Carbon Emission Disclosure: Testing The Influencing Factors

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Abstract
This study aims to detremine the effect of profitability, leverage, company size and media exposure to carbon emission disclosure in manufacturing companies in the basic and chemical industry sectors in 2016 – 2018. The study population consisted of 71 companies and sampled as many as 13 companies or 39 data samples using a sampling technique that is purposive sampling. Data is collected by the company's Annual Report or Sustainability Report and processed using SPSS version 25.Based on research results it can be concluded that : 1) there is no effect between profitability on carbon emission disclosure, 2) there is a influence between leverage on carbon emission disclosure, 3) there is no effect between company size on carbon emission disclosure, 4) there is a effect between media exposure on carbon emission disclosure .This study has limitations, including the limited observation period in 2016-2018 which allows it to give different results when the study period is longer.The expected benefit from the results of this research is that it can be used as a consideration in making investment decisions, considering that disclosure of information related to carbon emissions is one of the important things for stakeholders.

Keywords: *Profitability, Leverage, Company Size, Media Exposure, Carbon Emission Disclosure.*

I. INTRODUCTION

The current development of the industrial world is in line with the economic development which has grown significantly. In line with this, the effects of environmental pollution such as global warming and carbon emissions also increase. Regarding the management of environmental pollution, it is a topic that needs to be discussed throughout the world, including in Indonesia. International political commitments on this matter have been regulated in the United Nation Framework Conventation on Climate Chage (UNFCCC) which ultimately underlies the concept of sustainable economic development. Companies that carry out industrial activities can be a significant factor in producing greenhouse emissions. Industrial growth will be directly proportional to the increase in greenhouse gas emissions which can have an impact on environmental quality degradation. To find out how much efforts to reduce greenhouse gas emissions by companies, it can be seen from the disclosure of carbon emissions in the annual report as a form of social responsibility.Climate change is currently an interesting topic of environmental pollution in the business world. Greenhouse gases generated from human activities in the industry can cause climate change. The greenhouse effect occurs due to increased emissions of gases such as carbon dioxide (CO2), methane (CH4), dinitrooxide (N2O), chlorofluorocarbons (CFC) that trap solar energy in the earth's atmosphere (Anggraeni, 2015). Moreover, CO2 emission contributes most to environmental pollution. According to the Carbon Disclosure Project (CDP, 2017), only 100 companies are responsible for contributing 71% of global greenhouse gas (GHG) emissions since 1988. Furthermore, 25 companies of them, both state-owned and private corporations, contribute more than 50% of global industrial GHG emissions. The CDP says that this significantly contributes to climate change.

Indonesia plans to reduce carbon emissions by 26% to 29% from 2020 to 2030. Although it is only 3%, it is high based on the metric percentage. Indonesia has ratified the Kyoto Protocol the Law no. 17 of 2004 on July 28, 2004. This is one of Indonesia's efforts to implement sustainable development and to reduce global GHG emissions. As in the Presidential Decree No. 61 of 2011 and Presidential Decree No. 71 of 2011

(Jannah, 2014), article 4 of Presidential Decree No. 61 of 2011 states that business actors also contribute to reducing GHG emissions through the carbon emission disclosure.The phenomenon of carbon emissions in Indonesia has become an important event. This is because in 2015, Indonesia became one of the largest contributors to carbon emissions with 1.35 gigabytes of CO2 (www.bbc.com/indonesia). In 2019, Indonesia became the fourth largest greenhouse gas emitter in the world according to the Green Building Low Carbon Eco District - French Agency Environmental and Energy Management Mathhhieu Caille (sindonews.com). There were many cases related to the greenhouse effect. In 2015, the smoke emitted by PT Panply's plywood factory caused air pollution in Makassar (sindonews.com). The air pollution in Ciampea District, Bogor Regency, West Java in 2016 was caused by the lime burning using used tires. As a result, local peoples suffer acute respiratory problems because of the smoke from the lime factory (www.Republika.co.id). Previous studies found that carbon emission disclosed by companies in Indonesia is still low (Cahya, 2016). Disclosure of GHG emissions in Indonesia is voluntary and is rarely carried out by business entities (Zulaikha, 2016). Previous researches still focus on the factors that influence social-environmental disclosures which are not specific to disclosures of GHG emissions. Companies that disclose carbon emissions have many consequences and considerations to avoid threats to companies such as increasing operating costs, reducing demand, reputation risk, legal proceedings, and penalties.

Choi et al., (2013) showed that there was a significant increase in carbon disclosure from 2007 to 2009 in developing countries (OECD, 2010). However, Wong et al., (2013) found that carbon disclosure in developing countries is lower than in developed countries. The purpose of this study is to examine variables that can affect the disclosure of carbon emissions in Indonesia. The variables used in this study are profitability, leverage, firm size and media exposure. Previous research conducted by (Irwhantoko & Basuki, 2016; Ravena, 2018) which examined the effect of profitability and disclosure of carbon emissions gave empirical results that profitability had an effect on disclosure of carbon emissions. However, research conducted by (Deantri, 2018; Pratiwi, 2016) provides evidence to the contrary.Fatkhudin (2020) and Deantri (2018) who conducted tests on the effect of Leverage on disclosure of carbon emissions found evidence that Leverage had an effect on disclosure of carbon emissions.They also conducted research to examine the effect of firm size on disclosure of carbon emissions and found evidence that firm size affects the disclosure of carbon emissions. Different results were revealed by (Cahya, 2016; Irwhantoko & Basuki, 2016), they found no evidence of the influence of firm size on disclosure of carbon emissions. Cahya (2016); Pratiwi (2016); Ridwan (2017) investigated the effect of Media Exposure on the disclosure of carbon emissions. As a result, Ridwan (2017) found evidence that media has an effect on disclosure of carbon emissions, while Cahya (2016); Pratiwi (2016) reveal evidence to the contrary.This research is interesting to do because it is to re-verify the results of previous studies which provide different empirical evidence in testing the variables used in this study. Research on the practice of disclosing carbon emissions has not been widely carried out, especially in Indonesia. The samples are basic and chemical industrial companies listed on the IDX because companies that are included in the category of industries that are intensive in producing carbon emissions are basic and chemical industrial companies.

II. METHODS

Legitimacy theory explains that companies disclose social responsibility to gain legitimacy from the local community and maximize their long-term financial strength. Legitimation Theory is a “social contract” between the company and the community where the company operates and uses economic resources. Legitimacy theory encourages companies to take responsibility for the environment to make it seems credible to the community. Companies not only cause environmental problems in the surrounding area but have also grown into global warming caused by the gases they emit (Cahya, 2016).Legitimacy is considered important for the company because it is a strategic factor for the company's future development. One example of the company's efforts to gain legitimacy is through intense social activities as desired by the local community. Failure to fulfill community desires threatens the legitimacy of the company and affects the company's ability to continue its business. The carbon emission disclosure is expected to show that companies can measure their emissions and market actors will respond to this disclosure (Wicaksono, 2019).

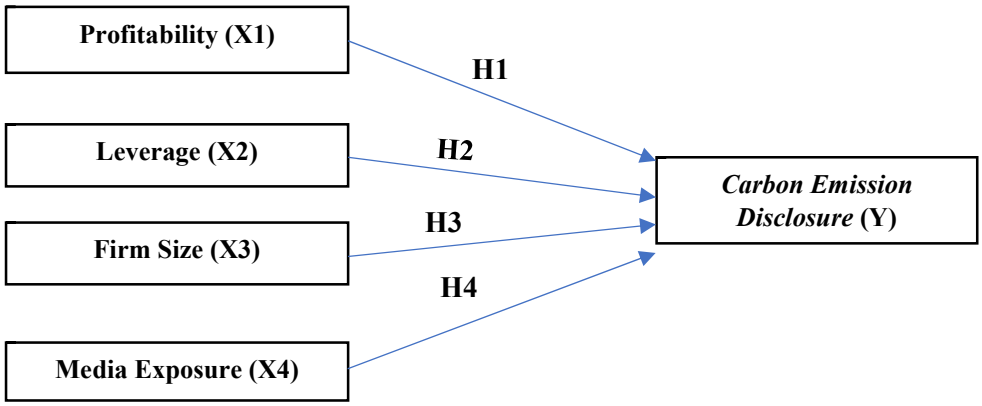
Therefore, this system prioritizes the alignments or interests of the community. Legitimacy theory has been extensively used to explain the motivation for voluntary environmental disclosure by organizations (Pellegrino & Lodhia, 2012).

Stakeholder Theory

Stakeholder theory illustrates to which party the company should be responsible (Richter & Dow, 2017). The stakeholder theory explains that companies necessarily need to benefit stakeholders to get their supports. The stakeholders include shareholders, creditors, consumers, suppliers, government, society, analysts and other parties. Basically, stakeholders are able to influence the use of economic resources by the company (Ghozali & Chariri, 2007). The stakeholder theory as the dominant paradigm has further strengthened the concept that companies are responsible not only to shareholders but also to stakeholders (Maulida, 2016).In legitimacy theory, large companies get more social and political pressure than small companies (Wong et al., 2013). This encourages the company to build a positive image to gain legitimacy from stakeholders and the local community. Irwhantoko & Basuki (2016; Ravena (2018) investigated the relationship between profitability and disclosure of carbon emissions and found empirical evidence that profitability affects the carbon emission disclosure.

However, Deantri (2018); Pratiwi (2016) did not find an effect of profitability on carbon emission disclosure.Research on the effect of leverage on disclosure of carbon emissions conducted by Deantri (2018); Fatkhudin (2020) found that leverage has positive and negative effects on carbon emission disclosure. They investigated the relationship between firm size and carbon emission disclosure they found that firm size affects carbon emission disclosures. On the other hand, Cahya (2016); Irwhantoko & Basuki (2016) did not find any effect of firm size and carbon emission disclosure. Cahya (2016); Pratiwi (2016); Ridwan (2017) also tried to investigate the relationship between Media Exposure and disclosure of carbon emissions. Ridwan (2017) investigated the relationship between media exposure and disclosure of carbon emissions and found that media affects the disclosure of carbon emissions. However, Cahya (2016; Pratiwi (2016) found that media does not affect carbon emission disclosure.

Framework and Hypotheses



H1 : Profitability affects the Carbon Emission Disclosure.
H2 : Leverage affects the Carbon Emission Disclosure.
H3 : Firm Size affects the Carbon Emission Disclosure.
H4 : Media Exposure affects the Carbon Emission Disclosure

The Effect of Profitability on Carbon Emission Disclosure

Cahya (2016) in his research states that companies with good financial performance capabilities will have a greater chance of trying to reduce their company's emissions. Efforts made include various company initiatives such as replacing machines that are more environmentally friendly, or other environmental measures such as tree planting actions to increase CO2 absorption. In accordance with the theory of legitimacy, the community usually exerts pressure on companies to care about environmental problems. Companies with good profitability have more resources that can be used to make environmental disclosures than companies with low profitability, making it easier for companies to gain legitimacy from the community (Baber et al., 2013).

Profitability is measured using ROA (Return On Total Assets). According to Lorenzo (2009) the higher the ROA value indicates that a company's financial performance is getting better. The better financial performance of a company will provide financial capability to implement a carbon emission reduction strategy into its business strategy. Choi et al. (2013) revealed that companies with good financial conditions are able to pay additional human resources for voluntary reporting on carbon emission disclosures. Companies with good financial performance have the financial capacity to make environmental decisions. Conversely, companies with poor financial performance will focus on achieving improvements in their performance thus limiting their ability to report carbon emissions (Wong et al., 2013). This is in line with research by Irwhantoko & Basuki (2016); Ravena (2018) which found empirical evidence that profitability affects the disclosure of carbon emissions.

H1: Profitability affects the Carbon Emission Disclosure.

Effect of Leverage on Carbon Emission Disclosure

Leverage level has an influence on disclosure. This is because larger liabilities and interest payments will limit a company's ability to pursue carbon reduction and disclosure strategies. Companies with high leverage will be more careful in making decisions about expenses related to carbon prevention measures (Wong et al., 2013). Companies with high leverage may not be able to absorb the adverse financial impacts of disclosing carbon information. Research Deantri (2018); Fatkhudin (2020) provide empirical evidence that leverage has an effect on disclosure of carbon emissions.

H2: Leverage affects the Carbon Emission Disclosure.

III. RESULT AND DISCUSSION

This study is causality research. The causality research is the research designed to examine the possibility of a causal relationship between the dependent and independent variables. This study aims to determine the influence of profitability, leverage, company size and media exposure to carbon emission disclosure. The research was conducted on manufacturing companies in industrial and chemical sectors listed on the Indonesia Stock Exchange for the period 2016-2018. The samples were selected using the purposive sampling method which is based on certain considerations, especially by the experts.In this study, carbon emission disclosure was measured using several items adopted (Choi et al., 2013). The measurement method used is the content analysis by reading the annual reports of sample companies to find out how much companies disclose their carbon emissions.

The following formula is to calculate CED:

$$CED = \Sigma di / M$$

CED = carbon emission disclosure

Σdi = The total of score 1 obtained by the company

M = Maximum discslosable item (18 items)

The profitability is measured using the following ROA (Return on Asset) ratio:

$$Return\ On\ Assets\ (ROA) = \frac{Net\ Income}{Total\ Assets}$$

The leverage in this study is measured using the Debt to Assets Ratio (DAR) because it reflects the large proportion between total debt and total assets.

$$Debt\ to\ Asset\ Ratio = \frac{Total\ Debts}{Total\ Assets}$$

The firm size is measured using the company's total assets for a certain year. A large total asset value requires a natural logarithm (Ln). According Irwhantoko & Basuki (2016) the formula to measure firm size is as follows:

$$Size = Ln\ (Total\ Aset)$$

Media exposure is measured using a dummy variable where the value of 1 is for companies that disclose more information about carbon emissions in the company's website, annual reports, sustainability reports, newspapers, and other media while the value of 0 is the opposite. The data in this study were analyzed using descriptive statistics, classical assumption tests and hypothesis testing. Besides, multiple regression was used to test the effect of independent variables on the dependent variable.

Result of Profitability, Leverage, Firm Sizze, Media Exposure, and Carbon *Emission Disclosure*

No	Year	Firm	ROA	DAR	SIZE	ME	CED
1	2016	INTP	13,40%	13,00%	31,04	1	0,72
2	2017		6,30%	15,00%	30,99	1	0,72
3	2018		4,00%	16,00%	30,96	1	0,72
4	2016	SMBR	6,00%	29,00%	29,11	1	0,33
5	2017		3,00%	33,00%	29,25	1	0,28
6	2018		1,00%	37,00%	29,34	1	0,28
7	2016	SMGR	10,22%	14,16%	31,42	1	0,72
8	2017		3,30%	20,42%	31,52	1	0,72
9	2018		6,02%	19,28%	31,57	1	0,72
10	2016	AMFG	4,70%	34,60%	29,34	1	0,11
11	2017		0,60%	43,40%	29,47	0	0,11
12	2018		0,10%	57,30%	29,76	1	0,17
13	2016	TOTO	6,53%	40,97%	28,58	0	0,11
14	2017		9,87%	40,07%	28,67	0	0,17
15	2018		11,97%	33,40%	28,69	0	0,17
16	2016	INAI	2,66%	81,00%	27,92	0	0,06
17	2017		3,18%	77,00%	27,82	0	0,06
18	2018		2,89%	78,00%	27,97	0	0,06
19	2016	NIKL	2,12%	66,57%	28,11	0	0,17
20	2017		1,30%	66,98%	28,17	0	0,17
21	2018		0,95%	70,78%	28,39	0	0,17
22	2016	UNIC	9,31%	28,97%	28,75	0	0,06
23	2017		5,33%	29,20%	28,74	0	0,06
24	2018		7,31%	29,64%	28,86	0	0,06
25	2016	ISSP	1,70%	56,00%	29,43	0	0,06
26	2017		0,10%	55,00%	29,47	0	0,11
27	2018		0,80%	55,00%	29,5	0	0,11
28	2016	JPFA	12,20%	50,00%	30,54	1	0,22
29	2017		5,20%	60,00%	30,62	1	0,39
30	2018		9,80%	60,00%	30,77	1	0,06
31	2016	INKP	2,90%	59,00%	25,25	1	0,11
32	2017		5,40%	57,90%	25,36	1	0,11
33	2018		6,70%	56,90%	25,57	1	0,11
34	2016	SPMA	5,20%	48,50%	28,4	0	0,06
35	2017		5,60%	45,00%	28,41	0	0,06
36	2018		3,60%	44,40%	28,46	0	0,11
37	2016	TKIM	0,30%	62,30%	24,23	1	0,17

38	2017		1,20%	61,40%	24,28	1	0,17
39	2018		8,30%	58,30%	24,48	1	0,17

Results of Multiple Linear Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1,029	,539		-1,907	,065
	Profitability	-,022	,011	-,282	-1,966	,058
	Leverage	-,008	,003	-,397	-2,485	,018
	Size	,037	,026	,205	1,421	,165
	Media Exposure	,342	,087	,505	3,918	,000
a. Dependent Variable: Carbon Emission Disclosure						

Based on the table above, the following equation can be formed:

Y = - 1,029 - 0,022) ROA -0,008) DAR + (0,037) SIZE + (0,342) ME + ε

4.1 The Effect of Profitability on Carbon Emission Disclosure

The results of the analysis show that t count <t table (- 1.966 <2.035) with the significance value greater than the level of significance which is 0.05 (α = 5%) (0.058> 0.05). Thus, H1 is rejected. It means that profitability does not affect carbon emissions' disclosures. This indicates that the successful financial performance of a company cannot be a consideration in disclosing carbon emissions. It can be concluded that the high profitability of the business is not necessarily matched by high transparency of GHG pollution and that profitability cannot be used as an indicator in predicting carbon emission disclosure.This result is in line with Deantri (2018); Pratiwi (2016) that profitability proxied by ROA does not affect environmental disclosure. This is because when a company has a high profit, the company considers it unnecessary to disclose information that can interfere with the company's financial success. However, this is in contrast with Cahya (2016); Ravena (2018) which stated that profitability affects carbon emissions disclosure. Furthermore, Lorenzo (2009; Pradini (2013) also found that companies with low profitability actually take advantage of environmental disclosure for legitimacy purposes. Conversely, companies with high profitability do not expand their environmental disclosure because it may interfere with the company's financial success.

4.2 The Effect of Leverage on Carbon Emission Disclosure

The results of the analysis show that t count > t table (- 2.485> 2.035) with the significance value smaller than the level of significance which is 0.05 (α = 5%) (0.018 <0.05). Therefore, H2 is accepted. It means that leverage affects carbon emissions disclosure. It can be concluded that leverage can be used as an indicator in predicting carbon emissions disclosures. It is possible that the company can control debt dependence on investors and creditors in financing its assets so that the company can disclose its carbon emissions.This finding proves that leverage affects the disclosure of GHG emissions of basic industry and chemical companies listed on the Indonesia Stock Exchange from 2016 to 2018. This means that the higher the leverage, the lower the level of GHG emissions disclosed by basic industry and chemical companies listed on the Indonesia Stock Exchange. This is in line with Andiningtyas (2014); Deantri (2018) who concluded that companies with high leverage have only a few funds to implement a carbon reporting system because of the high debt burden so that they will be more careful in reducing and disclosing it, especially about spending related to carbon prevention efforts.

4.3 The Effect of Frm Size on Carbon Emission Disclosure

The results show that t value <t table (1.421 <2.035) with the significance value greater than the level of significance which is 0.05 (α = 5%) (0.165> 0.05). Therefore, H3 is rejected. It means that firm size does not affect carbon emission disclosure. This result is consistent with Cahya (2016; Irwhantoko & Basuki (2016) who stated that firm size does not affect carbon emission disclosures. Thus, a larger company does not determine whether the company will make more extensive carbon emission disclosure than a smaller

company. However, this research is not in line with Andiningtyas (2014; Fatkhudin (2020) which stated that firm size affects carbon emission disclosure.

4.4 The effect Media Exposure on Carbon Emission Disclosure

The results show that t count> t table (3,918> 2,035) with the significance value smaller than the level of significance which is 0.05 (α = 5%) (0,000 <0.05). Thus, H4 is accepted. It means that media exposure affects carbon emission disclosure. This indicates that media can encourage companies to publish their activities in the environmental sector to get a positive response from their stakeholders. This is in line with the legitimacy theory of social responsibility disclosed by companies to gain legitimacy from the local community and maximize their long-term financial strength. Likewise, stakeholder theory says that companies operate not only for their own interests but also for their stakeholders.

This result is in line with research conducted by Dawkins & Fraas (2011); Jannah (2014) which found that media visibility is directly associated with the level of voluntary disclosure of climate change. Likewise, Wong et al. (2013) explained that media exposure is positively related to CSR disclosure. However, this result is in contrast with the research conducted by Cahya (2016; Pratiwi (2016) which explains that media exposure does not affect carbon emission disclosure.

IV. CONCLUSION

Based on the results, it can be concluded that profitability and company size does not significantly affect carbon emission disclosure, while leverage and media exposure significantly affect carbon emission disclosure.

Limitation and study forward

The limitations of this study include the limited observation period of 2016-2018 which allows it to give different results if the study period is longer. Further research is expected to add more observation duration, to consider and look for other independent variables that affect carbon emission disclosures such as quality of corporate governance, institutional ownership, company age and others.

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