

Factors which Affecting the Disclosure of Carbon Emissions

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ABSTRACT: This study aims to analyze the effect of corporate governance, capital expenditure, profitability, firm size and CSR on carbon emissions disclosure. This study collects secondary data which are reported in their Annual Report and Sustainability Report from 2017-2021. Data analysis method used is multiple linear regression. The results of the study prove that corporate governance variable has a negative effect on carbon emissions disclosure. However, four other independent variables, namely capital expenditure, profitability, firm size and CSR have positive effects on carbon emissions disclosure.

KEYWORDS: Carbon Emissions Disclosure, Corporate Governance, Financial Performance, Firm Size, CSR

INTRODUCTION

It is known that currently the people of the earth are very concerned about issues related to the balance of nature. As is known today the earth is experiencing a fairly extreme increase in temperature. Global warming cannot be separated from human activities that do not pay attention to the balance of nature when carrying out business activities. In 2019, Indonesia is one of the largest carbon emitting countries in the world, around 2% of total global emissions or 0.58GT (ucsusa.org). IPCC (Intergovernmental Panel on Climate Change) shows that the temperature on earth has escalated significantly from 1.09 [0.95 to 1.20]°C. The impact of this can be seen by the increasing amount of melting ice at the poles, which is around 150 billion tons per year, and in Greenland around 280 billion tons per year (climate.nasa.gov). It is estimated that on average in 20100 the sea level rise will reach 0.3 meters even though the growth rate of greenhouse gas emissions has been kept to a minimum (1.5°C) (Lindsey, 2022).

To prevent further damage to nature, especially this global warming disaster, it is necessary to reduce carbon emissions significantly. Companies are expected to be able to help by controlling and reducing the impact of carbon emissions obtained from company activities. However, because disclosure of carbon emissions is still not mandatory in Indonesia, companies are not moved to make disclosure reports on carbon emissions. As is known, disclosure requires quite material costs and has the potential to cause losses to companies (Sari and Susanto, 2021). So that only companies that have stable income potential will participate in making carbon emission disclosure reports.

The company's stable income level refers to the profitability value obtained. By having a profit, it means that the company can finance its operational activities, including the costs required to make a carbon emission disclosure report. Companies that have high profits are interpreted as having the financial ability to voluntarily make carbon emission reports where they are also aware of their responsibility to the environment (Ratmono et al, 2021). Sekarini & Setiadi (2021) show that profitability has a positive impact on disclosure of carbon emissions.

Capital expenditure on financial information can also affect disclosure of carbon emissions. The company's ability to spend capital that is quite large has an impact on the company's carbon emission reports that are made. Generally, they make it more detailed with the aim of improving implementation and reducing the possibility of information asymmetry (Karimet al,2021). This is because with large capital expenditures it can increase the company's operational activities which causes the carbon emissions produced to also increase so that the company has the responsibility to disclose its carbon emissions. In line with this, Karim's research et al (2021) concludes that there is a positive effect of capital expenditure on disclosure of carbon emissions.

The participation of company managers is very important in making the company generate stable profits and managing the proper allocation of capital expenditures. For this reason, it is necessary to apply correct and good corporate governance so that companies can be more transparent in providing information to the public (Herawaty et al., 2021). With good governance, it is hoped that companies will voluntarily disclose carbon emissions and the efforts made to overcome the resulting impacts on

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society. This is also shown from the results of Firmansyah's research et al (2021) and Tila & Augustine (2019) where there is a positive impact of corporate governance on disclosure of carbon emissions.

In addition to corporate governance, the size of a company can also be a benchmark for a company's ability to voluntarily make a carbon emission disclosure report. The larger the size of the company, the more activities are carried out (Irwhantoko & Basuki, 2016). The company's activities certainly directly or indirectly will have an impact on the environment so that the company is expected to have a responsibility to preserve its environment. The existence of a positive effect of company size on disclosure of carbon emissions can be seen from the results of research conducted by Firmansyah et al(2021)

In large companies, they generally pay attention to the environment by making and carrying out activities Corporate Social Responsibility. The company's CSR activities are closely related to the disclosure of carbon emissions. The company's desire to voluntarily provide an expression of its carbon emissions report shows a form of responsibility for carrying out activities Corporate Social Responsibility to society. Research from Andrian & Kevin (2021) shows that CSR has a positive influence on disclosure of carbon emissions.

There is inconsistency towards the assessment of the same variables on carbon emission disclosure from prior research which caused the needs of further assessment on factors that affect carbon emissions disclosure to be conducted.

LITERATURE REVIEW

Agency Theory

Jensen & Meckling (1976) in agency theory states that there is a relationship between company management and owners. Furthermore, agency theory can be linked to corporate governance. Good governance can minimize problems that occur between agents/business managers and owners or shareholders depending on board independence (Tila & Augustine, 2019). It is assumed that an independent board can increase company activities related to the environment and encourage disclosure of company carbon emissions (Kiliç & Kuzey, 2017).

Stakeholders Theory

Freeman (2010) in his book reveals stakeholders is a group of people or individuals who have the potential to influence or be affected by the acquisition of a business entity. Theory Stakeholders shows the company's responsibility to be obliged to convey the company's activities to its stakeholders. One of them is by making a disclosure report on carbon emissions as a form of conveying information to stakeholders for decision-making purposes.

Signaling Theory

Companies are required to provide detailed and transparent reports to the public, investors, and stakeholders so that they have confidence and trust in the performance of the company's management. Which will make many parties want to invest in the company and have an impact on increasing the value of shares (Ross, 1977). Signaling theory shows that there is a signal from the activities carried out by the company to the public to invest in the company based on the disclosure of activities carried out by the company and the impact on the environment.

HYPOTHESES

1. Effect of Governance on Disclosure of Carbon Emissions

Good governance is the implementation of a system that controls the company's operational activities so that they can run according to the company's mechanisms and can provide added value to stakeholders (Mawardiet al, 2020). Governance is closely related to the company's efforts to address environmental and climate risks. In addition, good governance is also important in monitoring company involvement in carbon initiatives (Andrian & Kevin, 2021). The better the corporate governance, the higher the company's awareness to disclose the impact and efforts made by the company on the carbon emissions it produces in a transparent manner. This is in line with research and Andrian & Kevin (2021) where good governance has a positive effect on disclosing carbon emissions. Based on this, the hypothesis is made as follows:

H1: Governance has a positive effect on disclosure of carbon emissions

2. Effect of Capital Expenditures on Disclosure of Carbon Emissions

Companies with large capital expenditures are more able to reduce and manage the resulting emissions because the equipment/machinery used is newer and more efficient due to the maintenance of the company's capital. So that companies with large capital expenditures are encouraged to convey the efforts that have been made to produce fewer emissions through disclosure of carbon emissions. Research results from Ratmonoet al(2020) shows that there is a positive impact of capital expenditure on disclosure of carbon emissions. Based on this, the hypothesis is made as follows:

H2: Capital expenditure has a positive effect on disclosure of carbon emissions

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3. Effect of Profitability on Disclosure of Carbon Emissions

In a certain period, the company has the ability to generate profits which is reflected in the company's profitability ratio (Majidah, 2019). This ratio can be used as a reference for management decision making in accordance with the conditions of the company. In addition, this ratio can describe the level of effectiveness of management performance (Anggraini & Handayani, 2021). The level of profitability is directly proportional to the disclosure of carbon emissions, this is because when the level of profitability is high, companies do not need to worry about the costs that will be incurred arises because of the disclosure of carbon emissions by companies (Prafitri & Zulaikha, 2016). Companies with high levels of profitability can allocate their financial resources to carry out environmental responsibilities so that companies will be more transparent in disclosing carbon emissions. Research by Nur Laela & Krisno (2019) and Nastiti & Hardiningsih (2022) concluded that Profitability has a significant influence on the disclosure of carbon emissions. Based on this description, the hypothesis can be formulated as follows:

H3: Profitability has a positive effect on disclosure of carbon emissions

4. Effect of company size on disclosure of carbon emissions

There are three categories of companies, namely small companies, medium companies, and also large companies (Suwito & Herawaty, 2005). Large companies usually have a large number of assets and are used in the company's operational activities to generate profits. Large companies will usually care more about environmental problems because of the pressure they get from the community, so companies voluntarily disclose carbon emissions (Melani, 2017). In line with the research of Dewayani & Ratnadi (2021) and Nastiti & Hardiningsih (2022) which concluded that company size has a significant effect on disclosure of carbon emissions. Based on this description, the hypothesis can be formulated as follows:

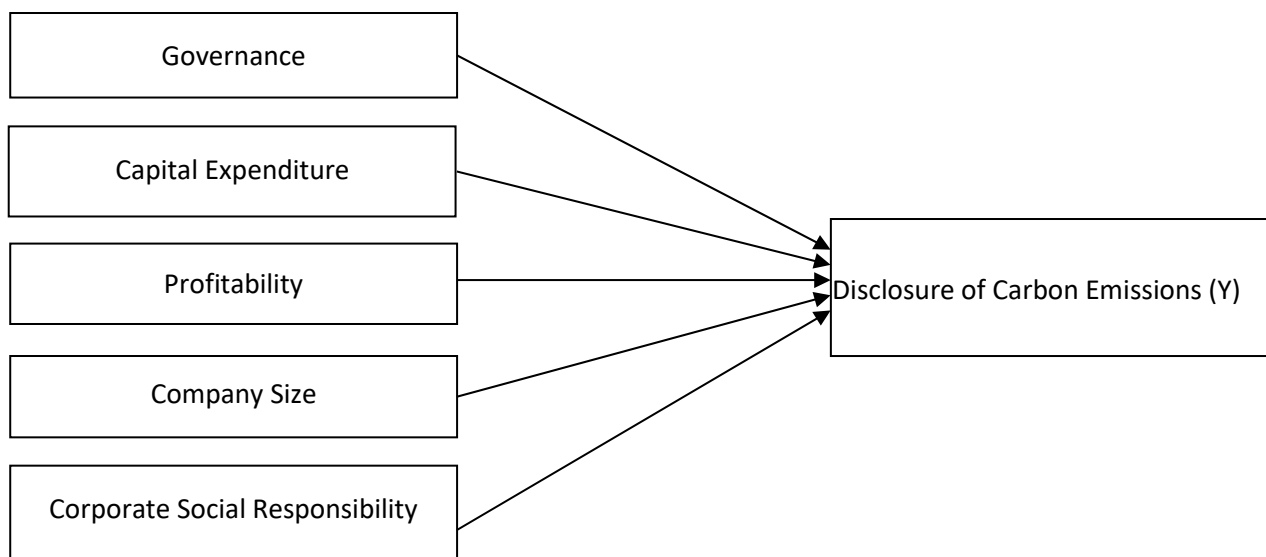
H4: Company size has a positive effect on disclosure of carbon emissions

5. Influence Corporate Social Responsibility on Disclosure of Carbon Emissions Corporate

Social Responsibility/CSR is an activity carried out by companies as a form of corporate responsibility to the community regarding the environment and social issues (Sari & Susanto, 2021). One form of CSR is the management of carbon emissions by companies. Companies with a high level of CSR are expected to disclose carbon emissions in a transparent and quality manner. The results of research from Sari & Susanto (2021) show that CRS has a positive influence on disclosure of carbon emissions. Based on this description, the hypothesis can be formulated as follows:

H5: Corporate Social Responsibility positive effect on the disclosure of carbon emissions

FRAMEWORK



RESEARCH METHODS

The research was conducted to test the effect of the hypothesis consisting of five independent variables, namely governance, capital expenditure, profitability, company size and CSR on disclosure of carbon emissions (as the dependent variable). The research is empirical in nature and uses secondary data taken from the observed company's Annual Report and Sustainability Report. The Annual Report and Sustainability Report can be accessed via website respective companies. The period in this study uses data from 2017-2021. The data in this study is included in the panel data category because it is a combination of cross

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sectional and time series. Panel data can be measured using multiple regression analysis. The data sample which is the object of observation is taken using the technique purposive sampling according to the following criteria:

Table 1. Sampling Criteria

No.	Information	Total
1.	The company is listed on the IDX until 2021	385
2.	Companies in the primary consumer goods, basic materials, energy, industrial and infrastructure sectors comply with the IDX Guidelines Industrial classification 2021	(124)
3.	The company did not submit/publish the 2017-2021 Annual Report and Sustainability Report	(229)
4.	Companies reporting losses in the Annual Report for the 2017-2021 period	(14)
5.	The number of companies that are sampled	18
6.	Research period	5
7.	The number of samples of companies observed	90

Source: Data processed by researchers

In this study, multiple linear regression models were used. There are 5 independent variables to be tested on 1 dependent variable. The model in this study can be formulated as follows:

$$CED = \alpha + \beta_1 BI_{it} + \beta_2 CAPEX_{it} + \beta_3 ROA_{it} + \beta_4 FS_{it} + \beta_5 CSR_{it}$$

Definition:

CED : Carbon Emission Disclosure

α : Constanta

BI : Board Independent

CAPEX : Enterprise Risk Management Compliance Risk (b)

ROA : Return on Asset

FS : Firm Asset

CSR : Corporate Social Responsibility

A. RESULTS AND DISCUSSION

Multiple Linear Regression Analysis

Three kinds of model approaches are carried out to get the best analysis results. The results of the model selection are summarized in the table below.

Table 2. Model Selection Test Results

Model						
Variable	CEM		FEM		REM	
	Beta	Prob	Beta	Prob	Beta	Prob
C	-2,593423	0,0000	-3,198269	0,0000	-2,699837	0,0000
BI	-1,165159	0,0005	-1,229560	0,0002	-1,181263	0,0002
LnCapex	0,016545	0,0513	0,039238	0,0111	0,020085	0,0332
Profit	0,344319	0,0678	0,397485	0,0297	0,370948	0,0335
FS	0,086447	0,0000	0,088948	0,0000	0,087869	0,0000
CSR	0,649349	0,0000	0,350684	0,0272	0,540738	0,0002
Model Selection Test						
Test Type	Cross-section Chi-square		Prob		Keputusan	
Chow Test	41,072660		0,0009		Model Selection Test	
Hausman Test	10,408850		0,0644		REM models received	
Lagrange Multiplier Test	LM-BP 4,173031		0,04111		REM models received	
Coefficient Independent Variable						
BI	Capex		Profit		FS	

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Model						
Variable	CEM		FEM		REM	
	Beta	Prob	Beta	Prob	Beta	Prob
-1,072694	0,022873		0,398604		0,094758	

Source: processed by researchers with EViews 10.

The conclusion from the results of data processing in the summary table results above shows that the probability value of the test Chow of 0.0009 < alpha value of 0.05 then this indicates that the model chosen is FEM so that the test is continued with the Hausman. On Hausman test, the probability value is 0.0644 > the alpha value is 0.05, it indicates that the selected model is REM so that the test is continued with the Lagrange Multiplier. Test results Lagrange Multiplier It can be seen that the LM-BP probability significance value is 0.04111 < alpha value 0.05 which indicates that the REM model.

Hypothesis Test Results

Table 5. Multiple Linear Analysis Test Result

Goodness of Fit Model							
		CEM		FEM		REM	
Adj R2		0,496777		0,600268		0,497902	
R2		0,525048		0,699078		0,526110	
Hypothesis		Theory	F- Stat	t-Stat	Beta	Prob (One-tail)	Hasil
H1	BI against Disclosure Carbon Emissions	+	0,00000	-3,941325	-1,181263	0,0001	Ditolak
H2	capex against Disclosure Carbon Emission	+	0,00000	2,165632	0,020085	0,0166	Diterima
H3	Profit against Disclosure Carbon Emissions	+	0,00000	2,161399	0,370948	0,0168	Diterima
H4	FS against Disclosure Carbon Emissions	+	0,00000	5,803202	0,087869	0,0000	Diterima
H5	CSR towards Disclosure Carbon Emissions	+	0,00000	3,923289	0,540738	0,0001	Diterima

Based on the test results in the table, the regression equation obtained is:

$$CED = -2,700 - 1,181BI_{it} + 0,0201CAPEX_{it} + 0,371ROA_{it} + 0,088FS_{it} + 0,541CSR_{it}$$

The results of hypothesis testing can be described as follows:

1. Test the Coefficient of Determination Based on the table it is known that the size of Adj. R2 is 0.497902. This means that the effect of governance, capital expenditure, profitability, company size and CSR on disclosure of carbon emissions is 49.79%. However, the remaining 50.21% (100% - 49.79%) is explained by other variables outside the regression model in this study. In addition, based on the results of data processing, the results of R2 of 0.526110 or 52.61% which indicates that simultaneously the independent variables can describe or have an influence on the dependent variable.

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2. F test Based on the results of data processing, it shows that the F-stat is $0.00000 < \alpha$ value of 0.05, it is concluded that statistically there is at least one independent variable that affects the dependent variable.
3. Partial Test (t test)
 - a. Based on the test results, it was found that corporate governance variables were measured by the Independent Board Of -1.181263 indicates that H1 Rejected so that there is no effect on the dependent variable, disclosure of carbon emissions. The probability value of $0.0001 < \alpha$ value of 0.05 explains that there is an influence of governance variables on the disclosure of carbon emissions however, due to the negative results, the test results are still rejected.
 - b. Based on the test results, it was found that the company's capex variable was 0.020085 indicating that H2 was accepted so that there was an influence on the dependent variable, disclosure of carbon emissions. The probability value of $0.0166 < \alpha$ value of 0.05 explains that there is an influence of the capex variable on the disclosure of carbon emissions.
 - c. Based on the test results, it was found that the company's profitability variable was 0.370948 indicating that H3 was accepted so that there was an influence on the dependent variable, disclosure of carbon emissions. The probability value is $0.0168 < \alpha$ value a significance of 0.05 explains that there is an influence of the profitability variable on the disclosure of carbon emissions.
 - d. Based on the test results, it was found that the company size variable was 0.087869 indicating that H4 was accepted so that there was an influence on the dependent variable, disclosure of carbon emissions. The probability value of $0.0000 < \alpha$ value of 0.05 explains that there is an influence of company size on the disclosure of carbon emissions.
 - e. Based on the test results, it was found that the CSR variable was 0.540738 indicating that H5 was accepted so that there was an influence on the dependent variable, disclosure of carbon emissions. The probability value of $0.0001 < \alpha$ value of 0.05 explains that there is an influence of the CSR variable on the disclosure of carbon emissions.

B. DISCUSSION

1. Corporate Governance has a negative effect on disclosure of carbon emissions.

The results of this study indicate that the better the governance, the lower the desire of the company to disclose its carbon emissions. This means that the application of agency theory cannot be implemented optimally because the company's management has not been able to fulfill the interests of the principals. The objectives of the principal and company management are not yet aligned so that disclosure of carbon emissions tends to be low. This research is inversely proportional to previous research conducted by Mawardiet al. (2020) which states that good governance is the implementation of a system that controls the company's operational activities so that they can run according to company mechanisms and can provide added value to stakeholders. In addition, it is also contrary to Andrian & Kevin's research (2021) which proves that good governance has a positive effect on disclosing carbon emissions.
2. Capital expenditure has a positive effect on disclosure of carbon emissions.

The results of this study indicate that the greater the capital expenditure (capex), the higher the company's desire to disclose its carbon emissions. This means that the company is trying to apply the signaling theory. Through this theory, the company tries to give a signal to stakeholders regarding the company's operational activities that have an impact on the environment, in this case activities that produce carbon emissions. This study supports previous research conducted by Ratmonoet al. (2020) which proves that there is a positive effect of capital expenditure on disclosure of carbon emissions.
3. Profitability has a positive effect on disclosure of carbon emissions.

The results of this study indicate that profitable companies will have a higher desire to disclose their carbon emissions. This research supports previous research conducted by Prafitri & Zulaikha (2016) which stated that the level of profitability is directly proportional to the disclosure of carbon emissions, because with high profitability, companies do not need to worry about the costs that will arise from disclosing carbon emissions by companies. Apart from that, this research supports previous research conducted by Nur Laela & Krisno (2019) and Nastiti & Hardiningsih (2022) with the result that profitability has a significant effect on the disclosure of carbon emissions.
4. Company size has a positive effect on disclosure of carbon emissions.

The results of this study indicate that the larger the size of the company, the higher the desire of the company to disclose its carbon emissions. This research is consistent with Melani (2017) which states that large companies will usually care more about environmental problems due to pressure from society so that companies voluntarily disclose carbon emissions. This is

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proven by the disclosure of carbon emissions in the sustainability reports published for each website by each company. This research is also in line with Dewayani & Ratnadi (2021) and Nastiti & Hardiningsih (2022) who concluded that company size has a significant effect on disclosure of carbon emissions.

5. Corporate Social Responsibility has a positive effect on the disclosure of carbon emissions.

The results of this study indicate that the greater the disclosure of CSR that has been carried out by a company, the greater the desire of the company to disclose its carbon emissions. This means that companies are trying to apply stakeholder theory. Through this theory, companies try to fulfill the wishes of their stakeholders by disclosing activities carried out by companies that have an impact on the economy, social and environment. Sari & Susanto's research (2021) explains that CSR is an activity carried out by companies as a form of corporate responsibility to the community regarding the environment and social issues. The results of this study are consistent with Sari & Susanto (2021) which proves that CSR has a positive influence on the disclosure of carbon emissions.

CONCLUSION

This research was conducted to prove empirically and analyze the influence of governance, capital expenditure, profitability, company size and CSR on disclosure of carbon emissions in companies in the primary consumer goods sector, basic materials, energy, industry and infrastructure listed on the IDX in 2017-2021. Based on the test results and analysis it can be concluded that:

1. Corporate governance has a negative effect on disclosing carbon emissions, meaning that if a company implements good governance, the company's desire to disclose its carbon emissions tends to be low.
2. The company's capital expenditure has a positive effect on the disclosure of carbon emissions, meaning that if the company spends on large fixed assets, the company's desire to disclose its carbon emissions increases.
3. Company profitability has a positive effect on carbon emissions disclosure, meaning that if a company is profitable, it tends to voluntarily disclose its carbon emissions.
4. Company size has a positive effect on disclosing carbon emissions, meaning that if the size of the company is getting bigger, the desire to disclose carbon emissions will increase.
5. CSR has a positive effect on disclosure of carbon emissions, meaning that if more CSR criteria are disclosed in accordance with the GRI standards in the sustainability report, the disclosure of carbon emissions will also increase.

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