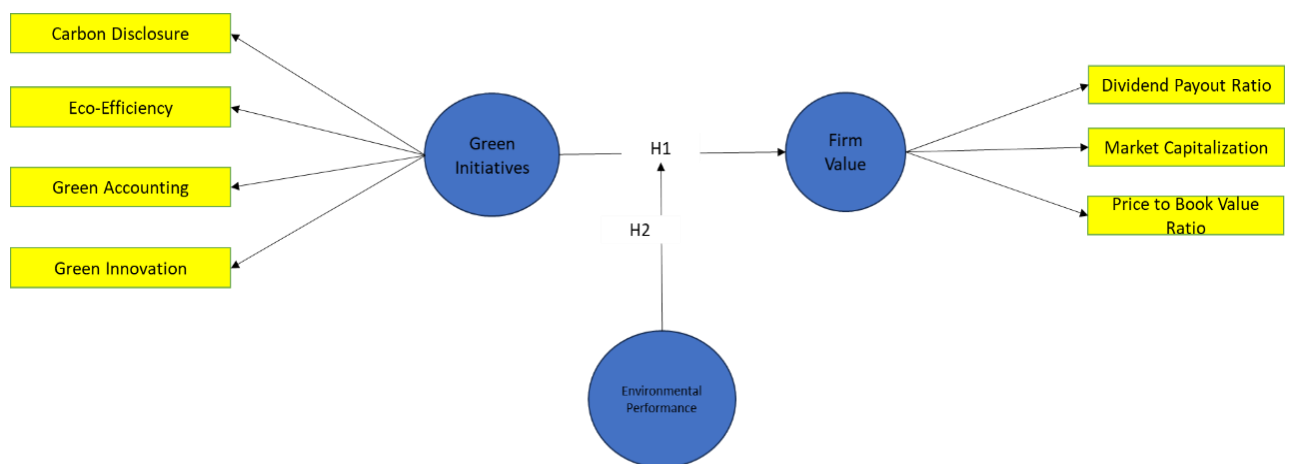


Figure 1. Conceptual model

The exogenous latent variable refers to green initiatives measured using four indicators: green

innovation, eco-efficiency, green accounting, and carbon emissions disclosure. The term 'green

initiatives' is also employed by Paul et al. (2018). Carbon emissions disclosure is assessed using content analysis of reports, considering 18 disclosure items related to carbon emissions, as part of the company's efforts to maintain legitimacy and protect its value. Eco-efficiency is also measured by content analysis, with companies receiving a score of 1 if they have ISO 14001 certification, and 0 if they do not. Green accounting is evaluated based on the disclosure of environmental costs in financial reports, with a score of 1 if such costs are reported, and 0 if not. Green innovation refers to efforts to reduce energy and material usage and prevent pollution in the production process. It is measured through content analysis of published reports, where a score of 1 is assigned if the company discloses all four components of green innovation, such as water and energy-saving technology, eco-friendly materials, packaging, and recyclable materials. The endogenous variable is firm value, which is assessed using four indicators: price to book value, price

earnings ratio, dividend payout ratio, and market capitalisation. Environmental performance is the moderating variable, measured using PROPER assessment ratings provided by the Ministry of Environment and Forestry. Table 1 gives a comprehensive description of each variable, including indicators and measures.

The data were obtained from annual reports, sustainability reports, and official ranking data released by the Ministry of Environment and Forestry. They were examined using the SEM-PLS technique, beginning with validity and reliability assessments. This technique is suitable for examining the association between variables that have a theoretically robust connection (Wijanto, 2015). It allows for the inclusion of numerous variables inside a single model, thus enhancing its comprehensiveness. It is a versatile method that does not require the assumptions of parametric testing. Therefore, it is suitable for analysing a small, well-selected dataset.

Table 1. Operational definitions and variable measurement

Variable	Indicator	Measurement	References
Green initiatives are a holistic, environmentally friendly effort to reduce energy consumption; use renewable energy; and implement sustainable practices from economic, social and environmental perspectives.	Eco-efficiency is an effort to reduce ecological damage to a minimum along business process lines and at the same time to maximise efficiency	Content analysis of published reports; scored 1 if the company has ISO 14001 certification; 0 if it does not	Meutia et al. (2019), Muthu (2020)
	Green innovation is an activity to minimise energy, reduce material use, and prevent pollution in the production process. It comprises four components: (1) production processes that use water, energy and waste saving technology; (2) products that use environmentally friendly materials; (3) use of environmentally-friendly packaging; and (4) materials or components	Content analysis of published reports; score 1 if each of the four components of green innovation is revealed; 0 if they are not revealed	Lee et al. (2023), Li et al. (2020)

used in the production process that can be recycled

Green accounting is an accounting system that in the process of recognising, measuring and presenting financial reports considers costs related to environmentally-friendly company activities

Content analysis of published reports; scored 1 if the company has components related to environmental costs; 0 if it has none

Indriastuti and Mutamimah (2023)

Carbon emissions disclosure is the presentation and disclosure of environmentally-friendly activities as a form of communicative legitimacy to manage threats to legitimacy and protect company value

Content analysis of published reports on 18 carbon emission disclosure items

Kurnia et al. (2021), Han et al. (2023)

Firm value is investors' perception of a company's success

Price to book value ratio

The ratio of price per share to book value per share

Rahim et al. (2021), Singla and Prakash (2023), Putri and Kisman (2022)

Price earnings ratio

The ratio of price per share to earnings per share

Dividend payout ratio

The ratio of dividends per share to earnings per share

Market capitalisation

The market price of a share multiplied by the number of shares outstanding

Environmental performance refers to a company's work performance in creating a good environment as a form of company performance and responsibility

Environmental performance management rating

Scores of 1 to 5 are based on PROPER (Public Disclosure Program for Environmental Compliance) environmental performance ratings initiated by the Ministry of Environment and Forestry.

Deswanto et al. (2018)

4. Results and discussion

Descriptive statistics

The JII 70 index comprised 130 companies during the period 2019 to 2022. Out of this number,

only 37 were registered on PROPER evaluation lists. In addition, the IDX 80 index encompassed 121 companies, of which only 29 were registered on PROPER. Therefore, the final sample consisted of

66 companies, with a total of 172 firm years. Table 2 shows the descriptive statistics for the total sample. Table 2 indicates that on average green accounting and green innovation were applied in only 60% and

67.5% of cases respectively. Carbon emissions disclosure had a value of 11.04 out of 18, equivalent to 61%, while eco-efficiency obtained a better result, reaching 73%.

Table 2. Descriptive statistics of the total sample

Indicator	Mean	Median	Min	Max
Green accounting	0.60	1.00	0.00	1.00
Eco efficiency	0.73	1.00	0.00	1.00
Green innovation	2.70	3.00	0.00	4.00
Carbon emissions disclosure	11.04	14.00	0.00	18.00
Environmental performance	2.74	3.00	0.00	5.00
Price to book value	2.97	1.34	0.00	60.67
Price earnings ratio	42.75	13.57	0.00	1336.48
Dividend payout ratio	40.39	35.27	0.00	177.44

In summary, the average implementation of green initiatives was at a moderate level of between 60 and 73%. These findings align with environmental performance indicated by the PROPER rankings, which obtained an average score of 2.7, indicating a tendency towards the "Blue" category (rank 3). The firms fulfilled the necessary environmental management requirements as

mandated by regulations but with a minimum level of compliance. This PROPER score is slightly lower than the 3.1 found by Juniarti et al. (2021), but similar to that of Meutia et al. (2019), who concluded that the average level of environmental performance of Indonesian companies remained relatively poor, reaching a level of only 33.75% according to Global Reporting Initiatives standards.

Table 3. Mean values of variables

Indicator	JII-70	IDX-80
Green accounting	0.66	0.62
Eco efficiency	0.72	0.78
Green innovation	2.70	2.87
Carbon emission disclosure	11.87	11.13
Environmental performance	2.74	3.04
Price to book value	3.28	3.66
Price earnings ratio	42.51	47.66
Dividend payout ratio	43.44	39.63

Tables 3 shows the mean values for each index. Overall, the levels of implementation of green initiatives are quite similar, between 60s-70s%. The JII-70 outperforms the IDX 80 in accounting and reporting, with an average green accounting score of 0.66 (compared to 0.62 for the IDX 80), with a carbon emissions disclosure score of 11.87 (compared to 11.13 for the IDX 80). Unfortunately, the JII 70 had an average environmental performance rating of only 2.74, lower than that of the IDX 80 (3.04), placing it in the red to blue range. This finding is inconsistent with Qizam et al. (2022),

who demonstrate that sharia issuers in Indonesia and Malaysia outperform general issuers in environmental and social performance.

Hypothesis testing

A variable is legitimate if its factor loading value is within the range of 0.5 - 0.6 (Ghozali & Latan, 2015). The outcomes of the initial testing show that the price earnings ratio (PER) had a factor loading of 0.181; therefore, it was removed from the model. Figure 2 shows the outcomes of the retesting after eliminating PER. All external loading values

exceeded 0.5. Carbon emissions disclosure had the greatest impact on explaining green initiatives, with a score of 0.913, followed by green accounting with a score of 0.851. These two indicators are mostly associated with documenting environmental expenses and disclosing environmental actions. There are two potential scenarios for this occurrence. First, carbon emissions disclosure indicators are comprehensive, consisting of 18 items, and which have been tested worldwide for their ability to

indicate carbon emission disclosure practices. Second, companies employ carbon emissions disclosure as camouflage in relation to the implementation of green programmes that are yet to be fully optimised, as demonstrated by Moneva et al. (2006). Reported and published information is much better than the actual conditions, it has faced criticism for its deficiencies in considering materiality aspects (Luque-Vílchez et al., 2023).

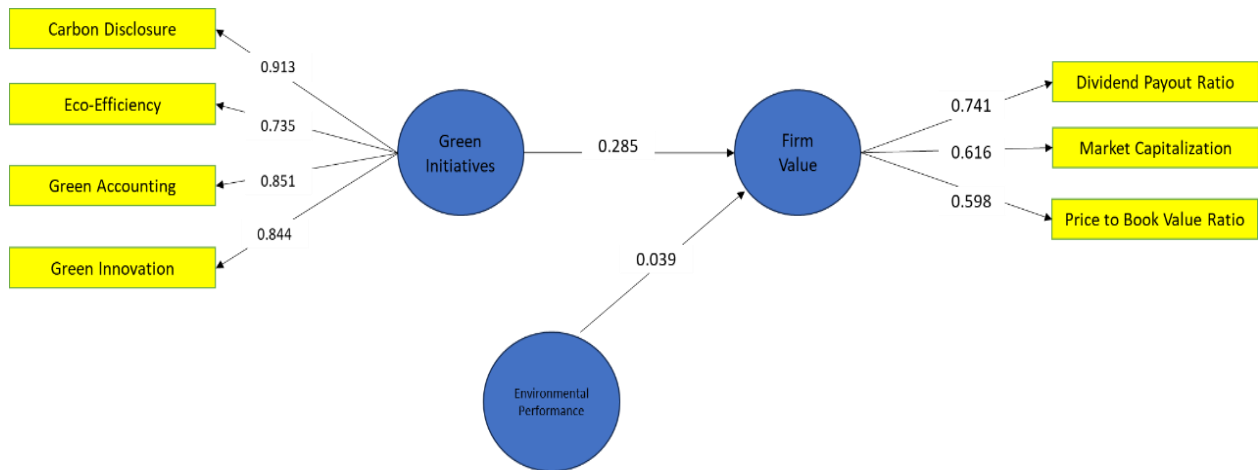


Figure 2. Final model for JII-70 and IDX-80 (correlation coefficients)

Firm value can be represented mostly by the dividend payout ratio, followed by the market capitalisation figure and the ratio of market and book values per share. According to Dunakhir (2023), these three indicators are reliable for measuring firm value. The R-squared value for all samples is 9%,

indicating a low level of explained variance. However, the research model successfully completed the outer model validity and reliability tests, suggesting that it fitted the necessary criteria for model applicability. The T-statistic values for the final model are displayed in Figure 3.

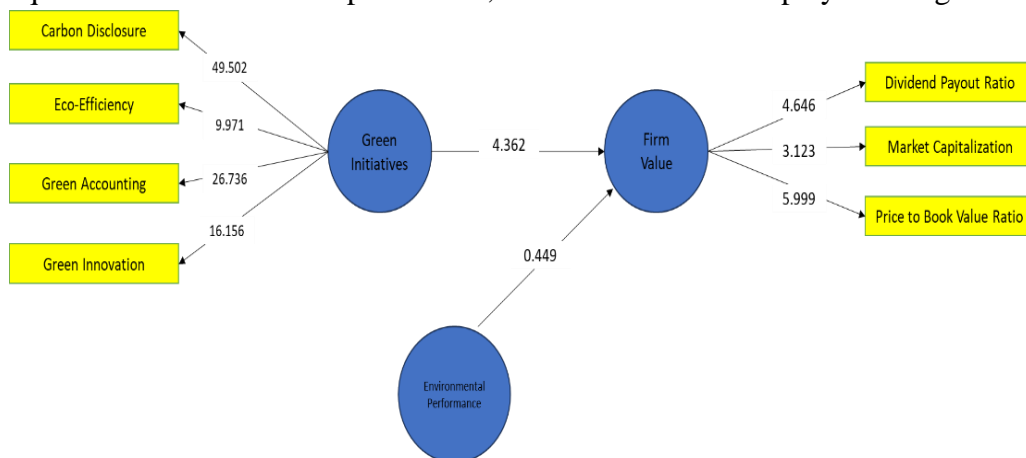


Figure 3. Final model for JII70 and IDX-80 (T-Statistics)

Table 4 displays the impact of green initiatives on firm value; it is significant, with a T statistical

value of 4.481, and a P value of 0.000. The coefficient has a positive direction (0.285),

indicating that as companies implement more green initiatives, their value increases. Therefore, Hypothesis 1 is confirmed. However, environmental performance has no significant impact as a moderating variable, as indicated by a T statistic of

0.114 and a P value of 0.909. Consequently, Hypothesis 2 is rejected. In addition, environmental performance as an independent variable does not have a significant direct impact on firm value (p value 0.704 > 0.05 and T value 0.381).

Table 4. Effect of each variable

	Original sample (O)	Sample mean (M)	Standard deviation (Stdev)	T statistics (o/Stdev)	P value
Environmental performance -> firm value	0.033	0.037	0.087	0.381	0.704
Green initiatives*environmental performance -> firm value	-0.011	-0.015	0.097	0.114	0.909
Green initiatives -> firm value	0.285	0.303	0.064	4.481	0.000

Effect of green initiatives on firm value

The findings demonstrate that green initiatives can effectively enhance firm value. Investors anticipate that embracing environmentally-friendly innovation in processes, goods, materials and packaging will lead to the long-term sustainability of businesses. Although this may not always provide immediate efficiency, it presents promising investment potential for the future. Xie et al. (2022) argue that green innovation, as measured by patents and environmental research and development, can be transformed into an intangible asset that generates future value. The positive response to green innovation by investors, as evidenced by Hao et al. (2022), will have a tangible effect in the subsequent 2-6 years. The implementation of environmentally-friendly practices in the Asean mining sector has been demonstrated to enhance its reputation and therefore boost market valuation (Dai & Xue, 2022; Yuniarti & Soewarno, 2022). This finding further supports those of Safitri and Nani (2021) and Sinkin et al. (2008), that enterprises implementing an eco-efficient strategy can lower expenses and enhance profits, making them highly esteemed in the market. To find a production process with optimal efficiency able to reduce environmental impacts, continuous research and development is needed.

The finding of the positive impact of green initiatives, as measured by green accounting and carbon emissions disclosure, on firm value supports previous studies (Alexander, 2023; Blesia et al.,

2023; Dianty, 2022; Han et al. 2023; Matsumura et al., 2014; Saka & Oshika, 2014; Sun et al., 2022). Acknowledging, assessing, and displaying expenses associated with environmental endeavours, such as contamination analysis, product recycling, waste management, upkeep of polluting machinery, or remediation of polluted waterways, are signals that companies are accountable and prioritise sustainability. These signals are promising for investors, indicating that their investments are robust (Alexander, 2023) and shielded from regulatory and public scrutiny. Investors should focus on the substance of carbon emissions disclosures, which include not only the methodology and disclosure regulations, but also the overall amount of gas emissions generated; a comparison of emissions across different years; the utilisation of renewable energy sources; and the targets for reducing emissions. The study conducted by Sukmadilaga et al. (2023) reveals that investors and creditors are becoming more cautious when evaluating green accounting disclosures. Investors can assess the specific environmental costs that are disclosed, including whether they are categorised as preventive, together with the detection costs or those resulting from environmental contamination or damage (internal or external failure). Companies that allocate a significant amount of their resources to preventive and detection expenses typically exhibit commendable environmental performance (Basuki & Irwanda, 2018).

As a robustness test, the study employed sub-sample testing by categorising the samples according to the JII-70 and IDX-80 indices, as shown in Figures 4 and 5. JII-70 exhibits distinct business attributes that include reduced risk owing to limitations on the level of interest-bearing debt, and the necessity for sharia issuers to generate interest revenue, as indicated by Laela et al. (2019). The model demonstrates the consistent and robust positive impact of green initiatives on firm value on

both indices. The correlation coefficient indicates that the impact of green initiatives on firm value is stronger on the IDX 80 Index (0.415) than the JII-70 (0.252). Preliminarily, this finding indicates that investors perceive green activities rationally. Their adoption attracted a more significant reaction in riskier companies, namely those listed on IDX-80 compared to JII-70. 15.6% of the variation in IDX-80 firm value can be explained by green initiatives, while on JII-70 it is only 8.8%.

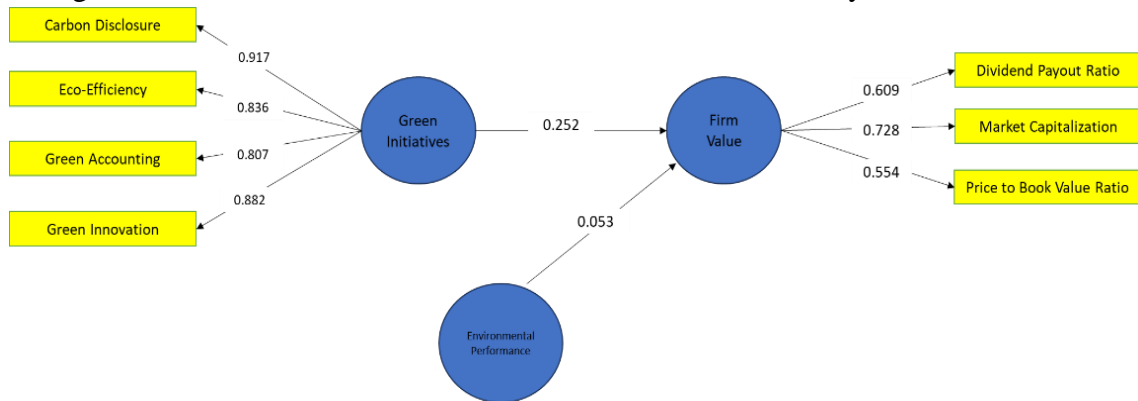


Figure 4. Final model JII-70 sample

The carbon emissions disclosure indicator consistently represents the green initiative on JII-70 and IDX-80, referred to as the outer model. However, there are variations in the other indicators. Specifically, on the JII-70 index, green innovation and eco-efficiency play a more significant role in explaining green initiatives, whereas the green accounting indicator has the lowest loading factor value (0.807). However, green accounting is the primary factor in describing green initiatives for

IDX-80, surpassing green innovation and eco-efficiency. Companies on JII-70 are projected to implement green initiatives with a focus on innovation and eco-efficiency. On the other hand, IDX-80 excels in terms of environmental reporting and accounting. When considering firm value, IDX-80 is mostly characterised by its dividend ratio, whereas JII-70 is primarily characterised by its market capitalisation value.

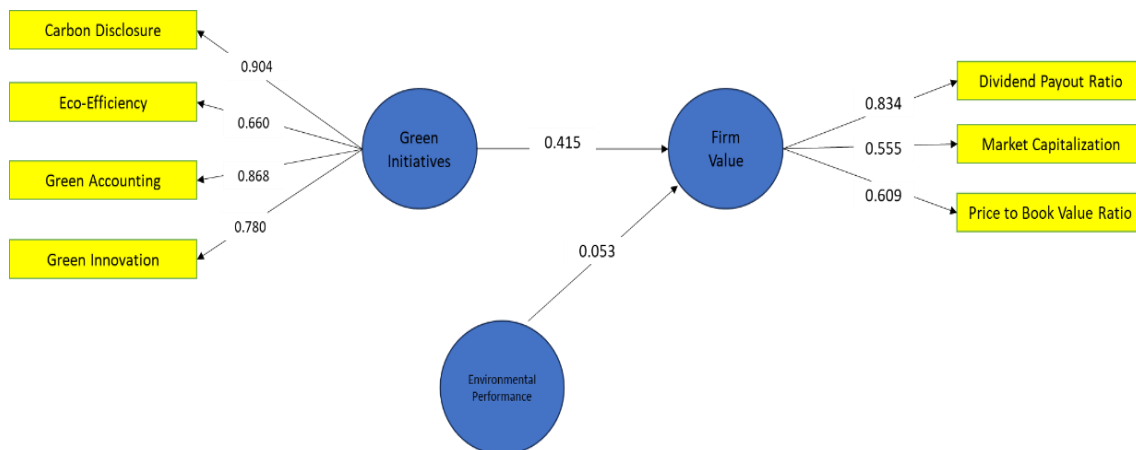


Figure 5. Final model IDX-80 sampl

It can be inferred that IDX-80 investors exhibit greater rationality and long-term focus, as evidenced by their emphasis on dividends. In contrast, JII-70 investors display more irrationality and short-term orientation, as reflected in their focus on share prices. This aligns with the findings of Makhruf et al. (2021). Sharia investors exhibit investment behaviour that is primarily influenced by psychological and religious factors, rather than rational understanding.

The moderating role of environmental performance

The related finding, which includes both the overall sample and sub-samples of the JII-70 and IDX-80 indices, indicates that the environmental performance variable does not have a moderating effect on the influence of green initiatives on firm value. There is also no evidence to support the direct impact of environmental performance on firm value. Hence, the environmental performance variable does not function as a moderating or independent variable. This corroborates the earlier study of Aprilina et al. (2022), but contradicts the findings of Hardiyansah and Agustini (2021), Pratiwi and Effendy (2023), and Kheireddine et al. (2023). The data do not support the moderation hypothesis for two main reasons. First, employing PROPER as an environmental performance metric may prove advantageous for businesses in adhering to environmental management regulations. However, it is worth noting that this assessment has not yet been acknowledged or considered by investors, particularly considering that foreign investors presently oversee 42% of Indonesian capital market assets. Nevertheless, the actual designation of this ESG score did not occur until December 2022.

Second, PROPER awards need to be followed up and monitored regularly to ensure they do not remain merely transient symbols. While this process necessitates the utilisation of combined resources and the cooperation of multiple entities, it primarily involves monitoring for the presence of a black or red awards; implementing an audit mechanism; and enforcing penalties accordingly.

5. Conclusions

This investigation has made two primary findings. First, green initiatives, as assessed by eco-efficiency, green innovation, green accounting, and carbon emission disclosure, have a positive impact on firm value. As a company increases its implementation of such initiatives, investors will assign a better valuation to it. This finding remains constant, regardless of whether is examined using the entire sample or subsets of the JII-70 and IDX-80 indices. While both green initiatives have a notable impact, the effect on firm value on IDX-80 is greater than on JII-70. Investors exhibit a favourable response to green initiatives, as seen by this positive impact. From an investor's perspective, investing in companies that adopt green initiatives is considered to be a secure investment that is shielded from regulatory and social pressures. Second, there is no conclusive evidence that environmental performance enhances the positive impact of green activities on firm value. PROPER awards may not have been seriously considered by investors.

This research has inherent limitations. First, although the 4-year research period adequately captures the trend of implementing green initiatives, due to the limited number of companies selected as the final sample based on specific criteria, the conclusion does not encompass the impact of green initiatives of all companies listed on the Indonesian capital market. Further studies could employ more extensive samples drawn from diverse indices, such as the Sri-Kehati index. Second, the utilisation of PROPER ratings restricts the sample size, as it excludes public enterprises that are not members of the PROPER programme. Subsequent studies could employ alternative measures, such as the ESG index. Third, the model is simple, as it solely incorporates the green initiative variable as an exogenous variable. Consequently, the R-squared value is rather low. Future studies should incorporate control factors that have consistently demonstrated their influence on firm value, such as size, profitability, and other financial aspects.

Regulators can infer from the findings of this research that rules effectively compel industries to adopt green initiatives; most are currently at a moderate level of adoption. Similarly, overall environmental management performance remains at a minimal level (blue). Therefore, legislation and monitoring systems for implementing these restrictions should be enhanced. The IDX needs to incorporate environmental compliance, such as a minimum ESG score in the JII 70 selection process. The Ministry of Environment and Forestry should also enhance the efficiency of the PROPER rating system by streamlining the rating process; providing a well-equipped audit team to cover all companies; and implementing a follow-up mechanism after the announcement of the ranking results. For industry, this research affirms that business objectives can be harmonised with social and environmental purposes. The industry can no longer contend that the implementation of green initiatives will diminish firm value.

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