Factors influencing the carbon emissions disclosure in basic and chemical industrial companies listed on the IDX in 2016-2019

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ABSTRACT

This study aims to determine the factors influencing carbon emissions disclosure in basic and chemical industrial companies listed on the IDX in 2016-2019. The research approach used in this study is a quantitative approach of the Exploratory Research type to explain the relationship between the independent and dependent variables through hypothesis testing. The sample selection was used using a purposive sampling method with the following criteria. Data in the form of financial reports and company annual reports were obtained from the website of the Indonesia Stock Exchange ICMD (Indonesian Capital Market Directory), and www.finance.yahoo.com. The data used in this study are time series and cross-section data. Based on the research that has been done, it can be concluded that the Good Corporate Governance variable has a positive and significant effect on Carbon Emissions Disclosure; Managerial Ownership Variables have a negative and significant effect on Carbon Emissions Disclosures; Firm Value Variables do not affect Carbon Emissions Disclosures, Leverage Variables do not affect Carbon Emissions Disclosures, Company Size Variables have a positive and significant effect on Carbon Emissions Disclosures, Good Corporate Governance Variables, Managerial Ownership, Firm Value, Leverage and Firm Size jointly influence Carbon Emissions Disclosure. The results of this study can provide information for regulators, company management, investors, creditors, and other interested parties to understand the importance of the supervisory function in a company.

Introduction

In the official website of World Wide Fund for Nature (WWF) entitled “Causes of Global Warming” explains global warming as an event of increasing the earth's average temperature caused by increasing levels of greenhouse gases (GHG) in the atmosphere and caused by human activities, such as burning fossil fuels, deforestation, and livestock farming. (https://www.wwf.org.au). The Intergovernmental Panel on Climate Change (IPCC) explains on its official website in a page entitled “Global Warming of 1.5°C” that human activity has caused an increase of 1.0°C in the last 30 years and is likely to reach 1.5°C in 2030-2052. In addition, the page also states that the average temperature of the earth’s surface in the decade 2006-2015 reached 0.87°C (probably between 0.75°C-0.99°C), and continue to progress (https://www.ipcc.ch/sr15/). In 2017, according to (Enerdata, 2018), Indonesia experienced an 18% increase in CO2 emissions during 2012-2017. This emission increase is from power plants, the industrial, and transportation sector (Climate Transparency, 2018).

As the industry grows rapidly, its impact on the environment is becoming more obvious. The negative impacts can be felt in almost all parts of the world and have an impact on nature and the preservation of living things. The existence of forests that previously functioned to absorb CO2 gas has been converted into industrial land which instead produces CO2 gas. This conversion causes natural conditions to worsen due to an increase in carbon gas released into the air, while the forest as a carbon sink itself decreases. As a result, the problem of global warming is currently getting worse, one of which can be seen from the temperature on the earth's surface that is getting hotter. Researchers use Carbon Disclosure Index (CDI) index to measure the disclosure of carbon emissions. CDI is an

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index of measuring carbon emissions developed by (Tang et al., 2020). According to Zhang et al. (2022), companies that carry out Carbon Emission Disclosures have several considerations, including to gain legitimacy from stakeholders, avoid threats, especially for companies that produce greenhouse gases (greenhouse gases) such as increasing operating costs, reducing demand (reduced demand), reputational risk, legal proceedings, as well as fines and penalties.

Disclosure of carbon emissions can legitimize company activities and create Good Corporate Governance (GCG). GCG is a structure that regulates the pattern of harmonious relationships regarding the roles of the board of commissioners, directors, shareholders, and other stakeholders. GCG can be realized if the company fulfills the principles of transparency, accountability, responsibility, independence and fairness, and equality. In this case, emission disclosure can be used as an effort to realize these principles (Sulbahri & Fuadah, 2022).

Companies that implement good governance will certainly carry out maximum control and supervision of their company's performance. The condition of corporate governance is expected to influence the level of disclosures made by companies, including environmental disclosures. This is in accordance with the opinion of (Kılıç & Kuzey, 2018) that companies with better governance tend to make full disclosures. Tila & Agustine (2019) in their research on Australian companies also revealed that the variable quality of good corporate governance (GCG) has a positive effect on disclosure of carbon emissions.

The second factor is managerial ownership. The presence of the manager as the owner of the company encourages managers to increase the credibility of the company. Research by (Wiratno & Muaziz, 2020) show the tests conducted on a sample of companies match the criteria and show that only the leverage variable has an influence on the disclosure of carbon emissions. In addition, the research of (Hapsari & Prasetyo, 2020) found that the variables that had a significant influence on the level of disclosure of carbon emissions were company size and leverage, while profitability and corporate governance variables were found to have no significant effect. The results of another study belonging to (Bhattarai et al., 2018) reveal that leverage has no significant effect on carbon.

Other than that, (Wiratno & Muaziz, 2020)’s research shows that company size has failed to prove that it affects disclosure of carbon emissions, but the results of research by (Azmi, 2021) reveal that company size influences carbon emissions. The results of (Bhattarai et al., 2018) show that company size has a positive and significant effect on disclosure of carbon emissions.

Furthermore, (Andrian & Kevin, 2021) revealed that financial performance was found to have a significant positive effect on the level of disclosure of carbon emissions. Based on the results of the research above where there is a research gap where there is a difference in the research (Amaliyah & Solikhah, 2019) examine the effect of environmental performance and characteristics corporate governance on disclosure of carbon emissions, while in the current study the researchers added several differentiating variables, namely managerial ownership, leverage and firm value and company size, apart from that there were still research results that were different from the research by (Wiratno & Muaziz, 2020) with (Damayanti et al., 2018). In addition, the research results of (Wiratno & Muaziz, 2020) are also different from (Damayanti et al., 2018) regarding company size.

In this study, the basic industrial and chemical companies are used because the basic and chemical industries have stable financial reports and the basic industrial and chemical sector companies are sectors that have an important role in the Indonesian economy. Therefore, the researcher is interested in the research subjects of basic industry and chemical companies. The basic industry and chemical companies involved in this research is placed in Indonesia obtained from the Indonesia Stock Exchange (IDX) in the period of 2016 to 2020 or whose IPOs are under 2016.

**Literature Review**

**Empirical Review and Hypothesis Development**

*The Effect of Good Corporate Governance (GCG) on Carbon Emissions Disclosure*

Corporate governance has an important role in making decisions regarding the disclosure of information. It relates to the principle of corporate governance, namely transparency. The board of directors as one of the organs of corporate governance, has the responsibility to develop a sustainable business strategy so it is necessary to ensure that the impact of company activities on the environment that has material risks is properly monitored and fully disclosed (Ben-Amar et al., 2017). In addition, (Amaliyah & Solikah, 2019) show that the results of the study show that good corporate governance has a positive and significant effect on disclosure of carbon emissions.

*Effect of Managerial Ownership on Carbon Emissions Disclosure*

Managerial ownership is a proportion of share ownership owned by a managerial or management of all managed shares (Kusumawati & Setiawan, 2019). Managerial ownership can reduce existing agency costs because it can equate or align management interests with other stakeholders (Jensen & Meckling, 2019). On the other hand, Lumapow (2018) also explained that a manager who owns a high percentage of company shares bears the consequences of managerial actions, thereby functioning to align the interests of the manager with the interests of the owner. Zhou (2019) states that a company that has a high proportion of managerial ownership will tend to have a higher voluntary disclosure.
The more managerial ownership, the less agency conflict, where managers will participate in making decisions and tend to act like a company owner. It means that managers will make more decisions and consider things that are good for the continuity of the company which will cause the company better in the eyes of stakeholders, attract the attention of investors, and to gain community legitimacy (Wiranudirja et al., 2022). It can be carried out by making voluntary disclosures by disclosing carbon emissions (Chen et al., 2021).

The Effect of Company Value on Carbon Emissions Disclosure

The value of the company has an important role. It is because the main goal of the company in carrying out its activities is to maximize the value of the company (Agudelo et al., 2019). The trend and social awareness that is environmentally friendly turns out to have its own impact on business people. Stakeholders consider that profit is no longer the only thing to pay attention to in running a business (Nurdin & Hartati, 2019). Investors will think about investing if the company has a good responsibility towards the environment considering that climate change has become a global issue that must be considered (Ramadan et al., 2018).

Research by Gerged et al. (2021) stated that disclosure of carbon emissions has a positive effect on the market value of equity. Research by Buallay (2018) stated that there was a positive reaction in the stock market when additional reports related to sustainability were published. According to Utomo et al. (2020) also found that there is a positive influence between environmental disclosure and company stock value because environmental issues are more important to investors. According to Gerged et al. (2021), environmental disclosure has a positive effect on firm value by proxy Tobin's Q.

Effect of Leverage on Carbon Emissions Disclosure

The higher the company's leverage level, the higher creditors' expectations of company performance, including its environmental performance, because environmental performance has an impact on the sustainability of company operations (Digdowiseiso et al., 2022). Companies with high leverage will result in management to reduce costs in disclosing information. Companies will prefer not to disclose much information in their annual reports, especially regarding carbon precautions. Making this voluntary report requires a large fee so that it can add to the company's burden. So the company focuses more on using its available funding sources to pay off these debts. This term, of course, can trigger a negative view of the stakeholders towards the business of the company (Albarrak et al., 2019).

With a good financial position, companies have more opportunities to report their carbon footprint using their human and financial resources. Carbon emission disclosures can add value to the company in the market (Hardiansyah et al., 2021). Danso et al. (2019) are of the same opinion, companies with poor financial performance will focus on improving performance and achieving financial goals, thereby limiting their ability to prevent and report carbon emissions. Several studies conducted to examine the effect of leverage on the disclosure of carbon emissions that support the stakeholder theory are research conducted by Faisal et al. (2018) and Widianto & Sari (2020) which state that there is a negative effect of leverage on the disclosure of carbon emissions.

Effect of Company Size on Carbon Emissions Disclosure

The bigger the company, the more visible its operational activities, as well as the contribution to the surrounding environment, it will be very easy for certain parties, both politically and economically motivated, to put pressure on the company to pay more attention to environmental problems (Li et al., 2020). Company size is often used as a measure of how a company's activities affect its environment. The larger the size of the company or the higher the visibility of the company, the higher and wider the disclosure of carbon emissions will be reported. Because large companies have high operational activities, this results in a lot of emissions resulting from these activities and disrupts the community and the environment around the company (Nasution et al., 2021).

Research conducted by Kilic & Kuzey (2018), Luo (2019), and Pratiwi & Sari (2016), which states that company size has a positive effect on disclosure of carbon emissions. Large companies are expected to provide more disclosure of carbon emissions. Based on the description of the relationship between the variables above, this researcher describes a hypothetical framework to make it easier for readers to understand, the hypothetical framework in this study can be seen in the following.

Figure 1: Hypothesis Framework
Based on the hypothetical framework, the research concludes the hypothetical framework as follows:

H1: Good corporate governance has a significant effect on disclosure of carbon emissions
H2: Managerial ownership has a significant effect on disclosure of carbon emissions
H3: Firm value has a significant effect on disclosure of carbon emissions
H4: Leverage has a significant effect on disclosure of carbon emissions
H5: Company size has a significant effect on disclosure of carbon emissions

Research and Methodology

The research approach used in this research is a quantitative approach. Furthermore, this type of research is explanatory research, which explains the relationship between the independent variables and the dependent variable through hypothesis testing. The sample taken for research must be representative which means representing the population whose characteristics are able to be reflected in the sample under study. Selection of the sample used by using purposive sampling method. According to (Sugiyono, 2018), purposive sampling is a sampling technique with certain considerations. The purposive sampling criteria used in this study are as follows.

i. Basic and chemical industry companies listed on the Indonesia Stock Exchange (IDX) in 2016-2020 or companies whose IPOs are under 2016;
ii. Basic and chemical industry companies that have complete data according to research variables.

Table 1: Number of Companies Based on Criteria

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic and Chemical Industry Companies listed on the Indonesia Stock Exchange (IDX) in 2016-2020 or companies whose IPOs are under 2016</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Basic and Chemical Industry Companies that have complete data according to research variables</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: Researchers’ Data Processed, 2022

This type of research data is secondary data. Data in the form of financial reports and company annual reports are obtained from the Indonesia Stock Exchange website (http://www.idx.co.id/), ICMD (Indonesian Capital Market Directory), and www.finance.yahoo.com. The data used in this study are time series and cross section data. Furthermore, pooled data will be carried out in data processing, namely the process of merging time series data with cross section data. It is said to be combined data because this data consists of several objects/sub objects in several time periods. The measurement of each variable is based on the following formula.

Measurement of Good Corporate Governance (GCG) can be done by looking at the percentage of the number of independent commissioners (Ramadhani, 2016). The proportion of Independent Commissioners given the KI symbol is formulated as follows (Mujahidin et al., 2021).

\[ KI = \frac{\text{Total of Independent Commissioner Members}}{\text{Total of All Commissioner Members}} \times 100\% \]

Managerial ownership is the shareholder of the management who actively participates in making company decisions (Dewi et al., 2019). Managerial ownership is formulated as follows:

\[ KM = \frac{\text{Total of managerial shares}}{\text{Total of shares outstanding}} \times 100\% \]

Firm Value

Firm value is an investor’s assessment of how well a company’s condition is; this condition can be reflected through the company’s stock market price (Meidiawati & Mildawati, 2016). Corporate value is formulated as follows.

\[ PBV = \frac{\text{Stock price per share}}{\text{Book value per share}} + 100\% \]

Leverage

Leverage is a measure of the amount of assets financed with debts used to finance assets from creditors (Rofiıkoh & Priyadi, 2016), not from shareholders or investors.

\[ DER = \frac{\text{Total of Debt}}{\text{Total of equity}} \times 100\% \]
Company Size

Company size is a measure of the size of a company which is indicated or assessed by total assets, total sales, total profits, tax burden, etc. (Aulia & Mahpudin, 2020).

Company Size = Ln Total Assets

Carbon Emissions Disclosure

Carbon emission is the release of carbon-containing gases into the earth's atmosphere due to the process of burning carbon. In this study, Carbon Emission Disclosure was measured using several items adopted from the research of (Bae Choi et al., 2013) in (Adiningtyas & Faisal, 2014). Within these five categories, 18 items were identified. The following is a checklist for disclosing carbon emissions shown in table 2 below.

<table>
<thead>
<tr>
<th>Table 2: Carbon Emissions Disclosure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate change: Risks and Opportunities</strong></td>
</tr>
<tr>
<td>CC1: Assessment/Description of risks (both specific and general regulations/regulations) related to climate change and actions taken to manage these risks</td>
</tr>
<tr>
<td>CC2: Current (and future) assessment/description of the financial, business and opportunity implications of climate change</td>
</tr>
<tr>
<td><strong>Calculation of Greenhouse Gas Emissions (GHG/ Greenhouse Gas)</strong></td>
</tr>
<tr>
<td>GHG1: Description of the methodology used to calculate greenhouse gas emissions (eg GHG or ISO protocol)</td>
</tr>
<tr>
<td>GHG2: Presence of external verification of the quantity of GHG emissions in measuring the amount of GHG emissions</td>
</tr>
<tr>
<td>GHG3: Total greenhouse gas emissions (metric tons of CO2-e) produced</td>
</tr>
<tr>
<td>GHG4: Disclosure of scope 1 and 2, or 3 direct GHG emissions</td>
</tr>
<tr>
<td>GHG5: Disclosure of GHG emissions by origin or source (eg: coal, electricity, etc.)</td>
</tr>
<tr>
<td>GHG6: Disclosure of GHG emissions by facility or segment level</td>
</tr>
<tr>
<td>GHG7: Comparison of GHG emissions with previous years</td>
</tr>
<tr>
<td><strong>Energy Consumption</strong></td>
</tr>
<tr>
<td>EC1: The amount of energy consumed (eg tera-joules or MAP-joules)</td>
</tr>
<tr>
<td>EC2: Quantity of energy used from renewable resources</td>
</tr>
<tr>
<td><strong>Greenhouse Gas Reduction (GHG Reduction and Cost)</strong></td>
</tr>
<tr>
<td>RC1: Details of plans or strategies to reduce GHG emissions</td>
</tr>
<tr>
<td>RC2: Specification of the target level and year of GHG emission reductions</td>
</tr>
<tr>
<td>RC3: Emissions reductions and costs or savings achieved today as a result of carbon emission reduction plans</td>
</tr>
<tr>
<td>RC4: Future emission costs taken into account in capital expenditure planning</td>
</tr>
<tr>
<td><strong>Carbon Emission Accountability</strong></td>
</tr>
<tr>
<td>AEC1: Indication of which board committee (or other executive body) has responsibility for action related to climate change</td>
</tr>
<tr>
<td>AEC2: Description of the mechanism by which the board (or other executive body) reviews the company’s progress on climate change</td>
</tr>
</tbody>
</table>

Source: (Bae Choi et al., 2013) in (Adiningtyas & Faisal, 2014)

The analytical method used in this study is regression which aims to examine the influence relationship between one variable on another variable.

Findings and Discussions

Descriptive statistical analysis is statistics used in analyzing data by describing or describing the data that has been collected. According to Bustani et al. (2022), this analysis aims to provide an overview or describe the data in the variables seen from the average (mean), minimum, maximum and standard deviation values.

Descriptive statistics are statistics used to describe data into clearer and easier to understand information that provides an overview of the research in the form of the relationship of independent variables proxied by Good Corporate Governance, Managerial Ownership, Company Value, Leverage and Company Size on Carbon Emissions Disclosure. The results of the descriptive statistical analysis research can be seen in table below.
Table 3: Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Means</th>
<th>std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCG_X1</td>
<td>220</td>
<td>.00</td>
<td>.67</td>
<td>.3763</td>
<td>.12304</td>
</tr>
<tr>
<td>KM_X2</td>
<td>220</td>
<td>.00</td>
<td>.33</td>
<td>.0356</td>
<td>.08407</td>
</tr>
<tr>
<td>PBV_X3</td>
<td>220</td>
<td>-.93</td>
<td>22.14</td>
<td>1.4773</td>
<td>2.30649</td>
</tr>
<tr>
<td>Leverage_X4</td>
<td>220</td>
<td>-1.94</td>
<td>5.36</td>
<td>1.1614</td>
<td>1.15471</td>
</tr>
<tr>
<td>SIZE_X5</td>
<td>220</td>
<td>11.80</td>
<td>18.74</td>
<td>14.7345</td>
<td>1.50999</td>
</tr>
<tr>
<td>CED_Y</td>
<td>220</td>
<td>.17</td>
<td>.56</td>
<td>.3306</td>
<td>.08951</td>
</tr>
</tbody>
</table>

Source of data: Primary data processed (2022)

The normality test aims to test whether the variables are normally distributed in the research model. The normality test results can be seen in the following table:

Figure 2: Normality Test

Figure 2 shows that the dots are around the diagonal line. The dots that spread around the diagonal line show the residuals are normally distributed so that it can be concluded that the residuals between good corporate governance, managerial ownership, firm value, leverage and firm size with respect to carbon emissions disclosures are normally distributed. The results of the multicollinearity assumption test show that multicollinearity does not occur in the model. This can be seen from the correlation matrix between the independent variables in Table 4.

Table 4: Multicollinearity Test

<table>
<thead>
<tr>
<th></th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>VIF</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td></td>
</tr>
<tr>
<td>GCG_X1</td>
<td>.988</td>
</tr>
<tr>
<td>KM_X2</td>
<td>.961</td>
</tr>
<tr>
<td>PBV_X3</td>
<td>.920</td>
</tr>
<tr>
<td>Leverage_X4</td>
<td>.937</td>
</tr>
<tr>
<td>SIZE_X5</td>
<td>.913</td>
</tr>
</tbody>
</table>

Multicollinearity testing can be seen by looking at the VIF and the tolerance value obtained. If the tolerance value is equal to 1 and the VIF value is equal to 1, it can be concluded that there is no multicollinearity. In addition, based on the Glejser test, the following results are shown.
Based on the table above, it can be seen that the sig value in the good corporate governance (x1) variable is 0.664, the managerial ownership variable (x2) is 0.591, the firm value variable (x3) is 0.399, the leverage variable (X4) is 0.658 and the firm size variable (X5) is 0.082. From the results of the Glejser test, it can be concluded that there is no heteroscedasticity problem because the Sig value is greater than 0.05. To diagnose the presence of autocorrelation in a regression model, the Durbin-Watson test value (Dw test) was tested.

**Table 6: Autocorrelation Test Results**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.543a</td>
<td>.295</td>
<td>.278</td>
<td>.07605</td>
<td>2096</td>
</tr>
</tbody>
</table>

Based on the output above, it is known that the DW (Durbin Watson) value is 2.096. Thus, it can be concluded that there is no autocorrelation. Based on table above, the R2 (R Square) number is 0.295. This shows that the percentage of independent variables that consist of Good Corporate Governance, Managerial Ownership, Firm Value, Leverage and Firm Size on the dependent variable Carbon Emissions Disclosure is 29.5%. Or variations of the independent variables used Good Corporate Governance, Managerial Ownership, Firm Value, Leverage and Company size are able to explain 29.5% of the variation in the dependent variable (Carbon Emissions Disclosure). While the remaining 70.5% is influenced or explained by other variables not included in this research model.

Multiple Linear Regression Analysis is intended to determine the effect or relationship of the independent variables Good Corporate Governance (X1), Managerial Ownership (X2), Firm Value (X3), Leverage (X4) and Firm Size (X5) and the dependent variable (Y) in the form of Carbon Emissions Disclosure, so to obtain more accurate results, the author uses the help of the SPSS 25.00 software program from the coefficient table, so the output in table 4.5 is produced.

**Table 7: Multiple Regression Test**

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized</td>
<td>Coefficients</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-.118</td>
<td>.055</td>
</tr>
<tr>
<td>GCG_X1</td>
<td>.169</td>
<td>.042</td>
</tr>
<tr>
<td>KM_X2</td>
<td>-.154</td>
<td>.062</td>
</tr>
<tr>
<td>PBV_X3</td>
<td>001</td>
<td>.002</td>
</tr>
<tr>
<td>Leverage_X4</td>
<td>003</td>
<td>.005</td>
</tr>
<tr>
<td>SIZE_X5</td>
<td>.026</td>
<td>.004</td>
</tr>
</tbody>
</table>

With the help of the Anova table, the results of data processing with the SPSS ver 17 program obtained the following data.
Table 8: F Test Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>.517</td>
<td>5</td>
<td>.103</td>
<td>17.867</td>
<td>.000b</td>
</tr>
<tr>
<td>residual</td>
<td>1,238</td>
<td>214</td>
<td>.006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,754</td>
<td>219</td>
<td>.006</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: CED_Y
b. Predictors: (Constant), SIZE_X5, GCG_X1, Leverage_X4, KM_X2, PBV_X3

Based on the table above, the F-count is 17.867 and sig 0.000. This means that F-count > F-table (17.867 > 2.14) and sig 0.05 (0.000 <0.05), then the hypothesis can be accepted. In this case it can be said that the variables Good Corporate Governance, Managerial Ownership, Firm Value, Leverage and company size together have a significant effect on Carbon Emissions Disclosure, so that the three independent variables can be used to estimate or predict Carbon Emissions Disclosure variables.

Discussion

Good Corporate Governance towards Carbon Emissions Disclosure

corporate governance has an important role in making decisions regarding the disclosure of information. This relates to the principle of corporate governance, namely transparency. The board of directors as one of the organs of corporate governance, has the responsibility to develop a sustainable business strategy so it is necessary to ensure that the impact of company activities on the environment that has material risks is properly monitored and fully disclosed (Ben-Amar et al., 2017). The board of commissioners is part of the company's organs (all members of the board of commissioners) whose job is to supervise and ensure that the company implements good corporate governance. The larger the size of the board of commissioners, the greater the company's ability to carry out corporate social responsibility (Zahra & Siddiqui, 2020). In addition, (Amaliyah & Solikhah, 2019) show that good corporate governance has a positive and significant effect on disclosure of carbon emissions.

Managerial Ownership of Carbon Emissions Disclosure

Managerial ownership is a proportion of share ownership owned by a managerial or management of all managed shares (Kusumawati & Setiawan, 2019). Managerial ownership can reduce existing agency costs because managerial ownership can equate or align management interests with other stakeholders (Jensen & Meckling, 1993). On the other hand, Lumapow (2018) also explained that a manager who owns a high percentage of company shares bears the consequences of managerial actions, thereby functioning to align the interests of the manager with the interests of the owner. Furthermore, Zhou (2019) states that a company that has a high proportion of managerial ownership will tend to have a higher voluntary disclosure. More managerial ownership will reduce agency conflict, where managers will participate in making decisions and tend to act like company owners. It means that managers will make more decisions and consider things that are good for the continuity of the company which will cause the company to be better in the eyes of stakeholders, attract investors' attention and to gain community legitimacy by disclosing carbon emissions (Prafitri & Zulaikha, 2016).

The value of the company towards Carbon Emissions Disclosure

Value is something that is desired. If the value is positive in the sense that it is beneficial or pleasant, it eases the party to fulfill their interests related to the value. Conversely, value is something that is undesirable if the value is negative in the sense of harming or making it difficult for the party who obtains it to influence the interests of the party so that the value is shunned (Haslam et al., 2020). According to Brimingham, the value of the company has an important role, because the main goal of the company in carrying out its activities is to maximize the value of the company (Agudelo et al., 2019). Firm value is divided into several concepts including nominal value, market value, intrinsic value, book value, and liquidation value. Society will be increasingly aware of the environmental impacts caused by companies in carrying out their operations, such as air pollution. The trend and social awareness that is environmentally friendly turns out to have its own impact on business people. Stakeholders consider that profit is no longer the only thing to pay attention to in running a business (Nurdin & Hartati, 2019). Investors will invest their money if the company has a good responsibility towards the environment considering that climate change has become a global issue that must be considered (Ramadan et al., 2018). The research of Karim et al. (2021) stated that the disclosure of carbon emissions has a positive effect on the market value of equity. The research of Buallay (2018) stated that there is a positive reaction in the stock market when additional reports related to sustainability are published. Ali et al. (2019) also found a positive influence between environmental disclosure and the value of the company's shares because environmental issues are more important for investors. According to Gerged et al. (2021), environmental disclosure has a positive effect on firm value using Tobin's Q proxy.

Leverage towards Carbon Emissions Disclosure

Leverage is a measuring tool to determine the ratio between the total debt to the company's total assets. Leverage indicates the percentage of use of funds from creditors to finance company assets. The company's decision is very dependent on the leverage
conditions experienced by the company. If the condition of the company's leverage is greater, the greater the power of creditors in suppressing the company. Haddad et al. (2020) argue that companies with high leverage tend to pay off their obligations compared to making voluntary disclosures. Therefore, the higher the leverage of the company, the smaller the company will disclose carbon emissions, while the smaller the leverage of the company, the greater will be the company's disclosure of carbon emissions. In the stakeholder theory, companies with a high level of leverage will consider the company's large responsibility to its creditors by paying its obligations to debtholders rather than making reports related to the disclosure of carbon emissions. The higher the company's leverage level, the higher creditors' expectations of company performance, including its environmental performance, because environmental performance has an impact on the sustainability of company operations. Companies with high leverage will result in management to reduce costs in disclosing information. Companies will prefer not to disclose much information in their annual reports, especially regarding carbon precautions. Making this voluntary report requires a large fee so that it can add to the company's burden. Thus, the company focuses more on using its available funding sources to pay off these debts. This of course can trigger a negative view of the stakeholders towards the business of the company. With a good financial position, companies have more opportunities to report their carbon footprint using their human and financial resources. Carbon emission disclosures can add value to the company in the market (Hardiansyah et al., 2021). At the same opinion stated by Secinaro et al. (2020), companies with poor financial performance will focus on improving performance and achieving financial goals, thereby limiting their ability to prevent and report carbon emissions.

**Company Size towards Carbon Emissions Disclosure**

The size of the company is a scale where the size of the company can be classified according to various ways, including total assets, long size, stock market value, and others. Basically, the size of the company is only divided into three categories, namely large firms, medium firms, and small firms. The bigger the company, the more visible its operating activities are, as well as the contribution to the surrounding environment. It will be very easy for certain parties, both politically and economically motivated, to put pressure on the company to be more serious in paying attention to environmental problems (Li et al., 2020). One way to respond to this pressure is by transparently disclosing information about emissions to the public so that people believe that the company deserves legitimacy from the community. The size of the company is often a measure of how the company's activities affect the environment. The larger the size of the company or the higher the visibility of the company, the higher and wider the disclosure of reported carbon emissions will be. Because large companies have high operational activities, this creates a lot of emissions resulting from these activities and disturbs the community and the environment around the company. In accordance with the legitimacy theory that large companies will be the main focus of the community, the activities carried out by the company have an impact on the environment. The greater the company's operational activities, the greater the impact of these activities. Thus, large companies get greater public pressure to demonstrate their environmental social responsibility compared to small companies. Large companies are assumed to be capable in terms of resource availability to meet costs related to carbon emission disclosures, while smaller companies tend not to disclose carbon emissions. It is because small companies have limited funds which are an obstacle for companies to disclose information related to carbon emissions.

**Good Corporate Governance, Managerial Ownership, Firm Value, Leverage, and Firm Size on Carbon Emissions Disclosure**

Corporate governance has an important role in making decisions regarding the disclosure of information. This is related to the principle of corporate governance, namely transparency. The board of directors as one of the organs of corporate governance, has the responsibility to develop sustainable business strategies so it is necessary to ensure that the impact of company activities on the environment that have material risks is properly monitored and fully disclosed (Ben-Amar et al., 2017). Managerial ownership is a proportion of share ownership owned by a manager or management of all managed shares (Kusumawati & Setiawan, 2019). Managerial ownership can reduce existing agency costs because managerial ownership can equate or align management interests with other stakeholders (Jensen & Meckling, 2019). Value is desired goal by companies. If the value is positive in the sense that it is beneficial or pleasant, it eases the party to fulfill his interests related to the value. Conversely, value is something that is undesirable if the value is negative in the sense of harming or making it difficult for the party who obtains it to influence the interests of the party so that the value is shunned (Haslam et al., 2020). Leverage is a measuring tool to determine the ratio between the total debt to the company's total assets. Leverage indicates the percentage of use of funds from creditors to finance company assets. The company's decision is very dependent on the leverage conditions experienced by the company. If the condition of the company's leverage is greater, the greater the power of creditors in suppressing the company. Haddad et al. (2020) argue that companies with high leverage tend to pay off their obligations compared to making voluntary disclosures.

The size of the company is often a measure of how the company’s activities affect the environment. The larger the size of the company or the higher the visibility of the company, the higher and wider the disclosure of reported carbon emissions will be. Because large companies have high operational activities, this creates a lot of emissions resulting from these activities and disturbs the community and the environment around the company. Research conducted by (Amaliyah & Solikah, 2019), (Saka & Oshika, 2014), (Guidry & Patten, 2010), (Qi et al., 2014), (Zhang et al., 2012), (Bae Choi et al., 2013), (Borghesi-Ghomi & Leung, 2013), (Jannah & Muid, 2014), (Suhardi & Purwanto, 2015), and (Pratiwi & Sari, 2016) shows that good corporate governance, managerial ownership, firm value, leverage, and company size jointly affect carbon emissions disclosure.
Conclusions

Based on the research conducted, it is concluded that the good corporate governance variable has a positive and significant effect on carbon emissions disclosure; managerial ownership variables have a negative and significant effect on carbon emissions disclosures, firm size variable has no effect on carbon emissions disclosures, leverage variables have no effect on carbon emissions disclosures, company size variables have a positive and significant effect on carbon emissions disclosures, good corporate governance variables, managerial ownership, firm value, leverage, and firm size jointly influence carbon emissions disclosure. The results of this study can provide information for regulators, company management, investors, creditors, and other interested parties to understand the importance of the supervisory function in a particular company.

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