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Carbon emission disclosure and PROPER: Are they attractive to foreign investors?

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ABSTRACT

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This study examines the effect of carbon emission disclosure and the Public Disclosure Program for Environmental Compliance (PROPER) on foreign ownership of manufacturing companies in Indonesia from 2018 to 2022 that publish annual reports or sustainability reports, registered with the Ministry of Environment and Forestry PROPER, and carbon emissions disclosure in the annual report and/or sustainability report. The analysis method uses the ordinary least squared (OLS) approach to study 28 PROPER manufacturing companies used as samples. The control variable used is return on equity (ROE), this is based on the idea that foreign investors are willing to invest in other countries to get a return on the equity or capital channeled to the company. The results show that carbon emissions disclosure has a significant positive effect on foreign ownership. Conversely, PROPER did not have any significant positive effect on foreign ownership. The results show interesting results that foreign investors are proven to consider environmental aspects in making decisions to invest in companies in Indonesia. On the other hand, the Indonesian government needs to ensure that its PROPER ratings can also provide benefits to foreign investors to attract their investment decisions.

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1. Introduction

Foreign direct investment (FDI) in a country is seen to accelerate economic growth and exports through improving capital markets, better access to advanced technology, and developing the skills of workers and managers in the country (Brada et al., 2021). Fig. 1 shows that FDI in Indonesia is in a fairly good position, namely in 6th. However, it is still far away compared to FDI in other countries such as China, Singapore, Hong Kong, Australia, and Japan. The amount of FDI still far from other countries needs to be a concern for the state or company management to increase the attractiveness of companies to develop company performance and face competition in domestic and global markets.

In the context of equity participation or foreign ownership of companies in Indonesia, the management of domestic companies needs to know and increase the attractiveness to attract foreign investors in equity participation. Thus, there is a need for a more in-depth study and expanded insight into what can influence funding from foreign investors to enter domestic companies. Researchers propose research from a different perspective, namely: the social and environmental angle as a factor that increases foreign ownership of companies in Indonesia. Social responsibility is not only a philanthropic activity but also discusses the organization's efforts to contribute to sustainability. Social responsibility also provides signals (in this case to foreign investors) regarding the organization's legal and ethical commitments, as well as the organization's ability to provide proactive solutions to challenges faced in social and environmental issues (Widianingsih et al., 2022).

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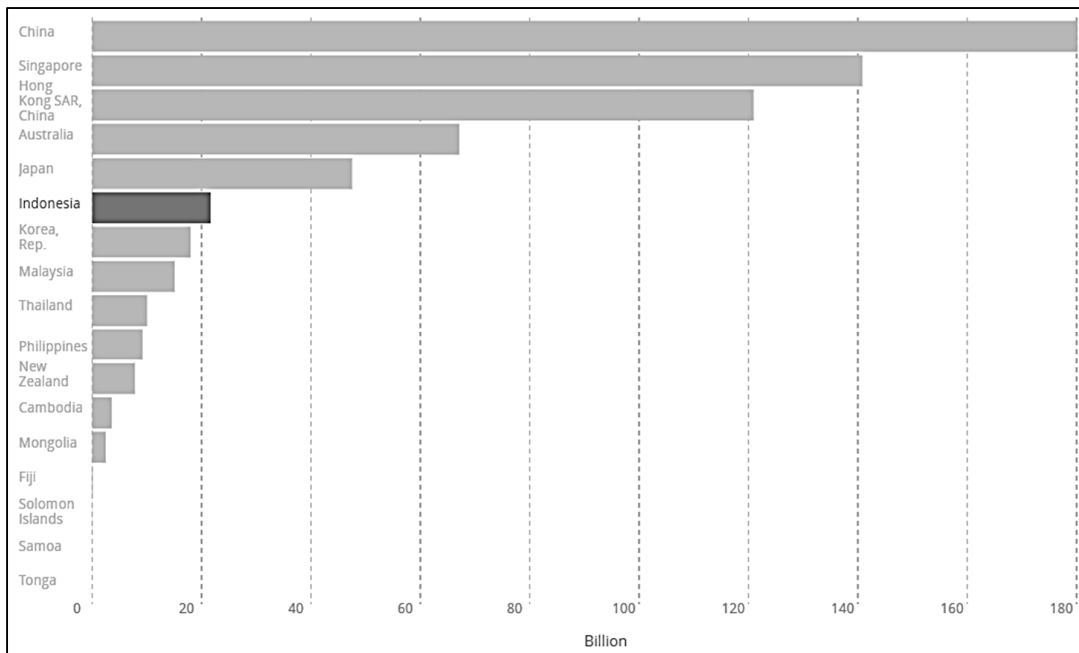


Fig. 1. Foreign Direct Investment (FDI) in Asia
Source: World Bank Group, 2021

Foreign investors are geographically separated from the companies in which they invest their funds, so foreign investors have limitations in obtaining information. Voluntary disclosure is one way for companies to convey information (Kim et al., 2021). Environmental issues are important issues so domestic companies voluntarily provide information related to the environment, one of which is carbon emission disclosure (CED). Companies that do not disclose information about carbon emissions can potentially give negative signals to investors that can harm the company (Kim et al., 2021), or make foreign investors not interested in investing in the company. Thus, the signals provided by companies through carbon emission disclosure can potentially attract the attention of foreign investors to fund domestic companies. However, there is still no research that examines this issue.

The government seeks to improve the environmental performance of companies, including domestic companies. One of the policies implemented by the government is through the Public Disclosure Program for Environmental Compliance (PROPER), the government expects businesses to follow the laws and regulations that have been set. PROPER can represent transparency from companies for environmental management (Novitasari & Tarigan, 2022). PROPER ratings can potentially provide signals for foreign investors to show the extent to which companies are environmentally friendly so that foreign investors are potentially interested in owning or increasing company ownership in Indonesia.

Signals delivered by management are more credible and trustworthy without cost, as stated in the literature on voluntary disclosure, credible disclosure is the choice of management to eliminate information asymmetry (Kumar et al., 2017). Companies with superior sustainability performance tend to disclose high-quality sustainability to signal superior sustainability performance, in line with signaling theory or voluntary disclosure theory (Rezaee & Tuo, 2017). Voluntary disclosure submitted by domestic company management shows foreign investors that the company is superior so that it can attract the attention of foreign investors.

Academics have conducted studies on several factors that can attract foreign investors to invest in Indonesia. One study states that technology owned by domestic companies can attract foreign investors to invest in companies in a country (Yu, 2018). Natural and mineral resources, a relatively large domestic market, can also potentially influence investment decisions in Africa (Asiamah et al., 2019). Another study states that foreign investors prefer to invest in companies that can show more accounting comparability while accounting comparability itself is lower for domestic mutual fund holdings (Chauhan & Kumar, 2019). Other things that cause foreign investors to consider whether to continue investing in a company are sales revenue and parent company (Lee & Kang, 2023). Almost all previous studies have focused on the materialistic or economic benefits compared to the social side, while the researcher believes that today's world investors are more sensitive to sustainability issues related to the environment as one of the considerations for investing in the company.

The importance of foreign ownership in a company as well as the gap from previous studies attracts researchers to contribute and fill the research gap. The researcher proposes a different model by involving environmental issues, namely: carbon emission disclosure and the Public Disclosure Program for Environmental Compliance (PROPER) as potential attractions that

can attract and increase foreign ownership in companies in Indonesia. To the best of the researcher's knowledge, no research examines the effect of carbon emission disclosure and PROPER on foreign ownership of companies in Indonesia.

2. Materials

2.1 Signaling Theory

Signaling theory suggests that management conveys value-relevant information to meet investors' need for information (Wang & Hussainey, 2013). Signals delivered by management are more credible and trustworthy without cost, as stated in the literature on voluntary disclosure, credible disclosure is the choice of management to eliminate information asymmetry (Kumar et al., 2017). Companies with superior sustainability performance tend to disclose high-quality sustainability to signal that superior sustainability performance is in line with signaling theory or voluntary disclosure theory (Rezaee & Tuo, 2017). Voluntary disclosure submitted by domestic company management shows foreign investors that the company is superior so that it can attract the attention of foreign investors.

This study uses the signaling theory approach because carbon emission disclosure and PROPER are seen as signals to show the company's credibility in environmentally friendly aspects. It is expected that the carbon emission disclosure and PROPER signals conveyed by the company can reduce information asymmetry and get a positive response from foreign investors in the form of ownership.

2.2 Effect of Carbon Emission Disclosure on Foreign Ownership

Green investment is one of the increasingly popular topics in this era, investors who focus on green investment always strive to reduce the level of carbon emissions in the short and long term to encourage green growth (Zhou et al., 2022). Investors, in this case, foreign investors, need a medium to signal that domestic companies targeted for investment have implemented and committed to reducing carbon emissions. One of the media that bridges information between companies and foreign investors regarding carbon emission information is carbon emission disclosure: carbon emission disclosure, which is still voluntary. Foreign investors invest their funds in companies that are highly transparent to reduce information asymmetry or information imbalance (Kim et al., 2021). Thus, researchers can conclude that foreign investors consider carbon disclosure in making investment decisions, so the proposed hypothesis is:

H₁: *Carbon emission disclosure has a significant positive effect on foreign ownership of companies in Indonesia.*

2.3 Effect of PROPER on Foreign Ownership

Furthermore, foreign investors may receive signals from companies through ratings provided by the Indonesian government in the form of the Public Disclosure Program for Environmental Compliance (PROPER). PROPER ratings can show the transparency delivered by companies in environmental management (Novitasari & Tarigan, 2022). In addition, the application of the instruments is an effort of the Ministry of Environment to implement the principles of good governance consisting of: "transparency, fairness, accountability, and community involvement" in environmental management. PROPER ratings are provided by the Ministry of Environment and Forestry, a rating provided by a credible institution should be a signal for foreign investors to invest in domestic companies in Indonesia. Thus, in line with hypothesis 1, the proposed hypothesis is:

H₂: *PROPER has a significant positive effect on foreign ownership of companies in Indonesia.*

3. Methods

3.1 Sample

The sample is a manufacturing company listed on the Indonesia Stock Exchange (IDX) from 2018 to 2022 with sample criteria: publish annual reports and/or sustainability reports, registered with the Ministry of Environment and Forestry's PROPER, and the company explicitly disclose carbon emissions (at least one carbon emissions disclosure item) in the annual report and/or sustainability report.

3.2 Measurement Variable and Analysis

The tests carried out in this study used the ordinary least-squared (OLS) approach. The data used in this study were 28 PROPER companies from 2018 to 2022. The model used in this study is as follows:

$$FO = \alpha + \beta_1 CED + \beta_2 PROPER + \beta_3 ROE + \varepsilon \quad (1)$$

Description:

FO = Foreign Ownership

CED = Carbon Emission Disclosure

PROPER = Public Disclosure Program for Environmental Compliance.

ROE = Return on Equity

Model 1 shows that the dependent variable of the model used is foreign ownership, then the independent variables used are carbon emission disclosure (CED), and the Public Disclosure Program for Environmental Compliance (PROPER). The control variable used in research model (1) is: return on equity (ROE), this is based on the idea that foreign investors are willing to invest in other countries to get a return on the equity or capital channeled to the company. The measurement of carbon emission disclosure uses an index developed by Choi et al. (2013) called the Carbon Disclosure Project (CDP) in the form of a checklist (18 disclosure items).

Table 1
Measurement Variables

Variables	Measurements
Carbon Emission Disclosure (CED)	$\frac{\text{Total items disclosed}}{18} \times 100\%$
Public Disclosure Program for Environmental Compliance (PROPER)	PROPER rating: Gold (very good) = 5 Green (good) = 4 Blue (enough) = 3 Red (bad) = 2 Black (very bad) = 1
Foreign Ownership (FO)	$\frac{\text{Foreign-owned shares}}{\text{Total shares outstanding}} \times 100\%$
Return on Equity (ROE)*	$\frac{\text{net profit after tax}}{\text{shareholders' equity}} \times 100\%$

*As a control variable

Source: Processed Data (2023)

Before testing the hypothesis, researchers conducted an error normality test using the Skewness/Kurtosis test for Normality, a multicollinearity test using the variance inflation factor (VIF) approach, and heteroscedasticity test can be detected and resolved with the robust standard errors approach (Hoechle, 2007; Kohardinata et al., 2020).

4. Results

4.1 Descriptive Statistics

The results of this study are preceded by the presentation of descriptive statistics listed in Table 2 with a total of 108 observations after eliminating outlier errors. The results of the descriptive statistics in Table 2 show that the foreign ownership variable (FO) has a distribution from a value of 0 to 93.1 with an average of 34.8944 with a standard deviation of 29.99881. The average value of carbon emission disclosure (CED) is 13.42778, standard deviation of 8.76257 with a range of values from 5.56 to 38.68. On average, few manufacturing companies disclose their carbon emissions, disclosing only 2 to 3 items out of a total of 18 disclosure items. The highest disclosure of sample companies is still at 7 items only. Public Disclosure Program for Environmental Compliance (PROPER) shows an average of 3.111111, a standard deviation of 0.499221, and minimum and maximum values between 2 and 4. This means that on average, manufacturing companies in Indonesia have tried to manage the environment following the applicable terms and conditions (blue rating). Return on equity has values varying from -49.26 to 146.62 with a standard deviation of 25.79339 and an average of 13.50343.

Table 2
Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
FO	108	34.89444	29.99881	0	93.1
CED	108	13.42778	8.76257	5.56	38.89
PROPER	108	3.111111	0.499221	2	4
ROE	108	13.50343	25.79339	-49.26	146.62

Source: Processed Data (2023)

4.2 Hypotheses Testing

The Skewness / Kurtosis testing is 0.0548 so it can be concluded that the error from the test results is normally distributed. The result of the multicollinearity test is 1.19 which can be concluded that there are no symptoms of multicollinearity. Meanwhile, for symptoms of heteroscedasticity problems can be detected as well as resolved using robust standard errors.

Table 3 is the result of hypothesis testing using multiple linear regression involving robust standard errors. The Prob>F or F test in Table 3 shows a value of 0.0000 which can be concluded that the model used can explain the dependent variable FO. The results of hypothesis testing in Table 3 show that the CED variable has a significant positive effect on FO with a coefficient of 0.964. The PROPER variable does not affect FO at 5% significance, but the PROPER variable has a significant negative effect on FO at 10% significance. Meanwhile, the ROE control variable has a significant positive effect on FO with a coefficient of 0.0432. The R-squared value is 0.251, which means that the research model used can explain the dependent variable by 25.1 percent.

Table 3
Hypothesis Testing Results

Variable	FO (1)
CED	0.964*** (0.293)
PROPER	-9.749* (5.052)
ROE	0.493*** (0.0432)
Intercept	45.63*** (15.03)
Prob>F	0.0000
R-squared	0.251

Robust standard errors in parentheses

*** p<0.01; ** p<0.05; * p<0.1

Source: Processed Data (2023)

Based on the test results in Table 3, it can be concluded that hypothesis 1 in this study which states that CED has a significant positive effect on FO is accepted. Conversely, hypothesis 2 in this study which states that PROPER has a significant positive effect on FO is rejected.

5. Discussion

The results of the research conducted show interesting results that foreign investors are proven to consider environmental aspects in making decisions to invest in companies in Indonesia. The more a company discloses its carbon emission information, the more positive the response from foreign investors will be. Carbon emission disclosure is one of the products of the sustainability report submitted by company management. Foreign investors are familiar with the existence of sustainability reports, making it easier for investors to obtain information about carbon emission disclosure from sustainability reports.

Saka and Oshika (2014) highlight the importance of carbon accounting practices in business valuations since they have a positive relationship with equity market value. Parties such as society, markets, shareholders, and international relations also influence the likelihood of carbon disclosure and the level of transparency associated with it (González-González & Ramírez, 2016). The expansion of greenhouse gas emissions could potentially be slowed by foreign ownership, which would increase the competitiveness of the company, as foreign investors tend to favor companies that release carbon emissions information (Rokhmawati, 2021; Kim et al., 2021). These arguments support the findings of this study.

Based on signal theory, foreign investors can get positive signals from company management through voluntary disclosure in the form of carbon emission disclosure in the sustainability report. Foreign investors receive signals from company management to make further considerations, which then obtain additional information on whether these companies are harmful to the environment or not, when foreign investors find it difficult to believe that the company is not dangerous, they foreign investors take action to have or increase ownership in the company. Meanwhile, on the second finding, PROPER does not have a significant effect on foreign ownership, it shows that the signals given by companies rated by the government, in this case the Ministry of Environment and Forestry, have not been able to provide signals to foreign investors to invest. However, related parties can still strive to socialize PROPER to foreign investors because there is still a little more opportunity to make PROPER as one of the signals for foreign investors in decision making considering the significance value of PROPER is negatively significant to foreign ownership at the 10% significance level.

The findings of this study do not support the basic hypothesis that businesses with foreign ownership are consistently more likely to react to environmental rating systems, which also underscores the importance of ratings from third-party agencies, foreign investors who come with different norms, laws, and regulations have not been motivated in this regard (García et al., 2009; Damayanti et al., 2021; Wong et al., 2022). A possible reason related to the results of this study is that PROPER is a rating provided by an internal state institution, namely the Ministry of Environment and Forestry, which may not be widely known by foreign investors so PROPER has not been able to provide signals that attract the attention of foreign investors. In addition, third-party ratings can indeed lead to increased transparency and thus provide disclosure related to environmental issues that accompany the company, but it does not guarantee that the company's environmental transparency is high

(Knizhnikov, 2021; Novitasari & Tarigan, 2022). Foreign investors may have this point of view in looking at companies that have PROPER ratings.

If we look at the results of descriptive statistics, there are no manufacturing companies in the sample that have the highest performance rating (gold rating), which means that there are no companies that consistently prove their superiority in protecting the environment during the company's operational activities and have implemented businesses that have ethics and responsibility to society. The maximum rating of the sample companies is still in the green rating, which means that the company has managed the environment more than regulated by utilizing resources and implementing environmental management systems efficiently to carry out social responsibility. From the sample selection process, it is also found that manufacturing companies that have a proper rating as a recognition of their environmental performance are still around 50% of the total population of manufacturing companies. This may be the reason why foreign investors are not able to absorb the benefits of the company's overall proper rating information in their decision-making, so it is considered to have no influence.

The results showed no surprise that company performance (ROE) has a significant positive effect on foreign ownership. Foreign investors are interested in having or increasing their ownership if the company provides good financial performance for the long term, if the company is unable to provide good performance (ROE), then foreign investors do not hesitate to sell their ownership to other parties or not invest in these companies.

6. Conclusions

This study conducted on a sample of manufacturing companies in Indonesia shows that disclosure of carbon emissions has a significant positive effect on foreign ownership. However, on the contrary, PROPER has a significant positive effect on foreign ownership. This finding confirms the importance of carbon emission information disclosure for foreign investors. Manufacturing companies in Indonesia are advised to increase the extent of disclosure of carbon emissions, this is considering the descriptive statistics on average are still low, even though global investors are concerned about this. On the other hand, the Indonesian government needs to convince the public or global investors of the recognition of the PROPER rating which is a domestic product. This rating needs to be socialized both to businesspeople or companies in Indonesia to be involved and be part of it, as well as to prospective global investors for the credibility and substantive quality of this rating to be able to convince in supporting their decision making. This can certainly be an input for the PROPER drafting regulator and its evaluation team so that this ministry-owned ranking can also contribute as other global sustainability rankings so that the hope is to attract foreign investor confidence into Indonesia. Future research can focus on the effect of PROPER on foreign ownership because the findings of this study show that there are still indications of the influence of these variables in the opposite direction of interaction.

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Author contributions statement

Luky Patricia Widianingsih had the initial idea. This was also discussed with Cliff Kohardinata for the conception or design of the work. Luky Patricia Widianingsih pointed out important issues regarding variable data as presented in Table 1 (measurement of variables) and its interpretation in the research model and discussion of research results in the manuscript. Cliff Kohardinata was involved in data analysis using statistical data processing software, as well as data interpretation for this study. Table 2 and Table 3 were prepared by him. Each author was involved in drafting the work or critically reviewing it for important intellectual content; the final manuscript to be published was approved and can be accounted for. The definition of criteria for authorship of this manuscript is in accordance with ICMJE guidelines. Luky Patricia Widianingsih as the corresponding author is the one individual who takes primary responsibility for communication with the journal during the manuscript submission, peer-review, and publication process.

Non-Author Contributors

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