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The Determinants of Carbon Emission Disclosures with Proper Rating as A Mediating Variable in Non-Financial Companies in Indonesia

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ABSTRACT

This study aims to find empirical evidence of the effect of company size and financial performance on the carbon emission disclosure by adding the PROPER rating as mediating variable. The total selected research data are 150 analyses which took non-financial companies listed BEI from 2015 until 2019 as the population of this research. Research data was analyzed using mediating regression analysis with IBM SPSS Statistics 25 software analysis tools and the Sobel test calculator. The result of the study empirically, the company size variable is influenced by PROPER rating and carbon emission disclosure. While financial performance does not affect carbon emission disclosure or PROPER rating. PROPER rating is able to mediate the influence of company size on carbon emission disclosure, however, the PROPER rating is not able to mediate ROA on Carbon Emissions. The limitation of this research is this result demonstrates that the stakeholder theory cannot verify the influence between variables. Suggestions for further researchers can choose companies with a greater degree of relationship to the environment, this is because the responsibility and pressure from stakeholders will be greater than companies that have little relationship with the potential for environmental damage. Second, further researchers can use other mediating and moderating variables.

1. INTRODUCTION

The world organization stated that air pollution is one of the biggest health risks in the world, only seven million deaths can be prevented, and the other 90% are still breathing polluted air with a total of almost three thousand million people. This becomes an important issue in controlling carbon emissions.

The global community recognizes the importance of good governance in long-term disaster mitigation. This is also done by Indonesia. Indonesia takes an active role in the world's commitment to reducing carbon emissions. This is evidenced by Indonesia's commitment to the National Determination Contribution (NDC) to reduce greenhouse gas emissions by 26% in 2020 and 29% in 2030. This ratification is increased by 41% in 2021 on the Paris Agreement 2015. Indonesia's commitment indicates that carbon emissions are important things to control since the long-term impact will affect the lives of the wider community.

In fact, carbon emission disclosures in Indonesia are still very rarely done. This is because the disclosure of carbon emissions is still voluntary. Rokhmawati et al (2017) in their research analysis study stated that currently, Indonesian regulations are ineffective and law enforcement is low so not all companies comply with carbon emission disclosure. In fact, the Indonesian industry plays an active role in contributing to carbon emissions. In 2014, Indonesia contributed 1.4% of the world's total CO_2 carbon emissions of a total of 13.5%. Considering the rapid development of industry in Indonesia, special attention is needed on managing carbon emissions from industry. It should be known that the main source of carbon emissions is the consumption of energy where this energy is the main source of driving the economy. Hence, energy reconstruction is the key to achieving the goal of mutual benefit (Wu et al., 2020).

There are many companies established in Indonesia that commit violations. PT Mahkota Indonesia committed a violation through chimney waste that was released but did not comply with quality standards. This caused air pollution to occur. In addition, PT Xing Xing Steel also polluted the air through condensed smoke mixed with black dust. This resulted in disturbances to the health of the surrounding community. The growth of carbon can increase the potential for disease through an increase in temperature, besides that, there will be a greater danger to people in industrialized areas (Dong et al., 2021).

The PROPER program in Indonesia can be claimed as a large program with quite expensive funds. However, this program is claimed to have an important role in the development of corporate sustainability reports (García et al., 2007). This program is expected to increase the disclosure of environmental responsibility in the industrial sector. PROPER's success in carrying out management is proven by an increase in the innovation of 46%, recorded 542 innovations in 2018 and 794 innovations in 2019 (KEMENLHK., 2019). Cost savings reached 192.63 trillion from the increase in innovation carried out in 2019. In addition, a study conducted by Egbunike & Emudainohwo (2017) states that carbon management has a significant positive effect on corporate financial performance. This assumes that the PROPER rating can be a mediator in increasing carbon emission disclosures getting stronger.

The disclosure of carbon emissions has a significant impact on government and society. The development of carbon emission research has been done a lot to see the effect of industrial activities on carrying out environmental responsibilities. Several studies on carbon emissions were conducted by Ayoib & Nosakhare, 2015; Fajarini S.W. & Triasih, 2020; Fontana et al., 2015; Giannarakis et al., 2017; Ahmadi & Bouri, 2017; Bae Choi et al., 2013; Kılıc & Kuzey, 2019. Those studies used various measurement variables such as environmental disclosure, profitability, company size, company age, industry type, institutional ownership, financial decline, etc.

Research conducted by Fajarini S.W. & Triasih, 2020; Fontana et al., 2015; & Ayoib & Nosakhare, 2015 found that company size significantly positively affects environmental disclosure. Carbon emission disclosures. In contrast to the research conducted by Gatimbu & Wabwire, 2016 found that company size does not affect carbon emission disclosures.

The results of research conducted by Gatimbu & Wabwire, 2016 finds that financial performance has a significant positive effect on environmental disclosure. The findings are different from the research conducted by Fajarini S.W. & Triasih, 2020 and Ayoib & Nosakhare, 2015, which found that financial performance does not affect environmental disclosure. Other empirical evidence is from research were conducted by Ahmadi & Bouri, 2017; Kılıc & Kuzey, 2019 found that financial performance has a significant positive effect on carbon emission disclosure. It is different from research conducted by Bae Choi et al., 2013 which finds that financial performance does not affect carbon emission disclosure.

The research above indicates inconsistency between the research results and the variables the researchers will analyze. Updating other variables that become factors in conducting carbon emission disclosures was necessary. Based on several analyzes of the PROPER program that the government has implemented to increase corporate responsibility in managing the environment, the researchers raised the PROPER rating as a mediating variable in influencing carbon emission disclosures in companies that receive the PROPER rating. The objective of this study is to know the factors that influence carbon emission disclosure as a dependent variable.

Company size is a reflection of the level of corporate operational activities. The larger the size of a company, the company will increasingly consider the quality of the resources. The community finds large-sized companies as established companies compared to small-scale companies. The companies with large sizes tend to have higher pressure from the community and stakeholders. Legitimacy theory explains that there is pressure from external parties, both social and political, so companies will be more likely to disclose information. Fajarini S.W. & Triasih, 2020; Fontana et al., 2015; Ayoib & Nosakhare, 2015; Dibia & Onwuchekwa, 2015; van de Burgwal & Vieira, 2014; Ohidoa et al., 2016; Prince Modugu & Uwabor Eboigbe, 2017 proved that companies with larger size would more and more improve the performance of environmental responsibility disclosure report.

H1. Company Size has a significant positive effect on the PROPER rating

Companies with good financial performance are considered competent in managing the companies well, and Stakeholder theory explains that companies need to pay attention to other interests. Companies with good financial performance can easily make voluntary disclosures so that pressure from outside can respond well. Thus, this makes it easier for companies to fulfill their responsibilities in environmental disclosure.

H2. Financial Performance has a significant positive effect on the PROPER rating

Company size indicates the level of activity and utilization of resources consumed by the companies in their operations. Legitimacy is an organizational concept that adopts strategies to remove gaps, such as changing relevant public perceptions using social disclosures (Gray et al., 1995, Deegan, 2002). Thus, the larger the company's size, the community will assume the company uses a lot of resources, which will generate waste due to the company's operational activities. Thus, the relationship between company size and carbon emission disclosure is significantly positive. It is in line with the previous research conducted by Ahmadi & Bouri, 2017; Kılıc & Kuzey, 2019; Bae Choi et al., 2013, who found evidence that company size has a significant positive effect on carbon emission disclosure.

H3. Company size has a significant positive effect on Carbon Emission Disclosure

Financial performance, the company will be considered good in managing the effectiveness of the company's activities, and it will give the company healthy financial structures. Thus, the companies can disclose carbon emissions. Stakeholder theory explains that an approach needs to be taken to stakeholder parties so that the company's attention is focused on profit goals and other factors (Freeman, 2004). This study is supported by the previous research which found empirical evidence that financial performance has a significant positive effect on carbon emission disclosure.

H4. Financial Performance has a significant positive effect on Carbon Emission Disclosure

The PROPER rating is a corporate assessment program in carrying out its responsibilities in terms of environmental management carried out by the minister of the environment. With stakeholder interests influencing the company, it is necessary to fulfill the responsibilities of other parties. Thus, the PROPER rating is a program carried out by the government to control the disclosure of environmental responsibility. The more an industry gets a good rating, the more it will show an increase in the exposure of carbon emissions which is part of environmental responsibility. Research conducted by Al-Tuwaijri et al., 2004; Dawkins & Fraas, 2011 found that the PROPER rating can significantly affect carbon emission disclosure.

H5. PROPER rating has a significant positive effect on Carbon Emission Disclosure

Large-sized companies will encourage the companies to improve their resources to realize the efficiency of corporate performance. Monteiro & Aibar-Guzmán (2010) explained that companies with large sizes would be more capable of making environmental disclosures than companies with middle or small level. Legitimacy theory explains the importance of companies in equalizing perceptions between company goals and external parties' goals. Therefore, with good environmental responsibility disclosures, the companies are concerned about the responsibilities of other parties. Bae Choi et al., 2013; Kılıç & Kuzey, 2019; Fontana et al., 2015; Dibia & Onwuchekwa,2015; van de Burgwal & Vieira,2014; & Ohidoa et al.,2016, found evidence that company size can have a significant positive effect on environmental performance. Therefore, the researchers assume a significant positive relationship between company size and carbon emission disclosure mediated by PROPER rating.

H6. PROPER rating can mediate the effect of Company Size on Carbon Emission Disclosure

Financial performance can show the effectiveness and efficiency of the company in generating profits through the use of assets owned by the company. Companies with good financial performance would make voluntary disclosures easily compared to companies with poor financial performance. Stakeholder theory explains the existence of external forces that require attention from the companies so that the companies need to fulfill the interests of each party. With this, it is assumed that if the companies have good financial performance, the disclosure of environmental responsibility will increase to fulfill the responsibility to stakeholders. Previous research conducted by Gatimbu & Wabwire, 2016 found empirical facts that financial performance has a significant positive effect on the disclosure of corporate environmental performance. Therefore, the researchers assume that there is a significant positive relationship between the PROPER rating as a factor that mediates the increase in carbon emissions in obtaining a better rating for the benefit of stakeholders.

H7. PROPER rating can mediate the effect of Financial Performance on Carbon Emission Disclosure

2. RESEARCH METHOD

This study was quantitative research with a research sample of non-financial companies listed on the Indonesia Stock Exchange (IDX) during the 2015-2019 time period. The criteria for the year of the sample company are presented in table 1. While the definitions and indicators of the research variables are presented in table 2.

Table 1. Sampling Criteria

Sample Criteria	**Total**
Companies listed on the Indonesia Stock Exchange (IDX) in 2015-2019	713
Companies belong to the financial sector	(94)
Non-financial companies that were not included in the Performance Rating Program (PROPER) rating given by the Ministry of the Environment of the Republic of Indonesia for the period 2015-2019	(503)
Non-financial companies that did not report consecutive financial statements in the 2016-2019 period	(56)
Companies that do not disclose carbon emissions (at least one policy related to carbon emissions) explicitly or implicitly	(30)
Samples that meet the criteria	30
Total units during analysis during the observation period 2015-2019	150
Total data analysis units	150

Source: Secondary data processed year 2021

Table 2. Definitions and Indicators of Research Variables

No.	Variables	Definition	Indicators
1.	Company size (*Size)*	Company size is a measurement made by comparing the size of one company with other companies that use total assets or various other measurements from the company. (Riyanto, 2008).	Size = Ln (Total Asset)
2.	Financial Performance	Return on Assets (ROA) is a measure of corporate effectiveness in generating profits by utilizing corporate assets. (Hidayanti and Paramita, 2014)	$\frac{\text{Net Profit}}{\sum \text{Asset of the year} + \sum \text{previous year's assets}/2 \text{ (average asset)}}$
3.	PROPER Rating	According to the Ministry of Environment (2018) defined that PROPER rating is a program given to companies as a form of acknowledgment of the existence of the law of action and reaction that has been carried out by companies.	Looking at the Decree of the Ministry of Environment: 1. Black= very bad 2. Red=bad 3. Blue=good 4. Green=very good 5. Gold= very very good
4.	Carbon Emission Disclosure	According to Choi et al (2013) explained that carbon emission disclosure is one type of environmental disclosure that has the scope of disclosure of greenhouse gases and energy use as well as performance and strategies on the target to conduct risk reduction that has an impact on climate.	Content analysis by calculating corporate disclosure based on the theory of Choi, *et al* (2013). CED = $\frac{\text{Total items disclosed}}{18}$

Source: Various references, processed on 2021

The data collection techniques used documentation and content analysis techniques based on the annual reports. The results of data analysis were obtained and analyzed using descriptive analysis and path analysis, and the Sobel test with the tools of IBM SPSS Statistics 25 and the Sobel test calculator. The hypothesis testing used the Sobel value test after the data met the assumptions of the classical assumption test criteria.

3. RESULTS AND DISCUSSIONS

Descriptive Statistical Analysis

This study's descriptive statistical analysis shows the mean, maximum, minimum, and standard deviation values of the research variables. The results of the descriptive statistical analysis are shown in the table 3

Table 3. Descriptive Statistical Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
SIZE	150	10.284	16.477	13.11499	.793553
ROA	150	-.449	1.983	.09263	.237097
PROPER	150	2	5	3.31	.592
CED	150	0.056	0.889	0.38333	.222527
Valid N (listwise)	150				

Source: Processed secondary data, 2021

Classic Assumption Test

The classical assumption test is conducted to meet the normative requirements before conducting the research hypothesis analysis. The normality test is carried out by using the Kolmogorov-Smirnov (K-S) test, which is indicated by a residual value of 0.053 ($\alpha > 0.05$), so the data are concluded to have a normally distributed component. The multicollinearity test shows the VIF value < 0.10. It is assumed that the data are free from multicollinearity. The Run Test examines the autocorrelation in the distribution of data values and obtains a residual value of 0.870, indicating that the data are free from autocorrelation. The heteroscedasticity value shows a significance number >0.05. It is concluded that the data are free from heteroscedasticity.

The coefficient of determination test is conducted to determine the effect of the research model on the dependent variable. The adjusted R2 value is 0.194. From the analysis result, it can be concluded that the effect of company size, financial performance, and PROPER rating on carbon emission disclosures has an effect of 19.4%. Meanwhile, the remaining 80.6% is influenced by variables outside the research model.

Path Analysis

The path analysis test aims to indirectly determine the relationship's size from the dependent variable. This analysis is carried out by regressing the effect of the intervening variable on the independent variable. Furthermore, regression is carried out from the dependent variable to the independent and intervening variables. The analysis results are presented in the table 4. The value of sig <0.05 indicates a significant effect, while the value of Un-standardized Coefficients indicates the direction of the effect.

Table 4. The Test Result for Path Analysis Sub I

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.360	.774		.465	.642
	SIZE	.224	.059	.300	3.794	.000
	ROA	.134	.198	.054	.678	.499

a. Dependent Variable: PROPER

Source: Processed secondary data, 2021

Table 5. The Test Result of Path Analysis Sub II

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.831	.791		-6.106	.000
	SIZE	.191	.063	.235	3.017	.003
	ROA	.009	.202	.003	.045	.964
	PROPER	.357	.084	.328	4.235	.000

a. Dependent Variable: CED_Y

Source: Processed secondary data, 2021

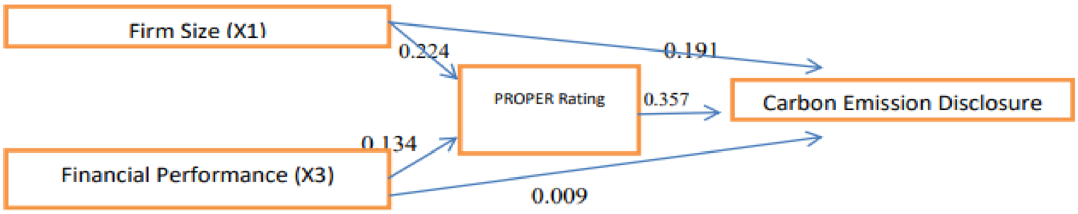

Figure 1. Model of Research Result
Source: Secondary data processed by the researchers, 2021

Sobel Test

The result of the Sobel test shows the relationship effect between the mediating variable used to influence the relationship between the independent and dependent variables. This study uses the Sobel test calculator for the significance of mediation through www.danielsoper.com to know the relationship between variables mediated by PROPER ratings. The result of the Sobel test is as follows:

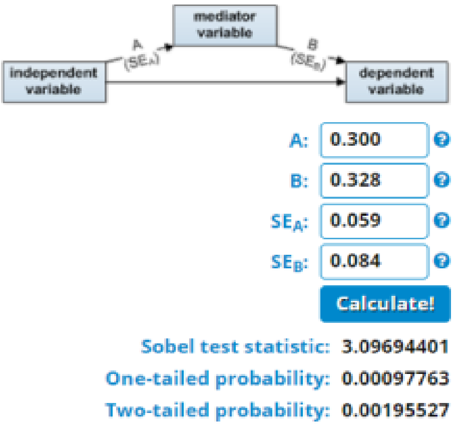

Figure 2 Company Size
Source: Processed Secondary Data, 2021

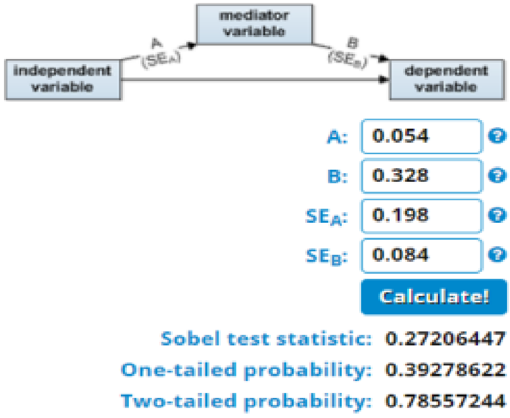

Figure 3 Financial Performance

Table 6. Summary of Research Hypothesis Results

HIP.	Explanation	Regression Coefficient	t-count	Sig.	Results
H1	Company size has a significant positive effect on the PROPER rating	0.224	3.794	0.000	Accepted
H2	Financial Performance does not have a significant positive effect on the PROPER rating	0.134	0.678	0.499	Rejected
H3	Company size has a significant positive effect on Carbon Emission Disclosures	0.191	3.017	0.003	Accepted
H4	Financial Performance does not have a significant positive effect on Carbon Emission Disclosures	0.009	0.045	0.964	Rejected
H5	The PROPER rating has a significant positive effect on Carbon Emission Disclosure	0.357	4.235	0.000	Accepted
H6	PROPER rating is able to significantly mediate Company Size on Carbon Emission Disclosure				Accepted
H7	PROPER rating is not able to mediate significantly Financial Performance on Carbon Emission Disclosure				Rejected

Source: The analysis results processed by the authors, 2021

Research on the effect of SIZE has a significant positive effect on PROPER ratings. It indicates the verification of legitimacy theory in which the companies carry out environmental disclosure to respond to external interests outside the companies. Because the larger the size of the company, it will push strong effect from the public to put pressure on the companies. Prince Modugu & Uwabor Eboigbe (2017), explained that large companies require greater costs to increase stakeholder trust and are more submissive to public scrutiny. Thus, the result of this study support previous research conducted by Fajarini S.W. & Triasih, 2020; Fontana et al., 2015; Ayoib & Nosakhare, 2015; Dibia & Onwuchekwa (2015); van de Burgwal & Vieira (2014); Ohidoa et al., (2016); Prince Modugu & Uwabor Eboigbe, (2017).

This study obtains empirical evidence that financial performance does not affect the PROPER ratings. Thus, the stakeholder theory cannot confirm a significant positive relationship between the effect of financial performance on the PROPER rating. The researchers assume that the existence of company budgeting systems makes financial performance does not affect environmental disclosure. In addition, when the companies want to increase consumer trust, the researchers assume that the companies will increase the image of the disclosure of social aid. Research conducted by Fernandes et al., (2019); Fajarini S.W. & Triasih (2020); Ayoib & Nosakhare (2015); Kılıç & Kuzey (2019) support findings that financial performance does not affect environmental disclosure.

This study shows that SIZE has a significant positive effect on carbon emission disclosures. Company size shows the level of operational activity of the company. Large-sized companies tend to get more pressure from the public, and it is because the resources used by the companies are more than others. Liu & Yang (2018) explained the disclosure of carbon emissions and political pressure from stakeholders. Thus, the larger the company SIZE, it will drive companies to disclose carbon emissions caused by the public interest. This research follows the previous research conducted by Kılıç & Kuzey (2019); Dibia & Onwuchekwa, (2015); van de Burgwal & Vieira, (2014); & Ohidoa et al., (2016).

This study shows that ROA does not affect carbon emission disclosure. This hypothesis cannot confirm the stakeholder theory, that is, the influence of external parties, one of which is the government. The researchers assume that funds are allocated for other disclosures besides the environment to increase profitability. In addition, each company allocates funds at the beginning of the period so that during the current period, the company no longer needs to allocate more funds if financial performance improves. The cost burden of the company in carrying out its responsibilities, as well as the interchange they will get, will become the considerations in disclosing carbon emissions. Thus, the hypothesis testing found insignificant results. The result of this study is in line with the research conducted by Kılıç & Kuzey (2019); Bae Choi et al., (2013); and Egbunike & Emudainohwo (2017).

The research result finds that the PROPER rating can significantly positively affect carbon emission disclosures. This study can confirm the stakeholder theory in which one of the interested parties is the government. The existence of regulations that the government applies through PROPER rating control pushes companies to disclose carbon emissions as part of their environmental responsibility. Environmental management through the PROPER rating could support the availability of more comprehensive information. It means that the PROPER rating can push the role of increasing carbon emission disclosure to encourage an increase in the PROPER rating. It is in line with the research previously conducted by Al-Tuwaijri et al., (2004); Dawkins & Fraas, (2011).

The result of this study indicates that the PROPER rating can mediate the effect of company size on the disclosure of carbon emissions. This study can verify the legitimacy theory regarding the equalization of perceptions between companies and stakeholders. Ching & Grab (2017) argued that society would pressure companies to disclose environmental responsibility with better quality and more detail. Thus, it will reduce the potential for unexpected losses due to external parties. Implementing good environmental responsibility by companies will be reflected in an increased PROPER rating.

The result of this study indicates that the PROPER rating cannot mediate the effect of ROA on carbon emission disclosures. It demonstrates that stakeholder theory cannot verify the influence between variables. The researcher's assumptions indicate that there are considerations caused by the costs that the companies must incur. The companies have annually allocated finance to disclose environmental responsibility—the insignificant effect on financial performance on environmental disclosures that are still voluntary. Thus, the government's pressure is only limited to ranking defense. It can be proven by the total average rating owned by the companies, numbered 3. That is, even though financial performance increases, it will not be able to increase the performance of environmental responsibility disclosure.

4. CONCLUSIONS

This study concludes that SIZE affects the performance of environmental disclosure (PROPER) while ROA does not affect environmental disclosure (PROPER). SIZE affects carbon emission disclosures (CED), while ROA does not affect carbon emission disclosures (CED). The PROPER rating variable can have a significant positive effect on carbon emission disclosures. The PROPER rating variable can mediate SIZE, while the PROPER rating cannot mediate ROA. The limitation of this research is this result demonstrates that the stakeholder theory cannot verify the influence between variables. Suggestions for further researchers can choose companies with a greater degree of relationship to the environment. It is because the responsibilities and pressures from the stakeholders will be greater compared to companies with a bit of connection with the potential for environmental damage. Second, further researchers can use other mediating and moderating variables.

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