Government Ownership, Media Exposure and Firm Characteristics on Carbon Emission Disclosure: The Case of Indonesia Manufacturing Industry

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ABSTRACT

This study aims to empirically examines the relationship between Government Ownership, Media Exposure, Company Size, Leverage, and Profitability and Carbon Emission Disclosure. Disclosure of Carbon Emissions was assessed using a Carbon Disclosure index checklist. In this study, the population consists of manufacturing companies that have been listed on the IDX between 2016 and 2019. Using a method of purposive sampling, a sample of up to 110 reports is selected. Using multiple regression analysis, this study examines its hypotheses. The findings of this study indicate that Media Exposure and Company Size have a significant positive effect on Carbon Emission Disclosure, whereas Government Ownership, Leverage, and Profitability have no significant effect on Carbon Emission Disclosure.

Keywords: Carbon Emission Disclosure; Government Ownership; Media Exposure; Firm Characteristics.

1. INTRODUCTION

The subject of global warming has become a major concern in numerous nations. According to data released on the public.wmo.int website by the World Meteorological Organization, 2016 is the hottest year in recorded history. The average annual temperature of the earth's atmosphere is 1.1 degrees Celsius higher than it was before the industrial revolution of 1850-1899, which caused climate anomalies throughout the world, including Indonesia. Global warming is primarily caused by an excess of greenhouse gases in the atmosphere, which blanket the earth and reflect incoming heat radiation back to its surface. Carbon dioxide (CO_2) is the greenhouse gas that poses the greatest threat to global warming (Nurdiawansyah et al., 2018).

Indonesia is one of the world's leading emitters of greenhouse gases (Prasetya & Yulianto, 2018). Greenhouse gas emissions are among the most prevalent carbon emissions generated by industry and transportation (Kurniawati & Biduri, 2018). Multiple occurrences that have occurred throughout 2019 have contributed to the continued deterioration of environmental quality. The degradation in environmental quality includes the phenomena of air pollution, as indicated by the compass, which identifies Jakarta as the second most

polluted city in the world, with a pollution level of 160. (Mantalean, 2019). Forest and land fires (karhutla) in Sumatra, Kalimantan, and Nusa Tenggara have released 709 million tons of carbon dioxide into the atmosphere, contributing to air pollution (Welle, 2018).

Attending the UN Climate Change Conference COP25 in Madrid, Spain, is the Indonesian government's response to attempts to reduce greenhouse gas emissions and climate change. The conference held from December 2-13, 2019, with the subject "Time for Action." The 2020 Paris Agreement will debate decreasing global warming to 1.5 ° C, which is one of the key objectives offered at this meeting (Erwanti, 2019). In Presidential Decree No. 61 of 2011 addressing the National Action Plan for Decreasing Greenhouse Gas Emissions, it is stated that business actors also participate in efforts to decrease GHG emissions, demonstrating Indonesia's commitment to reducing GHG emissions. Companies' efforts to reduce greenhouse gas emissions (including carbon emissions) are disclosed in the Carbon Emission Disclosure (Jannah & Muid, 2014).

In developing nations, like Indonesia, the implementation of sustainable development procedures is hampered, particularly by environmental concerns (Nugroho et al, 2017). In Indonesia, environmental information and disclosure, particularly regarding carbon emission, are still voluntary. However, the Indonesian government does regulate corporate social responsibility. The Law no. 40/2007 on Corporations mandates that enterprises engaging in CSR efforts must disclose these activities in their financial statements. The regulation does not specify which CSR data must be published. As one of the stakeholders legitimately responsible for environmental sustainability, the Indonesian government is under considerable pressure to implement programs and activities related to ecological conservation improvement and mitigation. For example, under the Ministry of Environment and Forestry, the Indonesian government has established specialist institutions such as the Forest Development Financing Center (P2H Center) for this purpose (Utami et al. 2021)

Disclosure of carbon emissions is developed as an accounting treatment for global warming issues, by presenting the company's approach to carbon generated by the company's operational activities in its annual report, and with this disclosure, companies can take precautions or reduce carbon emissions (Pratiwi & Sari , 2016). Disclosure of carbon emissions in Indonesia is still restricted to voluntary disclosure, and business owners rarely comply (Irwhantoko & Basuki, 2016). The information on climate change is extremely beneficial, particularly for investors such as shareholders and creditors who are attempting to estimate the long-term impact of their investments. In the company's sustainability report and annual report, you can find additional information on carbon emissions.

Carbon Emission Disclosure is influenced by several aspects, including voluntary disclosure level, environmental performance, firm age, industry type, profitability, leverage, and institutional ownership. Choi et al. (2013) found that firm size, carbon emission levels, industry type, and corporate governance quality influence carbon emission disclosure, but neither profitability nor leverage do. Similar to Choi (2013), Borghei-Ghomi and Leung (2013) found that company size, company's age, and institutional ownership affect carbon emission disclosure. In Indonesia, Suhardjanto et al. (2018) found that firm size, profitability, and international certification have a substantial impact on environmental disclosure among 41 Indonesian and 56 Malaysian enterprises. Budiharta & Kacaribu (2020) discovered that carbon emission information disclosure levels in Indonesia are rather low. The average is below fifty percent. This may indicate that the Indonesian industrial sector does not recognize the significance of carbon emission and climate change challenges. In general, Indonesian businesses and their governing bodies are not currently concerned with tackling these concerns. This study's findings may also suggest that applicable government measures regarding climate change are not (yet) effective.

Based on the findings of prior research, it is intriguing to conduct this study in order to re-verify the different findings of past research on the factors that influence the practice of declaring carbon emissions. In addition, research on the disclosure of carbon emissions remains limited, particularly in Indonesia, and in this study, researchers utilized the most recent yearly report data, i.e. 2015-2018. The sample companies are Indonesia Stock Exchange-listed manufacturing companies.

2. LITERATURE REVIEW

Disclosure of carbon emissions (Carbon Emission Disclosure) is an issue that is beginning to emerge in Indonesia as a result of the influence of climate change on the long-term viability of organizations. Carbon emission disclosure is available in the company's annual report and sustainability report. Disclosure of carbon emissions, which is part of environmental disclosure, is explained by a number of theories, including the legitimacy theory and stakeholder theory.

Suchman (1995) defines legitimacy as the popular view or assumption that an entity's acts are desirable, appropriate, or appropriate within a socially built system of norms, values, beliefs, and definitions. This study employs the legitimacy theory to support the assumption that corporate activities to fulfill social responsibility are accepted in the company's operating environment.

According to stakeholder theory, a firm cannot operate solely for its own profit; it must also create benefits for its stakeholders (shareholders, creditors, consumers, suppliers, government, society, analysts and other parties). Thus, the existence of a corporation is largely determined by the support it receives from its stakeholders (Ghozali and Chariri, 2007).

Carbon Emission Disclosure is a method for analyzing an organization's carbon emissions and establishing goals for reducing those emissions. In this study, disclosure of carbon emissions was measured using a number of elements borrowed from Choi et al (2013). According to the research of Choi et al. (2013), there are five broad categories important to climate change and carbon emissions: Climate Change (Risks and Opportunities), Greenhouse Gas Emissions (Greenhouse Gas), Energy Consumption, Reduction and Cost of Carbon Emissions, and Carbon Emissions Accountability (Accountability of Emission Carbon).

Government is one of a company's interests. Government ownership of a company's stock results in the company's activities aligning with government interests (Amran & Devi, 2008). According to the findings of Pratiwi's (2018) study, the government has a beneficial impact on Carbon Emission Disclosure since it has the ability to pressure businesses to be environmentally responsible. Based on the previous explanation this first hypothesis is:
H1: Government Ownership has a significant effect on Carbon Emission Disclosure

In their research, Widiastuti et al. (2018) defined media exposure as business events or activities that have social and environmental repercussions and are covered or published by the media. According to the findings of Jannah and Muid (2014), media exposure influences carbon emission disclosure positively. This is consistent with the findings of Kurniawati and Biduri (2018), who found that media exposure influences the declaration of carbon emissions in Indonesian manufacturing enterprises. This indicates that the presence of the media will encourage businesses to disclose carbon emissions in their annual reports. Based on the previous explanation this second hypothesis is:
H2: Media Exposure has a significant effect on Carbon Emission Disclosure

The amount of information disclosed in a company's financial statements may be influenced by its size. Large organizations will disclose more information than smaller ones, on average (Rusdianto, 2013: 44). According to research by Luo et al. (2013), the size of a corporation influences the disclosure of carbon emissions positively. High expectations are placed on carbon management practices by stakeholders. In response to this pressure, the corporation can make social and environmental disclosures to obtain the support of stakeholders and community credibility. Based on the previous explanation this third hypothesis is:

H3: Company size has a significant effect on Carbon Emission Disclosure

One of the financial performance ratios that stakeholders pay attention to is leverage. Creditors are one of the stakeholders with influence on the organization. The more the corporation's leverage, the greater the creditors' ability to repress the company (Ghazali, 2015). Companies with a high level of leverage will prioritize paying off their commitments over making voluntary disclosures. Due to the restricted allotment of cash, businesses must decide whether to utilize these funds to pay off all of their commitments or to make voluntary disclosures (Prafitri & Zulaikha, 2016). Based on the previous explanation this fourth hypothesis is:

H4: Leverage has a significant effect on Carbon Emission Disclosure

Profitability is frequently employed as a measure of environmental responsibility. Financially healthy businesses are more likely to reveal environmental facts (Prafitri & Zulaikha, 2016). This is consistent with the findings of Choi et al. (2013), who found that enterprises in excellent financial standing are able to pay for the additional human and financial resources required for voluntary reporting and improved carbon emissions disclosure. Based on the previous explanation this fifth hypothesis is:

H5: Profitability has a significant effect on Carbon Emission Disclosure

3. RESEARCH METHODOLOGY

The objective of this study is to evaluate the effect of one or more independent variables using quantitative research methodologies and a causal approach. Data acquired from 2015-2018 annual financial reports and sustainability reports published on the official websites of each company. In addition to obtaining extra knowledge through appropriate Internet sites. The data is collected by tracing the sample company's financial statements in accordance with the study's criteria.

3.1 Definition and Measurement of Variables
This study employs an index created by Choi et al. (2013) based on the CDP's information request sheet to measure the level of carbon emission disclosure (Carbon Disclosure Project). Following are the procedures involved in calculating the Carbon Emission Disclosure index:
 1. Assigned a score of 1 if the company discloses the item as specified.
 2. Assigned a score of 0 if the specified item is not disclosed by the company.
 3. Then the overall score of 1 is added and divided by the maximum number of items that can be expressed then multiplied by 100%.
Thus, the following is the carbon emission disclosure formula developed in this study:
CED = (Σ di / M) x 100%

Furthermore, the independent variable used in this study is government ownership which is measured using a dummy variable to distinguish between state-owned companies (state-

owned companies) and private companies. BUMN companies are coded 1 and private companies are coded 0. The objective of differentiating between BUMN companies and private companies is to determine the extent of disclosure of carbon emissions between state-owned companies whose majority shares are owned by the government and private companies.

Media exposure is measured using a dummy variable where the value is 1 for companies that disclose information related to carbon emissions through all three media, namely company websites, annual reports and sustainability reports. If the company discloses information relating to carbon emissions less than the three media, it will be assigned a value of 0.

The size of the company can determine investors' perceptions of the company (Hery, 2017: 3). According to Hartono (2013: 254), the size of the company can be measured using the calculation of the logarithmic value of total assets. According to Rodoni et al., (2014: 193). The formula used to measure company size can be informed as follows:

Company Size = Ln (Total Assets)

Leverage is used to measure the company's ability to meet all obligations, both short and long term. how effectively the company uses its resources. Resources are such as receivables and capital assets. Leverage is the ratio between total debt and total assets owned by the company. Leverage is measured by comparing the amount of debt with the amount of equity. Leverage can be formulated as follows:

DER = Total Debt / Total Equity

The method used to measure profitability is Return On Assets because ROA describes the technical characteristics related to company efficiency. The hope is, the higher the ROA, the better. ROA is obtained by:

ROA = Net profit after tax / Total Assets

3.2. Population and Sample

The sample companies used in the study were selected by purposive sampling with the aim of obtaining samples in accordance with the research objectives. The sample selection used in this study are as follows:

Table 1. Sample selection

No.	Description	Amount
	Number of manufacturing companies listed on IDX in 2019	171
	Manufacturing Company of IPO and delisting in IDX	(30)
	Companies that do not identify information about carbon emissions and greenhouse gases on *Annual report* or *Sustainability Report*	(108)
	Total sample of the company	33
	Number of observations (33 x 4)	132
	Companies that do not regularly assign information about carbon emissions and greenhouse gases on *Annual report* and *Sustainability report*	(22)
	Total sample of companies that meet the period	110

4. RESULT

According to a descriptive statistical test table, the Carbon Emission Disclosure (CED) variable has the lowest (smallest) value of.0056. The result shows that the corporation has disclosed only 1 out of 18 carbon emission-related details in its Annual report. While PT. Indocemen Tunggal Perkasa TBK had the highest value (maximum) of 0.7222 in 2017, the company disclosed a total of 13 items regarding carbon emissions in its Annual report.

Mean Carbon Emission Disclosure (CED) value is 0.17475. These statistics can be derived from all existing samples of carbon emissions disclosure rate, which averages barely 17 percent in Annual reports. According to the data indicating the lack of voluntary disclosure of carbon emissions, few individuals participate in initiatives to minimize carbon dioxide emissions (CO2).

Government Ownership (GO) is measured as an independent variable based on the disclosure of carbon emissions by state-owned and private corporations. Samples from state-owned corporations that revealed carbon emissions were assigned a value of 1, whereas samples from private organizations were assigned a value of 0. As much as 92 samples, or 83.64 percent of the entire research sample, pertain to a private corporation that discloses information regarding greenhouse gas emissions. In the meantime, the less BUMN companies disclose 18 samples, or 16.36 percent.

As an independent variable, media exposure (ME) is quantified based on the media's disclosure of greenhouse gas emissions. A sample that reveals more about greenhouse gas emissions disclosures has a value of 1 for companies who provide information about carbon emissions via three full media, namely their website, annual report, and sustainability report. If the corporation releases carbon emissions information in less than three media outlets, it will be rated 0. As many as 20 samples, or 18.18 percent of the total research samples, suggest that more businesses are disclosing information on carbon emissions through the media. While fewer organizations reveal as many as 90 samples, or 81.82 percent, less than half do so.

In the firm size variable (size), PT. Tirta Mahakam Resources Tbk's has the smallest value (minimum) of Rp.13,612. 815,997 in total asset worth for the year 2016 (in millions of rupiah). The greatest value (highest) for PT. Astra International Tbk is 19,658. With a total asset worth of Rp 344,711,000 in 2018, (in millions of rupiah). On average (mean) at a company size of 16.07405, 52 samples out of 110 samples have a value above average, which represents 47 percent of companies that become samples, including large enterprises, because their asset worth is already above average. Approximately 58 total assets Company owned is still below the average of all sample companies, which indicates that 53 percent of sample data still belongs to small-sized businesses.

The leverage variable (DER) for PT Semen Baturaja Tbk in 2015 has the smallest (minimum) value of (0.108). In that year, PT. Semen Baturaja TBK only had a 10 percent debt to capital, which means that if a liquidation occurred that required paying all obligations, PT. Semen Baturaja TBK could prudently pay the debts with the capital it held, since it only had a 10 percent debt to capital. This indicates that the company remains healthy. At PT. Tirta Mahakam Resources TBK Company in 2018, the highest value (maximum) amounted to $9,555. Total debt of Rp 835,881,014,674 compared to total capital of Rp 923,366,433,799 This indicates that 95 percent of the company's business activity in 2018 was owing to debt, indicating poor financial performance. Average (mean) is 1.25940. In other words, 125 percent of the sample company's average leveraged value is quite high because the debt has exceeded the quantity of capital. This indicates that the samples in this study had, on average, poor financial performance based on leverage value.

Profitability as an independent variable, the profitability variable (ROA) for PT. Citra Tubindo Tbk in 2017 has the lowest value (minimum) of -0.081. In terms of PT. Citra Tubindo TBK's financial performance, the company's total assets saw a loss of around 8

percent. The status of 2017 in 2017 is not favorable. While the highest value (maximum) for PT. MERCK TBK. is 0.9210, the minimum value is 0.9209. In 2018, the earnings earned in the year nearly equaled the total assets owned, resulting in a 92 percent return on assets. It indicates that PT. MERCK TBK has already achieved a solid financial performance this year. The average (mean) profitability (ROA) is 0.08999, which indicates that the average rate of return on assets for all research samples is 8%.

Multiple linear regression analyses were utilized throughout testing. Table 1 provides a more concise summary of the outcomes of the regression.

Table 2 : Multiple Linier Regression

Independent variables	Regression Model			
	Coefficient B	T	Sig	Inferred
(constant)	-0,276	-2,863	0,005	
Government Ownership	0,001	0,066	0,947	Not significant
Media Exposure	0,387	17,567	0,000	Significant
Company size	0,023	4,048	0,000	Significant
Leverage	0,003	0,487	0,628	Not significant
Profitability	0,001	0,019	0,985	Not significant
R square	0,787			
F statistic	76,709			
F Sig	0,000[b]			
N	110			

The result of regression analysis in Table 2 generates a regression equation that can be formulated as follows:

CED = -0,276 + 0,001GO + 0,387ME + 0,023SIZE + 0,003DER + 0,001ROA + Ɛ

Variable definitions:
CED : *Carbon Emission Disclosure*
GO : *Government Ownership*
ME : *Media Exposure*
Size : Company Size
THE: *Leverage*
ROA : profitability (*Return On Assets*)
α: Regression constants
β : regression coefficient

The test results in Table 2 indicate that the Adjusted value of R^2 is 0, 787 or 79%. This shows that a 79% variability of carbon emissions disclosure is influenced by *Government Ownership* (GO), *Media Exposure* (ME), firm size (SIZE), *Leverage* (DER), and profitability (ROA). The remaining 21% variability of carbon emissions disclosure is influenced by other variables not examined in this study.

The test result on Table 1 shows the F_{count} of 76.709 with a significance of 0.000 smaller than 0.05. It shows that simultaneously, government ownership, media exposure, company size, *leverage* and profitability are jointly influential with the disclosure of carbon emissions.

5. DISCUSSION

Here is a discussion of the previously conducted data testing analysis results:

5.1 Influence of Government Ownership on Carbon Emission Disclosure

According to the findings of this study, Government Ownership had no effect on Carbon Emission Disclosure. This contradicts the findings of Hermawan (2018) and Pratiwi (2018), according to which the government influences the disclosure of carbon emissions. These findings indicate that government ownership of state-owned firms and private companies has little effect on the disclosure of carbon emissions statistics in annual reports.

After researchers perform the separation of firm status between state-owned enterprises and private companies, the outcomes of this study are intriguing. According to the findings, state-owned businesses likely to disclose some carbon emissions. In contrast, private enterprises have implemented the disclosure of sufficient carbon emissions.

This problem happens due to the voluntary nature of carbon emission disclosure. The Indonesian business sector, including state-owned enterprises whose majority ownership is controlled by the government, plays a significant role in implementing actions to reduce greenhouse gas emissions; therefore, state-owned enterprises are expected to serve as examples of carbon emissions disclosure.

5.2 Impact of Media Exposure on Disclosure of Carbon Emissions

This study demonstrates that Exposure Media influences Carbon Emission Disclosure. Similar findings were reported by Janah and Muid (2014), Ghazali (2015), and nurmann (2017), who all concluded that media exposure had an impact on carbon emission disclosure. These findings show that the media could impact a company's incentive to voluntarily disclose carbon emissions in its annual report in order to receive good feedback from its stakeholders.

The dynamics between stakeholders and media coverage have a significant impact on voluntary environmental disclosure (Dawkins and Fraas, 2011), hence the results of this study are supported by the stakeholder theory. Similarly, with the legitimacy idea, the disclosure of corporate social responsibility is an attempt to obtain the information from the corporation.

The corporation is concerned when its carbon emission-related operations are reported in the media. If the activity is known to harm the environment, stakeholders will respond negatively to it. Therefore, in order to achieve the legitimacy of the firm's stakeholders, the company must: Choose to disclose information on carbon emissions through the Annual report, the Sustainability Report, the firm website, and other channels.

5.3 Influence of firm size on Carbon Emission Disclosure

This study demonstrates that company size influences Carbon Emission Disclosure. The findings were consistent with those of Choi et al. (2013), Hermawan et al. (2018), and Kurniawati & Biduri (2017), who found that the size of the company influences Carbon Emission Disclosure. Large firms will produce greater carbon emissions, including those from operational operations, machinery, automobiles, and other carbon-emitting activities.

Consequently, the research links to the notion of legitimacy, as the vast community exerts greater pressure on the public regarding environmental issues, resulting in a higher environmental reaction. Therefore, the corporation must respond to these pressures by disclosing its actions, particularly their carbon emission activities. Larger companies with more resources are more likely to submit a qualified voluntary disclosure in order to achieve credibility and divulge specific information regarding carbon emissions.

5.4 Impact Carbon Emission Disclosure

This study demonstrates that Leverage has no impact on Carbon Emission Disclosure. The study contradicted the findings of Jannah and Muid (2014), who concluded that leverage has a favorable influence on the disclosure of carbon emissions. According to additional research by Ghozali (2015), leverage negatively impacts carbon emissions disclosures.

This implies that high levels of leverage have no effect on the reporting of environmental information, including carbon emissions, in the Annual report. A healthy relationship between the company and its Debtholders is the primary reason why the corporation does not feel the need to provide additional environmental information (Pratiwi, 2017). Debtholders pay little attention to whether or whether the company has adequately disclosed its carbon emissions, focusing instead on financial concerns. Additionally, high debt exerts pressure on the corporation to prioritize economic concerns over social and environmental ones. In addition, enterprises with high or low leverage should exercise caution when disclosing carbon emissions, as doing so will increase operational costs and be a burden on the organization (Dewi et al., 2019).

5.5 The influence of profit on Carbon Emission Disclosure

This study demonstrates that profitability has no influence on Carbon Emission Disclosure. This research concurs with Pratiwi's (2018) conclusion that profitability has no bearing on the Carbon Emission Disclosure. In contrast, Ansyah et al. (2018) and Kurniawati and Biduri (2017) state that Carbon Emission Disclosure is influenced by a company's profitability.

This suggests that a company's profitability does not ensure a comprehensive disclosure of carbon emissions. This is evidenced by the fact that companies such as PT. Astra International Tbk have a high value of profitability but a low value of disclosure, in contrast to PT. Citra Tubindo TBK, which has a low value of profitability and even suffered losses, but a high value of disclosure of carbon emissions. PT. Merck TBK has a high profitability value and a high level of transparency. Inconsistencies are one of the reasons why profitability has no effect on carbon emission disclosure. Companies with significant profitability are required to disclose carbon emissions in a more comprehensive manner, which can give a positive image and add value.

Thus, the findings does not support the legitimacy argument suggesting that corporations with high profitability are more resistant to pressure than firms with low profitability because they devote more resources to environmental disclosure. According to Pratiwi (2018), businesses with low profitability typically disclose their carbon emissions to attract investors.

6. CONCLUSIONS AND SUGGESTIONS

Based on the results of research on the influence of Government Ownership, media exposure, company size, leverage, and profitability of carbon emission disclosure it can be concluded that the Media Exposure and size of the company have a significant positive influence on carbon emission disclosure, while Government Ownership, Leverage and profitability have no significant influence on carbon emissions' disclosures.

Stake research should be done by establishing the same variable with different research samples originating from different sectors separating the mining sector and with a greater number of samples to be obtained more accurate results so that it can be considered by the comparison of the results from each study. In this study almost half of the overall total Sample still has not made the disclosure of carbon emissions. With this research is expected that the company can be more concerned about the importance of information about the environment, especially carbon emissions as a base for reducing carbon emissions generated by the company to directly contribute to the problems of global warming. Companies with greater profitability should be able to phrase carbon emissions more broadly because they can make investors more aware of how their money is being used.

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