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# Green Investing, Environmental Performance, and Firm Valuation: Evidence from Indonesia

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**Abstract:** This study investigates how green investing influences a firm environmental performance and eventually affects its financial valuation. Little research has addressed whether green investing can affect corporate environmental performance and how it influences the firm value, specifically when looking into its channels. Using companies listed on the Indonesia Stock Exchange from 2009 to 2021 and a pooled OLS on unbalanced panel data, our results suggest that green investing significantly enhances the company's environmental performance. The positive relationship between green investing and environmental performance is strengthened if the company is involved in social investment forums, while a firm with high shareholder protection weakens the positive relation. Further, the results show that environmental performance lowers the firm value. However, suppose firms focus on green innovation to develop and conduct eco-friendly research where economic value and environmental sustainability can be carried out simultaneously. In that case, it leads to higher firm financial performance. We extend the literature by contributing to the fields of investment management, innovation, and environmental literature by emphasizing financial logic that prioritizes the welfare of shareholders, which can be an important instrument to support the environmental logic of green investing.

**Keywords:** environmental performance, firm value, green innovation, green investing, shareholders protection.

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## INTRODUCTION

Green or environmentally friendly investment has garnered attention from public and private sectors across various countries (Lee & Lounsbury, 2015; Hall, 2016; Aragòn-Correa et al., 2020). Firm responsibility to be a green company could lead to a potential conflict between the main objectives of financial decisions and environmental sustainability. In other words, to maximise the firm value, manager's decisions are potentially threatening the sustainability of the environment and even human life. While studies find that maximising shareholder wealth leads to lower agency conflict (Ewelt-Knauer et al., 2015) this influences investors and managers to prioritise profits maximisation over sustainability orientation. This study aims to investigate whether green investment

drive environmental performance and influence the firm value. We also look into the impact of government's policy on shareholder protection and green forums influence on that relation.

Green investment is defined as investment made to reduce $CO^2$ emissions and air pollution but still generate profits for the company by lowering production costs (Chen & Golley, 2014; Khalil & Nimmanunta, 2021). Some companies consider green investment as a cost that can reduce profitability, and some consider green investment to be positively related to the company's long-term profits (Wang et al., 2022). Managing environmental conservation and protection for companies can be challenging due to the high cost of complying with regulatory requirements (Yan et al., 2021).

On the other hand, several previous studies found that the cost of investing in the environment can be a competitive advantage and a source of great performance with green innovation (Climent & Soriano, 2011). The concept of green investment is a social and moral responsibility of the company that allows it to align with shareholders' interests. Thus, preserving the environment can be in line with reducing costs while gaining a good reputation from the community and policymakers (Climent & Soriano, 2011; He & Feng, 2013). The proportion of green investment fund allocation can have a more significant impact on the company's performance. In other words, green investment can be expected to improve the company's environmental performance. Therefore, eco-friendly logic has become one of the main principles in our society.

Further this study identifies and analyse the channels through which green investments impact firm value. In the context of the Social Investment Forum, abbreviated as SIF, which was established by SRI (Socially Responsible Investing), it influence the green investment by giving them support for the social responsible investment logic (Revelli, 2017; Yan et al., 2021). A report from SIF states that 12.2% or at least one out of nine dollars of a firm managed by professional management in the U.S. involved in socially responsible investing (Hong & Kostovetsky, 2012; Gao & Zhang, 2015). SIF aims to coordinate financial, corporate and environmental stakeholders and gather influence, resources, information and expertise to increase the impact of green investment.

Previous research has shown that a company's strong commitment to corporate social responsibility (CSR), specifically environmental performance, can have positive impact on its financial performance (Iwata & Okada, 2011; Fatemi et al., 2018; Yoon et al., 2018; Ronald et al., 2019). This can improve relationship with stakeholders, indicating that the company's concern for the environment is very likely due to market mechanisms or market pressures without any intervention from the government. The company's environmental performance affect the company's financial performance either directly or indirectly. On the other hand, some studies suggest that running an environmentally friendly company reduces firm value (Di Giuli & Kostovetsky, 2014) and results vary according to the condition of the economy and industry.

Companies with good financial performance allocate their profits to research & development investments (hereafter R&D) to adopt technologies that increase efficiency and effectiveness. Investment in R&D can increase production efficiency and effective use of natural resource energy (Wu et al., 2020; Yan et al., 2021). Given the significant positive impact of innovation on profits and firm value (Zhang et al., 2014; Warusawitharana, 2015), conventional innovation can harm environmental quality due to the larger scale of production activities associated with profit-enhancing orientation and business expansion (Chen & Golley, 2014; Lee et al., 2015; Churchill et al., 2019; Paramati et al., 2021).

Several studies documented mixed results between R&D investment and firm value. R&D investment measures the intensity of conventional innovation (Khalil & Nimmanunta, 2021; Binh & Huong, 2022). R&D investment positively affects the company's financial performance (Churchill et al., 2019; Paramati et al., 2021) because R&D investment increases profitability and has a positive impact on overall performance in

the long term (Koussis & Makrominas, 2015; Warusawitharana, 2015). However, other research shows that companies with high innovation intensity lack transparency, which negatively impacts company performance (Honoré et al., 2015). Thus, this study suspects that the company's environmental performance influences the positive relation between conventional innovation and the company's financial performance.

In addition to conventional innovation, green innovation also impacts the company's financial performance, either increasing or decreasing (Zhang et al., 2019). The company will invest in environmentally friendly technology only if it makes a profit or if it could increase the company's long-term profit.

This research contributes to the fields of investment management, innovation, and environmental management literature. This study provides empirical evidence of whether there is congruence between the logic of environmental and financial performance. Environmental and financial logic may seem incompatible because they provide different measures, thus encouraging opposing practices in firms. However, a financial logic that prioritizes the welfare of shareholders can be an important instrument to support the environmental logic of green investing.

This study also contributes to policymakers by assessing the effectiveness of shareholder protection policies for the financial and environmental performance of companies. In this case, an effective environmental policy can be introduced as a good transition for the company to have good financial performance and be environmentally friendly. The government is the main actor in environmental conservation education for the community by preparing the right goals, resources, standards and policies. Third, this study can contribute to broader projects related to climate change that require real attention and action from stakeholders.

## METHODS

Using companies listed on the Indonesia Stock Exchange from 2009 to 2020, we test the hypothesis of this study. In 2006–2009 Indonesian companies that invested in green investing were 0.16 percent and increased in 2010–2013 to 0.31 percent (Yan et al., 2021). This number is still smaller than the average for other countries in the world, which is around 0.87 percent in 2006–2009 and decreased in 2010–2013 to 0.73 percent.

Company characteristics variables obtained from Thomson Reuters Refinitiv Eikon and the Indonesia Stock Exchange while country-level variables were retrieved from the World Bank, OECD, and Bloomberg. This green investment fund is shown openly to the public, and thus suitable with the purpose of this study is to analyse the normative influence of society. To reduce the effect of outlier and data bias, we performed a winzor of all continuous variables at the 1st and 99th percentiles.

This study divides the company's performance into two aspects, environmental and financial. Using the Thomson Reuters Refinitiv Eikon, we measure the environmental performance of each company. Thomson Reuters Refinitiv Eikon provides a standardised and globally comparable measure of a company's environmental performance across industries and countries (Ioannou & Serafeim, 2012). The Environmental Score covers three main sectors: emission reduction, environmental product innovation, and resource reduction. For the robustness test, we also apply other measurement methods for environmental performance. This study uses Tobin's Q to measure company performance as shown by Unsal et al. (2016). Tobin's Q (Q) is determined by adding up the market value of equity and book value of debt minus current assets divided by total capital.

Green investing measures the ratio of a firm's allocated funds with an explicit environmental mission to greater sustainability divided by the total amount of funds in Indonesia and then transforming it into logit. To test the robustness of this study using the logarithm of the percentage and the logarithm of the amount of green investing funds. This study uses a dummy variable denoted as 1 for a firm that engages in SIF at least once

a year, then 0 otherwise. This data was obtained first by looking for the existence of SIF online, then consulting with internal informants and various documents from SIF. The final method is to double-check historical web pages archived online. Prior research stated that SIF is concentrated in developed economies compared to developing countries (Yan et al., 2021).

Shareholder's protection law is the percentage of the independent board as a proxy. The seminal study found that shareholder protection law positively related to independent board (Kim et al., 2007) and avoiding opportunistic behaviour (Bebchuk & Hamdani, 2017). There is a positive relationship between the number of independent boards and firm value in countries with weak legal protection (Chou et al., 2016). In Indonesia, legal protection for minority shareholders is not specifically regulated in Law Number 8 of 1995 concerning the Capital Market (UUPM). On the other hand, legal protection for minority shareholders is regulated in Law Number 40 of 2007 regarding corporation (UUPT).

Conventional innovation is measured by calculating the ratio of the company's R&D investment divided by total assets (Nemlioglu & Mallick, 2017). The green innovation category score is obtained from the publication of Thomson Reuters Eikon which reflects the company's capacity to reduce costs and environmental burdens for its customers, to create new market opportunities through new environmentally friendly technologies and processes to produce eco-designed products.

Following prior studies, this study uses Tobin's Q to measure firm performance (Ng & Rezaee, 2015; Buchanan et al., 2018) . Tobin's Q calculates as the ratio of the market value of ordinary equity plus the book value of long-term debt and preferred equity to the book value of assets measured at the end of the fiscal year t. The market value of the company is calculated as the market value of ordinary equity plus the book value of the total debt.

At the company level, this study controls firm's characteristics such as: 1) leverage ratio, estimates the company's ability to pay off debts with equity. The leverage ratio can affect the company's environmental protection and preservation performance; 2) price to book ratio, estimating the potential value of the company, which can affect the commitment to non-financial performance in this case is the protection and preservation of the environment; 3) return on equity, because profitable firms are more likely to engage in pro-social activities; 4) firm size, as larger firms tend to be more visible and therefore tend to receive more pressure to improve their environmental record; 5) the relationship with green NGOs, a dummy variable indicating partnerships with environmental NGOs, because social movement organizations, such as environmental NGOs, are considered an important force in encouraging companies to become more responsible; 6) institutional ownership, because the percentage of shares owned by institutional investors has the potential to affect the company's environmental performance (Dyck et al., 2019); and 7) the environmental performance of the industry, proxied by the average environmental score of companies located in Indonesia within the same industry.

Data analysis in this study uses firm-level fixed-effects ordinary least-square regression with robust standard error. We also control for unobserved time or year invariant heterogeneity so that all cross-sectional data variations are absorbed by the constants. This study also takes into account other model approaches including the generalized least squared (GLS) model to overcome or correct autocorrelation and panel-specific heteroscedasticity (Cuervo-Cazurra & Dau, 2009).

## RESULTS AND DISCUSSION

This research conducted in Indonesia for firms listed on the Indonesia Stock Exchange (IDX) from various industries. Companies that do not publish environmental score are excluded from the sample.

Table 1 presents a statistic summary of the sample. The average level of the Environmental Score variable is 32,298 with a relatively high standard deviation of 24.6 it means environmental score of the sample has a high degree of variation. The proportion of green investment at the average level is 20.63. In other words, on average, 5 percent of the investment funds in our sample are considered "green investments".

**Table 1 Descriptive Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Environmental Score | 379 | 32.298 | 24.6 | 0 | 90.113 |
| Green Investing | 97 | 20.63 | 3.762 | 13.478 | 26.41 |
| leverage | 10062 | .28 | .309 | 0 | 1.989 |
| Price to Book | 7716 | 2.296 | 3.962 | -2.306 | 28.678 |
| green partner | 10350 | .98 | .14 | 0 | 1 |
| size | 10062 | 26.59 | 3.58 | 17.108 | 32.842 |
| ROA | 10040 | .022 | .115 | -.579 | .361 |
| Industry inv | 7108 | .128 | .336 | 0 | 2.21 |
| Innovation_green | 375 | 14.155 | 26.122 | 0 | 92.391 |
| ROE | 10040 | .08 | .371 | -1.674 | 1.757 |
| Tobin's q | 8539 | 323.34 | 802.385 | .127 | 2506.721 |
| Conventional | 419 | .004 | .008 | 0 | .073 |
| Independent director | 373 | 43.467 | 14.862 | 14.286 | 100 |
| Forum | 332 | .572 | .495 | 0 | 1 |

source: Data processed (2022)

Table 2 presents the correlations between all the variables involved in this study. As expected, there is a significant correlation between Green Investing and Environmental Score. In addition, the highest correlation is between green innovation and firm value as measured by Tobin's Q. This shows that an increase in firm value goes hand in hand with an increase in the firm's Green Innovation. The following are labels from Table 2 where 1) Environmental Score; 2) Green Investing; 3) Leverage; 4) Price to Book Ratio; 5) Green_Partner; 6) Size; 7) ROA; 8)Industry_Investment; 9) ROE; 10) Tobin's Q; 11) Conventional; 12) Green_Innovation; 13) Independent Director; 14) Forum of Social Investment (FIS).

Table 3 presents the results of the OLS regression of industry-year fixed effects and the relationship between Green investment and environmental scores in various industries in different years. Profitable companies tend to have a better level of corporate environmental performance. Model 1 in Table 3 is the result of the Green Investing regression on the Environmental Score (Envi_score) involving the control variable in the model to test relationship between the proportion of funds for green investment and firm's environmental performance. Size coefficient is negative and statistically significant, indicating that large companies are not to be associated with high score of environmental performance.

**Table 2 Pariwise Correlation between variables**

| Var | (1) | (2) | (3) | (4) | (5) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (2) | 0.029 | 1.000 | | | | | | | | | | | | |
| (3) | -0.207 | -0.144 | 1.000 | | | | | | | | | | | |
| (4) | 0.088 | 0.229 | -0.070 | 1.000 | | | | | | | | | | |
| (5) | 0.493 | 0.367 | 0.019 | -0.061 | 1.000 | | | | | | | | | |
| (6) | -0.284 | 0.690 | -0.122 | 0.035 | -0.128 | 1.000 | | | | | | | | |
| (7) | 0.065 | 0.205 | -0.323 | 0.194 | -0.082 | 0.104 | 1.000 | | | | | | | |
| (8) | 0.184 | -0.017 | -0.033 | 0.039 | -0.095 | -0.063 | 0.004 | 1.000 | | | | | | |
| (9) | 0.090 | -0.065 | -0.011 | 0.147 | -0.049 | 0.034 | 0.297 | -0.006 | 1.000 | | | | | |
| (10) | 0.320 | -0.741 | 0.058 | -0.012 | -0.011 | 0.819 | 0.008 | 0.171 | -0.002 | 1.000 | | | | |
| (11) | -0.248 | -0.245 | -0.198 | 0.094 | 0.079 | 0.017 | 0.247 | -0.011 | 0.097 | -0.086 | 1.000 | | | |
| (12) | 0.530 | -0.091 | -0.148 | 0.273 | 0.358 | 0.108 | 0.113 | 0.055 | 0.232 | -0.063 | -0.248 | 1.000 | | |
| (13) | -0.041 | 0.192 | -0.106 | 0.285 | -0.056 | 0.303 | 0.068 | -0.013 | 0.218 | -0.279 | -0.129 | 0.185 | 1.00 | |
| (14) | 0.292 | 0.272 | -0.008 | -0.291 | 0.321 | 0.146 | -0.228 | 0.097 | -0.145 | -0.088 | -0.642 | 0.151 | -0.182 | |

source: Data processed (2022)

The firm's ROE in model 2 shows a positive relationship to the environmental performance. The positive sign in the regression coefficient indicates that companies with high return on equity (ROE) invested by investors generally excel in environmental performance. The coefficient for ROA is negative and statistically significant

with an alpha of 5% in model 2, indicating that profitable companies on average are less environmentally friendly. This is interesting because ROA and ROE show different results even though they are both measures of the rate of return on investment. The firm size coefficient is negative and statistically significant with an alpha of 5%, indicating that larger firms tend to have a lower level of corporate environmental performance.

**Tabel 3 Regression results of Fixed Effect baseline model**

| VARIABLES | Envi_score (1) | Envi_score (2) | Envi_score (3) | Envi_score (4) |
|---|---|---|---|---|
| Green_investing | 0.051*** | 0.025* | -0.093 | 0.013 |
| | (3.05) | (1.94) | (-0.08) | (0.01) |
| GreenXForum | | | 3.865** | 2.425** |
| | | | (2.57) | (2.37) |
| Forum | | | -61.989** | -35.930 |
| | | | (-2.36) | (-1.51) |
| Leverage | -0.030 | -0.246 | -29.792** | -51.808*** |
| | (-0.18) | (-1.55) | (-2.23) | (-4.83) |
| Price to Book | -0.178*** | -0.142*** | -8.244*** | -1.588 |
| | (-3.26) | (-3.06) | (-2.98) | (-0.64) |
| Partner_green | 0.018 | 0.128 | -3.891 | -2.719 |
| | (0.20) | (1.61) | (-0.64) | (-0.26) |
| Size | -0.052*** | -0.017 | -2.713** | -1.151 |
| | (-3.21) | (-1.50) | (-2.49) | (-1.06) |
| ROA | -0.004 | -0.015** | -0.259 | -1.807*** |
| | (-0.48) | (-2.27) | (-0.40) | (-3.60) |
| Industry_invest | -0.106* | -0.122** | -1.594 | -2.593 |
| | (-1.82) | (-2.53) | (-0.27) | (-0.66) |
| ROE | 0.010** | 0.009** | 0.749** | 0.547** |
| | (2.49) | (2.08) | (2.40) | (2.30) |
| Constant | 1.470*** | 1.119*** | 129.025*** | 102.111*** |
| | (7.65) | (7.44) | (5.31) | (5.07) |
| Observations | 73 | 73 | 67 | 67 |
| Adjusted R-squared | 0.452 | 0.679 | 0.264 | 0.626 |
| Year FE | YES | YES | YES | YES |
| Industry FE | NO | YES | NO | YES |

Source: data processed (2022)

The relation with green NGOs also shows a positive relationship to the company's environmental performance although it statistically insignificant. This relationship shows the positive role of social pressure in improving the company's environmental performance although it has not been significantly influential. Model (1)-(2) in

Table 3 shows the positive relation between green investing and the company's environmental performance is significant at the 1% alpha level. The results are consistent after including year and industry fixed effect at 10% alpha. An increase of one standard deviation in the share of green investment is associated with an increase in the company's environmental score of 1.25 (= 0.051*24.6).

Models (3) and (4) are the results of the OLS shows the interaction between social investment forum (Forum) and the proportion of green investment is statistically significant at the alpha level of 5%. These results support hypothesis that the relationship between green investing and environmental performance scores is stronger if companies involved in social investment forums at least once a year. Results remain consistent in model 4 with year and industry fixed effects. The statistical results show a stronger level of significance and a larger magnitude.

Model 1 Table 4 provides test results for relation between shareholder protection laws and the firm's environmental performance. The coefficient of shareholder protection law (ID_high) is negative and statistically significant at 1% alpha. Shareholder protection is measured by the proportion of independent directors on the board of directors who have a supervisory and monitoring role. Model (1) and (2) show that a strong shareholder protection with a high proportion of independent directors reduces the company's environmental performance. These results are supported by research conducted by Yan et al. (2021) that found the shareholder protection policy has a negative relationship with the company's environmental performance. In line with Liang & Renneboog (2017) found countries that have better shareholder protection, have lower social and environmental performance.

The regression results from the model (3)–(4) Table 4 show that when the company is strict in the implementation of shareholder protection but also invests in environmentally friendly technology, it does not have an impact on the company's environmental performance. These results support the main principle of financial managers, maximizing shareholder value (Jensen & Meckling, 1976; Jensen, 2002) which can reduce investor and public concerns in investing (Guillén & Capron, 2016).

In the model (1)–(2) of Table 5 show that environmental performance reduces the company's financial performance. This is in line with the results of previous studies that environmentally friendly companies are expensive and will reduce company future profits (Di Giuli & Kostovetsky, 2014).

Models (3)–(4) of Table 5 show that conventional innovation is negatively correlated with the company's environmental performance. This result is in line with previous research that conventional innovation with R&D lowers environmental performance. Conventional innovation, which is sensitive to the environment can have a negative impact on environmental quality due to the larger scale of production activities related to the orientation of increasing profits and business expansion (Chen & Golley, 2014; Lee et al., 2015; Churchill et al., 2019; Paramati et al., 2021). Conventional innovation as measured by the ratio of R&D costs has a negative relation and statistically significant at 1% alpha on the firm's environmental performance. These results show conventional innovation reduce the company's environmental performance. Conventional innovation affects the environment and reduce the quality of a firm's environmental performance because R&D or conventional innovation is only related to non-green activities that are oriented towards profit and business expansion (Chen & Golley, 2014; Lee et al., 2015; Churchill et al., 2019; Paramati et al., 2021).

The next analysis is to investigate the green innovation carried out by the company and its effect on the company's financial performance. Testing this hypothesis will be interesting considering that many companies do not only focus on conventional innovation but switch to be greener in innovation. We concern on the firm's

financial performance improvement when the company develops and conducts eco-friendly research where economic value and environmental sustainability can be carried out simultaneously. In Table 5 model (5)–(8) large companies have lower financial performance/firm value compared to small companies.

**Table 4 Regression of Shareholder protection law on environmental performance**

| VARIABLES | Envi_score (1) | Envi_score (2) | Envi_score (3) | Envi_score (4) |
|---|---|---|---|---|
| ID_high | -5.790** | -5.263*** | 10.006 | 10.189 |
| | (-2.42) | (-2.95) | (0.34) | (0.40) |
| GreenXID_high | | | -0.717 | -0.454 |
| | | | (-0.50) | (-0.39) |
| Green_investing | | | 2.500* | 0.806 |
| | | | (1.89) | (0.70) |
| Leverage | -13.484** | -23.088*** | -23.801 | -46.984*** |
| | (-2.00) | (-4.18) | (-1.47) | (-4.27) |
| Price to Book | 0.707** | -0.405** | -7.323** | -1.577 |
| | (2.25) | (-2.23) | (-2.43) | (-0.60) |
| Partner_green | 21.326*** | 14.201*** | 0.804 | 7.829 |
| | (8.83) | (6.75) | (0.13) | (0.90) |
| Size | -2.318*** | -0.342 | -2.206* | -0.318 |
| | (-6.96) | (-0.99) | (-1.92) | (-0.37) |
| ROA | | -0.072 | | -1.888*** |
| | | (-0.77) | | (-3.70) |
| Industry_invest | 8.839*** | -2.892 | 1.708 | -0.542 |
| | (2.65) | (-1.30) | (0.29) | (-0.14) |
| ROE | | -0.009** | | 0.537** |
| | | (-2.12) | | (2.23) |
| Constant | 90.781*** | 47.251*** | 74.418*** | 69.047*** |
| | (8.68) | (4.69) | (5.38) | (5.34) |
| Observations | 312 | 312 | 67 | 67 |
| Adjusted R-squared | 0.384 | 0.735 | 0.172 | 0.584 |
| Year FE | YES | YES | YES | YES |
| Industry FE | NO | YES | NO | YES |

Source: data processed (2022)

**Table 5 Fixed Effect Regression on Firm Value**

| VARIABLES | (1) Tobinsq | (2) Tobinsq | (3) Envi_score | (4) Envi_score | (5) Tobinsq | (6) Tobinsq | (7) Tobinsq | (8) Tobinsq |
|---|---|---|---|---|---|---|---|---|
| Envi_score | -366.724*** | -357.443*** | | | | | | |
| | (-7.27) | (-8.29) | | | | | | |
| Conventional | | | -0.087*** | -0.097*** | 97.444** | 111.510*** | | |
| | | | (-2.85) | (-3.22) | (2.45) | (2.74) | | |
| Innovation_green | | | | | | | 1.659*** | 2.335*** |
| | | | | | | | (2.99) | (3.24) |
| Leverage | 21.730 | 12.082 | 0.001 | -0.030 | -290.848** | -273.363** | -11.565 | -329.723 |
| | (0.63) | (0.36) | (0.02) | (-0.68) | (-2.56) | (-2.53) | (-0.06) | (-1.39) |
| Price to Book | -1.368 | -2.942** | -0.011** | -0.009** | -10.992 | -9.143 | -4.451 | -1.158 |
| | (-0.90) | (-2.02) | (-2.58) | (-2.47) | (-1.51) | (-1.40) | (-0.86) | (-0.32) |
| Partner_green | -312.734*** | -227.483*** | 0.446*** | 0.475*** | -340.066*** | -357.514*** | 90.681*** | 54.315* |
| | (-5.32) | (-4.39) | (4.13) | (4.55) | (-7.29) | (-6.71) | (2.91) | (1.67) |
| Size | -212.685*** | -205.827*** | -0.007** | -0.007 | -228.510*** | -227.949*** | -246.988*** | -260.177*** |
| | (-92.33) | (-82.09) | (-2.11) | (-1.65) | (-23.21) | (-23.56) | (-41.88) | (-61.68) |
| ROA | 0.324 | 0.266 | -0.000 | 0.003 | -12.244*** | -12.347*** | -6.045* | -2.806 |
| | (0.60) | (0.53) | (-0.20) | (0.64) | (-3.33) | (-3.15) | (-1.75) | (-1.33) |
| Industry_invest | 126.009*** | -17.129 | -0.005 | -0.026 | 28.624 | 28.543 | 42.900 | 66.938 |
| | (5.71) | (-0.74) | (-0.19) | (-0.89) | (0.32) | (0.32) | (1.10) | (1.60) |
| ROE | 0.004*** | 0.006*** | -0.001 | -0.002 | 4.440** | 5.562*** | 0.064 | 0.169 |
| | (11.64) | (14.83) | (-0.95) | (-1.28) | (2.22) | (2.76) | (0.26) | (1.03) |
| Constant | 6,704.593*** | 6,454.554*** | 0.804*** | 0.762*** | 7,183.050*** | 7,149.766*** | 7,742.256*** | 8,133.519*** |
| | (88.14) | (82.64) | (5.59) | (4.51) | (24.42) | (24.43) | (45.16) | (55.31) |
| Observations | 5,020 | 4,994 | 292 | 286 | 286 | 286 | 308 | 308 |
| Adjusted R-squared | 0.761 | 0.784 | 0.316 | 0.376 | 0.895 | 0.895 | 0.922 | 0.947 |
| Year FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Industry FE | NO | YES | NO | YES | NO | YES | NO | YES |

Source: data processed (2022)

Model (7)–(8) of Table 5 exhibit the coefficient of green innovation (Innovation_green) is positive and statistically significant at the 1% level. Consistent results are shown in model (8) with fixed effects on year and industry. This fixed effect test is important because each sample of this study has high industry variability and some companies do not disclose a green innovation score in the year of observation in the sample.

Our results supports stakeholder theory and prior study that green innovation is positively correlated with firm value (Cheng et al., 2014; Khalil & Nimmanunta, 2021). Thus, green innovation where companies are able to produce efficiently but environmentally friendly (Ong et al., 2020), it increases firm's financial performance by providing competitive advantages such as production cost efficiency, more innovative products and reduced operating costs (Ong et al., 2019). These results also support prior studies that found green innovation increase reputation and legitimacy by differentiating themselves from potential competitors, thereby increasing their value and revenue (Darnal et al., 2012). The results of this study emphasises that companies have to carry out R&D and environmental friendly procedures together to be green innovated which ultimately lead to increased firm value.

We ran robustness test to see whether the results stay remain the same by adding variable age of the company (firm age), and the quality of corporate governance are factors that influence and determine firm value. Firm age is a natural logarithm from the year the company was found. The older the age of the company, the more difficult it is to adapt to changing issues that are very likely to reduce the company's performance (Aouadi & Marsat, 2018). Likewise, the performance of corporate governance influences the company's environmental and financial performance. Table 6 is regression results for robustness check where the results obtained remain consistent as before.

**Table 6 Robustness Check for Baseline Model**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **VARIABLES** | **Envi_score** | **Envi_score** | **Tobinsq** | **tobinsq** |
| Envi_Score | | | 192.608** | 192.608* |
| | | | (2.02) | (1.69) |
| Green_investing | 22.098*** | 12.254*** | -39.595*** | -39.595*** |
| | (7.27) | (5.14) | (-2.88) | (-2.71) |
| GovernancePillarScore | 0.201*** | 0.187*** | -0.350 | -0.350 |
| | (4.12) | (4.60) | (-0.24) | (-0.18) |
| Firm Age | -11.105 | -48.065*** | 75.941 | 75.941 |
| | (-0.72) | (-2.77) | (0.09) | (0.10) |
| Control Variables | YES | YES | YES | YES |
| Observations | 315 | 315 | 67 | 67 |
| Adjusted R-squared | 0.542 | 0.786 | 0.963 | 0.963 |
| Year FE | YES | YES | YES | YES |
| Industry FE | NO | YES | NO | YES |

Source: data processed (2022)

## CONCLUSIONS

This research contributes to a broader institutional theory development project by providing empirical results in addressing the huge challenge of climate change, which requires coordinated action from numerous stakeholders. This research gives us understanding the effects and effective solution of climate change on society. This study finds such an important solution by confronting the environmental consequences of green investments and their relationship to long term firm financial performance. The main result of this study found that green investing can improve the company's environmental performance where the positive relationship is strengthened if the company is involved in social investment forums. However, better environmental performance lowers the long-term financial performance. Interestingly, if the firm focus on green innovation to develop and conduct eco-friendly research where economic value and environmental sustainability can be carried out simultaneously, it will lead to higher firm financial performance. Suggestions from this study are the limited data that can be accessed and the availability of information in the company's policies in its environmental performance to rigorously test the larger questions with appropriate methodological analysis. However, the focus on green investment and environmental performance as well as corporate financial performance has the urgency of answering these questions, thus challenging researchers to contribute with ideas and empirical evidence to change institutions in Indonesia to address the climate crisis.

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