The effect of media exposure, type of companies, and environmental performance on carbon emission disclosure of Indonesia companies

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ABSTRACT

The Effect of Media Exposure, Type of Companies, and Environmental Performance on Carbon Emission Disclosure (CED) in Indonesia Companies (Empirical Studies on Manufacture Companies Listed on The Indonesia Stock Exchange for the 2016-2018 Period). This study aimed to obtain empirical evidence regarding the effect of Media Exposure, Type of Companies, and Environmental Performance on the disclosure of carbon emissions in manufacturing companies in Indonesia. Measurement of the extent of carbon disclosure was done by using a checklist developed based on the information request sheet provided by the CDP (Carbon Disclosure Project). The populations of this study were all manufacturing companies listed on the Indonesia Stock Exchange from 2016-2018. The samples of this research were from manufacturing companies listed on the Indonesia Stock Exchange from 2016-2018 using the purposive sampling method. There were 15 companies in 2016, 15 companies in 2017, and 15 companies in 2018 that met the criteria as a research sample. The classic assumption test was performed for data analysis and regression analysis for hypothesis testing. The results of this study indicated that Media Exposure affects the disclosure of corporate carbon emissions in Indonesia. While the Type of Companies and Environmental Performance had no effect on the disclosure of corporate carbon emissions in Indonesia.

Keywords: carbon emissions, greenhouse gases, voluntary disclosures

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INTRODUCTIONS

Climate change is now gaining significant attention as a global environmental issue (Haque & Islam, 2013). According to Intergovernmental Panel on Climate Change (2019), the average global surface temperature is increasing at a rate of 1,5ºC resulting in climate change in various places including Indonesia. One of the ones causing climate change in the world is greenhouse gases that are produced by activities human. There are fifty of the 500 largest listed companies in the world responsible for nearly three-quarters of the 3.6 billion metric tons of greenhouse gases (IPCC, 2018).

Efforts of the international community to deal with the phenomenon of climate change began after the signing of the United Nations Framework Convention on Climate Change (UNFCCC) (Kardono, 2010). Indonesia has ratified the Kyoto Protocol through Law No. 17 of 2004 to carry out sustainable development and participate in

efforts to reduce global GHG emissions. Indonesia itself has committed to reducing carbon emissions by 26 percent in 2020, which is approximately 0.67 Gt.

Indonesia's commitment to reducing carbon emissions can also be seen in Presidential Decree No. 61 of 2011 and Presidential Decree No. 71 of 2011. In article 4 of Presidential Decree No. 61 of 2011, it was stated that business actors also took part in efforts to reduce GHG Efforts. Efforts GHG emission reductions (including carbon emissions) by companies as actor businesses can be known from the carbon emission disclosure.

Carbon Emission Disclosure in Indonesia is still voluntary disclosure and the practice is still rarely done by business entities. According to Pradini and Kiswara (2013), disclosure of greenhouse gas emissions practices including carbon emissions is still a low level to meet ISO 14064-1 guidelines. Companies that disclose carbon emissions have some considerations including getting legitimacy from stakeholders, and avoiding trend eats, especially for companies that produce gas greenhouse gases such as increasing operating costs, reducing demand, reputation risk, legal proceedings, as well as fines and penalties (Berthelot & Robert, 2011).

Luo et al., (2013) and Choi et al., (2013), examine factors that affect the disclosure of carbon emissions (Carbon Emission Disclosure). The basis of measurement of the disclosure of carbon emissions is an information request sheet provided by the CDP (Carbon Disclosure Project). However, factors that influence emissions disclosure carbon in these studies are different. Luo et al., (2013) used variables Independent Developing Country, ROA, Leverage, Growth opportunities, Carbon Emission, Size, Legal System, ETS, and Newer Asset, while Choi et al., (2013) uses Company Size, Profitability, Carbon Emission Level, Industry Type, and Quality of Corporate Governance as the independent variable. Based on these studies, further testing was carried out regarding the factors that influence the disclosure of carbon emissions in companies in Indonesia.

This study aimed to examine the factors that affect the area disclosure of carbon emissions (Carbon Emission Disclosure) at manufacturing companies in Indonesia from 2016-2018, which covers Media Exposure, Regulators, and Environmental Performance. The determination of the research year from 2016 to 2018 was based on the BSN (National Standardization Agency) in December 2009 which adopted ISO related to GHGs namely ISO 14064 and 14065. BSN established 4 Indonesian National Standards (SNI) on Greenhouse Gases (GHG) consisting of SNI ISO 14064-1: 2009, SNI ISO 14064-2: 2009, SNI ISO 14064-3: 2009, and SNI ISO 14065: 2009. The GHG SNI was arranged as a reference in calculating carbon emissions (Bsn.go.id, 2009). The next section will present a literature review followed by an explanation of the method. The research results are then presented, discussed, and concluded.

LITERATURE REVIEWS

Disclosure of carbon emissions (Carbon Emission Disclosure) is a starting issue developing in various countries related to the impact of climate change on survival the organization is no exception in Indonesia. Disclosure of carbon emissions by the company can be known from the annual report and sustainability report. Several theories explained regarding the disclosure of carbon emissions are included in environmental disclosures, namely legitimacy and stakeholder theory.

Grand Theory 1: Legitimacy Theory

Legitimacy theory explains that disclosure of social responsibility is done by the company in its efforts to gain legitimacy from the community where the company is located and maximize its financial strength in the long run. Underlying the theory of legitimacy is the "social contract" that occurs between a company and the community where the company operates and uses economic resources (Harsanti, 2011).

Legitimacy theory depends on the premise that there is a 'social contract' between the company and the community in which it operates. A social contract is a way to explain a large number of people's expectations about how an organization should carry out its operations. These social expectations are not fixed but change over time. This requires companies to be responsive to the environment in which they operate (Rokhlinasari, 2015). The industry is one of the main factors that participate in the destruction of nature because the raw materials used contain various chemicals and emissions released by the industry will potentially pollute the air. Therefore, the environmental responsibility report, which contains disclosure of GHG emission information, is one of the industry's efforts to report its business operations in the context of exploring, controlling, and protecting nature and the environment. Information on the disclosure of GHG emissions is expected to help create added value for an entity in order to able to continue to sustain its business (Anggraeni, 2015).

Grand Theory 2: Stakeholder Theory

Stakeholder theory says that companies are not entities that only operate for their own benefit, but must provide benefits for their stakeholders (holders shares, creditors, consumers, suppliers, governments, the public, analysts, and others). Thus, the existence of a company is strongly influenced by the support given by stakeholders to the company (Broadbent & Unerman, 2011).

Some reasons that encourage companies to pay attention to the interests of stakeholders, namely: 1)

Environmental issues involve the interests of various groups in society that can disrupt their quality of life. 2) In the era of globalization, products that are traded must be environmentally friendly. 3) Investors in investing tend to choose companies that own and develop environmental policies and programs. 4) NGOs and environmentalists are increasingly vocal in criticizing companies that don't care about the environment (Rokhlinasari, 2015).

Based on stakeholder theory, 5 different stakeholder groups have different views on how an organization should conduct its operations, various social contracts will be "negotiated" with different stakeholder groups rather than a contract with society in general as stated by the legitimacy theory (Broadbent, Unerman, & Broadbent, 2014).

The Effect of Media Exposure on Carbon Emission Disclosure

Legitimacy theory broadly tests the role played by media news on increased pressure caused by public demands on companies. Media has an important role in social mobilization movements, for example, interested groups on the environment (Nur & Priantinah, 2012). The media also plays an important role in communicating information to the public. Information regarding the activities of the company is also included in the information that can be communicated to the public. Companies need to be aware of the media that oversees their activities because they are related to the values and the reputation of the company.

The company in this case has a moral obligation to disclose its activities not only limited to financial aspects but social and environmental aspects. More and more media are actively monitoring the environment of a country, and the company will be more motivated to reveal their activities (Nur & Priantinah, 2012). This is in line with research (Dawkins & Fraas, 2011) that media visibility is directly associated with the level of voluntary disclosure of climate change. Likewise, Wang et al., (2013) explain media exposure is positively related to CSR disclosure. Based on the description, the hypothesis in this study is:

H1: Media Exposure is positively effects on Carbon Emission Disclosure.

The Effect of Regulators on Carbon Emission Disclosure

Climate change is one big concern nowadays and it requires special action so that the goal of SDG can be achieved. To achieve the goal of SDG, the role of government is needed in the form of policy (Jones et al., 2017). The company carries out environmental responsibility to gain legitimacy from stakeholders. The government (regulator) is also a stakeholder and has great authority to pressure companies to take responsibility for the environment and carbon disclosure (Jung, Herbohn, & Clarkson, 2016). The government (regulator) which aware of environmental problems due to company activities, it tends to be pressure companies to be more environmentally responsible so that this has a positive effect on the disclosure of carbon gas emissions (Pratiwi, 2017). Based on the description, the hypothesis in this study is:

H2: Regulator is positively effects on Carbon Emission Disclosure.

The Effect of Environmental Performance on Carbon Emission Disclosure

According to (Dawkins & Fraas, 2011) research, environmental performance has a relationship positive with environmental Disclosure namely climate change. This is in line with research (Matsumura et al., 2014) which shows that more companies' proactive environment (for example, through initiatives such as implementing pollution prevention programs that are strong and use renewable energy, etc.) has an incentive to voluntarily disclose environmental information, such as the level of carbon emissions in order disclose the types of performance they are not directly observed by investors and other external stakeholders. The results of the study are in line with the research (Clarkson et al., 2008) shows that environmental performance is positively associated with level disclosure of a discretionary environment.

According to (Clarkson et al., 2008), companies with superior environmental performance have a proactive environmental strategy. This encourages companies to inform investors and other stakeholders through voluntary disclosure about the environment. The company is trying to reveal the type its performance through voluntary disclosure that cannot be easily imitated by companies with poor environmental performance. This has the potential to increase the value company. Based on these descriptions, the hypothesis in this study is:

H3: Environmental Performance is positively effects on Carbon Emission Disclosure

Empirical Studies

There are several studies conducted by other researchers related to this issue. Firstly, the study was conducted by Bo Bae Choi, Doowon Lee, and Jim Psaros in 2013. The study indicated that for companies operating in the intensive industry (Emissions Intensive Industries), the Level of Carbon emissions, Company Size / Firm Size, Profitability, and Corporate Quality Governance take effect against Carbon Emission Disclosure. Secondly, the study was conducted by Richatul Jannah in 2014. It concluded that the Media Exposure, industry type,

profitability, company size, and leverage affect the disclosure of corporate carbon emissions in Indonesia. Whereas environmental performance does not affect the disclosure of corporate carbon emissions in Indonesia. Thirdly, it was a study conducted by Titik Akhiroh, Kiswanto in 2016. It found Organizational visibility, profitability, managerial ownership, and audit committee significantly influenced to the extent of carbon emission disclosure. Meanwhile, environmental performance, financial distress, institutional ownership, and independent commissioner proportion had no significant influence on the extent of carbon emission disclosure. Lastly, Atang Hermawan, Isye Siti Aisyah, Ardi Gunardi, Wiratri Yustia Putri conducted a study in 2018. The study indicated that the regulators had an effect on carbon emission disclosure, company size influenced carbon emission disclosure, and profitability affected carbon emission disclosure, while institutional ownership did not affect carbon emission disclosure.

This study refers to research conducted by Choi et al., (2013) who researched Company Carbon Emission Disclosure at the top 100 companies in Australia. Carbon Emission Disclosure is measured using several items in five broad categories relevant to climate change and emissions carbon developed by Choi et al., (2013), namely risks and opportunities climate change, greenhouse gas emissions, energy consumption, home gas reduction glass and costs, and carbon emissions accountability. The difference in research is that researchers add the Media Exposure variable, Type of Companies, and Environmental Performance with the 2016-2018 research period. Object research is a manufacturing company listed on the Indonesia Stock Exchange.

METHODS
Research Design
In this study, Carbon Emission Disclosure was measured using several methods items adopted from the research of Choi et al., (2013). To measure the extent of disclosure of carbon, Choi et al., (2013) developed a checklist based on the information request sheet provided by CDP (Carbon Disclosure Project). Choi et al., (2013) determined five broad categories relevant to climate change and carbon emissions. In these five categories, 18 items were identified. The following is the carbon emissions disclosure checklist.

TABLE 1. Carbon Emission Disclosure Checklist

Category	Item
Climate Change: Risks and Opportunities	CC-1: Risk assessment/description (rules/regulations both specifically, and general) related to climate change and actions taken to manage these risks.
	CC-2: Current (and future) assessment/description front) of financial, business and financial implications opportunities of climate change.
GHG / Greenhouse Gas	GHG-1: Description of the methodology used to calculate greenhouse gas emissions (e.g. GHG or ISO protocol).
	GHG-2: Existence of external verification the quantity of GHG emissions by whom and on what basis.
	GHG-3: Total greenhouse gas emissions (metric ton CO2-e) produced.
	GHG-4: Disclosure of scope 1 and 2, or 3 direct GHG emissions.
	GHG-5: Disclosure of GHG emissions based on origin or source (for example: coal, electricity, etc.).
	GHG-6: Disclosure of GHG emissions based on facility or segment level.
	GHG-7: Comparison of GHG emissions with previous years.
EC/Energy Consumption	EC-1: The amount of energy consumed (e.g. tera-joules or PETA-joules).
	EC-2: Quantification of the energy used from renewable resource.
	EC-3: Disclosures by type, facility or segment.
Gas Reduction Greenhouse and Costs (RC / Reduction and Cost)	RC-1: Details of the plan or strategy to reduce GHG emissions.
	RC-2: Specifications of the target level/level and year of GHG emission reduction.
	RC-3: Reduction of emissions and costs or savings (costs or savings) achieved when this is as a result of the reduction plan carbon emissions.
	RC-4: Future emission costs taken into account in shopping planning capital (capital expenditure planning).
Emission Accountability Carbon AEC/Accountability of Emission Carbon)	AEC-1: Indication of where the committee board (or other executive bodies) have responsibility for actions related to climate change.
	AEC-2: Description of the mechanism by which the board (or other executive body) review company progress regarding change climate.

Source: Choi et al., (2013)

Carbon Emission Disclosure index calculation is carried out using the following steps following: Gives a score on each disclosure item on a dichotomous scale. The maximum score is 18, while the minimum score is 0. Each item is 1 so if it is firm discloses all items in the information in the Report the company score is 18. Score in each company then added up.

Media exposure is measured using a dummy variable where the value is 1 for companies that disclose more information related to carbon emissions through the company's website, as well as various disclosure media such as annual reports, sustainability reports, newspapers, and various other media, otherwise, the value of 0 is given. The regulator is measured by distinguishing between state-owned companies and companies private. SOE companies are coded 1 and private companies are coded 0. Environmental performance was measured using PROPER.

Setting and Participants

The population of this study was all manufacturing companies listed on the Stock Exchange in the year 2016-2018. According to Sugiyono (2010), the population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions. In addition, the sample was chosen based on several criteria. In addition, the whole subject of research or the essential total number of a sample is called population (Arikunto, 2013). According to Sugiyono (2017) the sample is part of the number and characteristics of the population. The sample criteria that were used are:
1. Manufacturing Companies listed on the IDX for 2016-2018.
2. Providing annual reports or sustainability reports for 2016-2018.
3. Companies that implicitly or explicitly disclose carbon emissions (include at least one policy related to carbon/greenhouse gas emissions or disclose at least one carbon emission disclosure item.

Data Collection Method(s) and Analysis

The data that had been collected was processed using statistical analysis tools multiple linear regression analysis with the equation model as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Information:
Y = Carbon Emission Disclosure
α = Constant
β_1- β_3 = Regression Coefficient
X_1 = Media Exposure
X_2 = Regulator
X_3 = Environmental Performance
e = Error

RESULTS AND DISCUSSION
Results
Description of Research Samples
The object of this research was manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2016-2018. The sample selection in this study used a purposive method sampling. Based on this method, there are 15 companies included in the sample criteria. An explanation of sampling was shown in the table below.

TABLE 2. Population and Research Samples for 2016-2018

Sample Criteria	Total
Total Manufacturing sample companies that publish Annual Report and Sustainability Report in 2016-2018	**123**
Total of companies that did not disclose information on carbon emissions of Greenhouse Gas emissions in the Annual Report and Sustainability Report	**(108)**
Research Samples based on Criteria	**15**

Source: processed secondary data by researchers, 2019

Descriptive statistics in this study were presented in table 3. In the table, it showed that 45 annual and sustainability reports are examined in this research period (2016-2018).

TABLE 3. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Media Exposure	45	0	1	0,76	**0,435**
Regulator	45	0	1	0,13	**0,344**
Environmental Performance	45	1	4	3,07	**0,751**
Carbon Emission Disclosure	45	0	17	7,82	**6,143**
Valid N (listwise)	**45**				

Source: processed secondary data by researchers, 2019

Variable Description

Table 3 shows the Media Exposure of the 45 reports studied showing that the mean value was 0.76. The standard deviation value of 0.435 is lower than the average value which means that the Media Exposure of the company under study is low during the study period. The Media Exposure minimum value is 0 and the maximum value is 1 where the range value is 1.

The regulator of the 45 reports studied showed that the mean value was 0.13. The standard deviation value of 0.344 is higher than the average value which means that the regulator of the company under study is high during the study period. The Regulator minimum value is 0 and the maximum value is 1 where the range value is 1.

PROPER (measurement for environmental performance variables) of the 45 reports studied showed that the mean value was 3.07. The standard deviation value of 0.751 is lower than the mean which means that the PROPER of the company under study is low during the study period. The minimum value of PROPER is 1 and the maximum value is 4 where the range value is 3.

Carbon Emission Disclosure of the 45 reports studied showed that the mean value was 7,82. The standard deviation value of 6,143 is lower than the average value which means that the Carbon Emission Disclosure of the company under study is low during the study period. The Carbon Emission Disclosure minimum value is 0 and the maximum value is 17 where the range value is 16.

Discussion

Testing the results was done by multivariate analysis using regression analysis linear multiple. A clearer picture of the regression results would be explained in table 4.

TABLE 4. Hypothesis Test Result

Variables	Unstandardized Coefficients (B)	Significance Value ($\alpha = 5\%$)
(Constant)	-4,331	**.145**
Media Exposure	11,124	**.000**
Regulator	-3,196	**.094**
Environmental Performance	**1,361**	**.111**

Source: processed secondary data by researchers, 2019

From the calculation above, it can be concluded that 1 (one) independent variables affect the Carbon Emission Disclosure (CED), namely: Media Exposure (X1) and 2 (two) independent variables that do not affect the Carbon Emission Disclosure variable, namely the Regulator (X2) and Environmental Performance (X3). Based on table 4, the mathematical equation is summarized as follows:

CED = (-4,331) + 11,124 X1 - 3,196 X2 + 1,361 X3 + e

Based on SPSS output, Media Exposure has a positive effect on carbon emission disclosure. This shows that the role of the media can encourage companies to publicize their activities in the environmental field in order to get a positive response from their stakeholders. This is in line with the theory of legitimacy disclosure of social responsibility or carried out by the company in its efforts to get legitimacy from the community where the company is located and maximize its financial strength in the long run. Likewise, with stakeholder theory that the company operates not only for its own sake but also must provide benefits for its stakeholders. These results support research conducted by (Dawkins & Fraas, 2011) that media visibility is directly associated with the level of voluntary

disclosure of climate change and research (Wang et al., 2013) which explains that Media Exposure is positively related to CSR disclosure.

Based on SPSS output, the Regulator has no effect on Carbon Emission Disclosure. These results are not in line with research by Pratiwi (2017), regulators have a positive relationship with Carbon Emission Disclosure. Windrianningsih (2018) proves that the efforts of the government (Regulator) have no influence on Carbon Emission Disclosure.

Based on SPSS output, Environmental Performance has no effect on Carbon Emission Disclosure. This result is not in line with Dawkins and Fraas (2011) research, environmental performance has a positive relationship with environmental disclosure, namely climate change. According to Pradini and Kiswara (2013), increasing PROPER ratings can reduce the motivation of companies to disclose their greenhouse gas emissions. PROPER's high-ranking publications indirectly represent the company's commitment to addressing climate change.

CONCLUSIONS AND SUGGESTION

This study aimed to examine the factors that influence Carbon Emission Disclosure in manufacturing companies in Indonesia, which cover Media Exposure, Regulators, and Environmental Performance. An analysis of carbon emissions disclosures obtained from company reports which include Annual Report and Sustainability Report. Based on the analysis that has been done in this study, it can be concluded that Media Exposure affects carbon emission disclosure manufacturing companies in Indonesia. Whereas regulators and environmental performance do not affect the carbon emission disclosure of manufacturing companies in Indonesia.

This research has limitations that can be used as a material consideration for subsequent researchers. First, the company is the only research sample total of 15 companies each in 2016, 2017, and 2018. Second, is the influence of the subjectivity of researchers in assessing the extent of carbon emissions disclosure. This happens because of differences in viewpoints assessing the disclosure. Third, in assessing the extent of disclosure of carbon emissions (Carbon Emission Disclosure), researchers adopted from the study of Choi et al., (2013) without adjusting to conditions in Indonesia.

With these limitations, it is expected that further research can improve the limitations of this study. First, add variables that can explain the effect to the extent of disclosure of carbon emissions in companies in Indonesia such as competition, carbon emission levels, quality of corporate governance, audit quality, etc. Second, extend the year of observation and enlarge the research sample. Third, develop measurements for disclosure of emissions carbon according to the conditions in Indonesia.

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