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The Effect of Good Corporate Governance Characteristics on Carbon Emission Disclosure in Carbon Intensive Industry

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Abstract

This study examines the effect of good corporate governance characteristics, namely managerial ownership, institutional ownership, environmental committee, board size, independent commissioners, gender diversity, and CEO duality, on carbon emissions disclosure. This study used a quantitative approach, utilizing secondary data sourced from annual reports and sustainability reports from the energy, industry, materials, and transportation sectors. The sample observation period in this study is from 2018 - 2022. The sampling method uses purposive sampling to obtain a final sample of 26 companies. The selection of analytical technique involves panel data regression analysis utilizing the selected random effect model. The analytical tool used in this purpose is Eviews 12. The findings of this study indicate that variables such as management ownership, institutional ownership, board size, independent commissioners, and gender diversity did not have a significant effect on carbon emissions disclosure. Furthermore, the presence of environmental committees and the practice of CEO duality were found to have a significant positive effect on the disclosure of carbon emissions. Also, the findings of this study indicate that the effect of firm size on the relationship between good corporate governance characteristics and carbon emission disclosure is limited to that of a predictor rather than a mediator.

Keywords: carbon emissions disclosure, good corporate govarnance, carbon intensive industry, CEO duality, climate change

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1. INTRODUCTION

The examination of global warming and climate change holds significant importance when viewed through a business lens, as Kihiko & Kinoti (2016) have posited that the impacts of climate change extend beyond the agricultural sector to several other sectors within the corporate realm. Furthermore, climate change has an impact on corporate survival and growth. This is confirmed by Ozili (2020) research, which claims that climate change generates uncertainty in business. Climate change is a consequence of global warming, mostly produced by the greenhouse effect resulting from the existence of compounds like carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons in the atmosphere. Carbon emissions have been recognised as the primary cause of observed global warming among these gases (Friedlingstein et al., 2022).

Indonesia is among the world's greatest carbon emitters, ranking among the top 10 (Crippa et al., 2022). As a result, Carbon Emissions Disclosure (CED) is critical for businesses to demonstrate their contribution to lowering carbon emissions from their operational activities. It is also an endeavor on the part of the corporation to provide openness and accountability for the impact of its commercial activities on global warming and climate change. The Sustainability Report (SR) includes CED. Although many corporations have issued SR, not all have revealed carbon emissions. Because CED is part of the SR, it is critical to investigate CED better so that stakeholders understand the repercussions of business operations and may adopt policies to mitigate the impacts (Jannah et al., 2021).

The primary aim of this study is to examine the level of carbon emissions disclosure within the Indonesian setting. The current field of research has primarily concentrated on investigating the relationship between carbon emission disclosure and firm value. However, there is still a necessity to delve deeper into this topic within the specific context of Indonesia.. (Deswanto & Siregar, 2018; Hapsoro & Falih, 2020; Damas et al., 2021; Hardiyansah et al., 2021; Rachmawati, 2021; Noor & Ginting, 2022; Wenni Anggita et al., 2022). Furthermore, numerous studies have been undertaken to explore the correlation between carbon emissions disclosure and company financial performance, including profitability, leverage, liquidity, and other performance (Rokhmawati et al., 2015; Nishitani et al., 2017; Rossi et al., 2017; Faisal et al., 2018; Hermawan et al., 2018; Andrian & Sudibyo, 2019; Nasih et al., 2019). There are also few studies on market reactions to the carbon emission disclosure (Firmansyah et al., 2021; Asyari & Dianwicaksih Arieftiara, 2022). These studies mostly address the implications of carbon emission disclosure for businesses, such as the impact on company value, financial performance, or investor reactions when making

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investment decisions. However, research on the determinants of carbon emission disclosure in Indonesia is insufficient, particularly in regards to the influence of good corporate governance characteristics on companies' choices to disclose carbon emissions (Nasih et al., 2019; Astari et al., 2020; Eka Chandra Pramuditya & Budiasih, 2020; Kurnia et al., 2020; Andrian & Kevin, 2021; Blesia et al., 2023).

Moreover, This research tries to reassess the effect of good corporate governance (GCG) characteristics on carbon emissions disclosure (CED) due to the inconsistent findings of previous studies. In a recent study, Kılıç & Kuzey, (2019) discovered that board size had no significant impact on CED. This is inversely related to He et al., (2019); Riantono & Sunarto, (2022) who argue that the larger the board of directors, the greater the degree of CED. According to Elsayih et al., (2018), they found that managerial ownership has a significant and positive impact on CED. These findings differ from those of Solikhah et al., (2021), who determined that managerial ownership does not have an effect on CED. Because of the above statements, research on the effect of Good Corporate Govarnance (GCG) characteristics on Carbon Emissions Disclosure (CED) is interesting to be reexamined.

This study differs from prior studies in incorporating the CEO duality component into GCG features in its impact on carbon emissions disclosure. Due to a lack of data, Ardian Perdana & Anshori, (2022) argue that role duality cannot be investigated in Indonesia. However, at the moment, role duality is normally mentioned in the annual report so that data can be gathered for research purposes. A corporation exhibits CEO duality if someone holds multiple jobs simultaneously (Iwasaki, 2009). in addition to the boards of directors and commissioners serving in various companies. This study also uses a distinct definition of duality, stating that duality exists if the boards of directors and commissioners are still related (Murhadi, 2009). The findings of this study are also intended to contribute empirical data to previously completed investigations.

This study also considers the use of moderating variables to determine the role of these moderating variables on the effect of GCG characteristics on CED. The moderating variable used is company size. In addition, the data used in this study is more diverse. It comes from more than one industrial sector, namely the energy, industrial, material, and transportation sectors, where these industries have a carbon footprint that has a major effect on climate change because their business activities produce large carbon emissions.

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2. LITERATURE REVIEW

GCG characteristics are divided into internal and external mechanisms of the company (Mahrani & Soewarno, 2018). The GCG characteristics used in this study are sourced from external companies, including managerial ownership, institutional ownership, and independent board of commissioners Hatane et al., (2019). In addition, based on Kılıç & Kuzey, (2019) GCG is also proxied by board size and gender diversity. Meanwhile, CEO duality is considered in this study because it makes GCG practices unfavorable and GCG implementation inefficient because there is no separation of functions between managers and supervisors (Shrivastav, 2016).

According to stakeholder theory, it is imperative for the organization to ensure that the decisions made are accompanied with benefits for the stakeholders involved. In conducting business activities, companies do not only make decisions for themselves (Cornell & Shapiro, 1987). However, considering interested parties, both external and internal to the company, such as shareholders, creditors, debtors, employees, suppliers, communities, and governments. The company endeavors to cultivate positive relationships with stakeholders by demonstrating its commitment to social responsibility through the disclosure of carbon emissions associated with its operations. (Nasih et al., 2019). In addition, as explained by Kurnia et al., (2020), the issue of climate change makes people, as part of stakeholders, interested and ultimately tries to encourage companies to disclose carbon emissions, which are one of the causes of climate change. Therefore, this theory explains phenomena related to variables that may influence the carbon emissions disclosure.

Stakeholder theory is also related to legitimacy theory. The desire of an organization or company to be recognized or accepted by society based on its existence is a legitimization process. As expressed by Dowling & Pfeffer, (1975), organizations or companies try to adjust the value of their business activities to the rules that exist in the social system so that the activities carried out can be considered legitimate and under the goals of society.

The research conducted by Elsayih et al. (2018) provides evidence supporting the notion that percentage of managerial ownership has a significant and positive effect on the level of expansion found in carbon emissions disclosure. Information about carbon emissions is disclosed more when there is more share ownership by management, as said by Budiharta & Kacaribu, (2022). This happens because management, as the controlling decision maker, if it owns more shares, can contribute to increasing the amount of carbon information the company discloses (Akhiroh & Kiswanto, 2016).

H1: Managerial ownership has a positive effect on CED

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Management's decision to report their carbon emissions footprint is positively correlated with the concerted efforts of domestic institutional investors to encourage such disclosure (Wegener et al., 2013). In addition, as Döring et al. (2023) said, foreign institutional ownership can also improve the quality and scope of carbon emissions disclosure in the company. Supported by research results (Liesen et al., 2015), companies with a higher concentration of institutional ownership investors are likely to experience pressure to disclose carbon emissions resulting from business activities. So, based on this description, institutional ownership positively influences the carbon emissions disclosure (Amaliyah & Solikhah, 2019; Solikhah et al., 2021).

H2: Institutional ownership has a positive effect on CED

Companies with environmental or sustainability committees are more likely to disclose carbon emissions. As Peters & Romi, (2014) confirmed, an environmental committee can provide a positive relationship to carbon emissions disclosure. For companies that disclose, their corporate governance is stronger. One is indicated by forming an environmental committee, which characterizes most companies that make disclosures (Hollindale et al., 2019). This is supported by research conducted by Liao et al., (2015) and Fahad & Rahman, (2020), which provide evidence that the existence of an environmental committee and sustainability committee can provide a positive relationship in sustainable reporting decisions regarding carbon emissions and the level of disclosure made as Kılıç & Kuzey, (2019) shown that the reporting of carbon emissions and the presence of an environmental committee are positively correlated.

H3: Environmental committee has a positive effect on CED

Board size positively affects the level of carbon emissions disclosure (Liao et al., 2015; Yunus et al., 2016; Riantono & Sunarto, 2022). The larger the board of directors, the more diverse opinions will arise regarding matters that must be disclosed. Also supported by research conducted by Nasih et al., (2019), larger board size positively impacts carbon emissions disclosure because disclosure is carried out at a higher level. Supported by Andrian & Kevin, (2021) the board of directors has an important role regarding environmental disclosure because it is the board of directors who knows the problems experienced by the company. In addition, the extent of carbon emissions disclosure is also influenced by the size of the company's board of directors (Giannarakis et al., 2017).

H4: Board size has a positive effect on CED

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The presence of a larger percentage of independent commissioners can exert a favorable effect on the carbon emissions disclosure. It indicates that there is a positive correlation between the proportion of independent commissioners on board of commissioners and the likelihood of firms disclosing their carbon emissions (Kılıç & Kuzey, 2019; Trufvisa & Ardiyanto, 2019; Solikhah et al., 2021). The board of commissioners is the highest internal control mechanism overseeing corporate social responsibility disclosures, including carbon emissions disclosures. An independent board of commissioners can exert further pressure on firm management to release information. This is in line with what Mardiana & Irawati, (2019), independent commissioners are the most suitable individuals to effectively perform supervisory functions in order to establish good corporate governance.

H5: The independent board of commissioners has a positive effect on CED

Ummah & Setiawan (2021) Dina (2012) states that having a diverse gender composition on the board of directors can enhance the range of knowledge and perspectives available, hence incentivizing management to increase the level of voluntary disclosure. The existence of female directors plays an important role in making bolder, forward-looking, and more ethical decisions (Saraswati et al., 2021). According to Liao et al., (2015) women are said to be more concerned about the environment than men. This concern can affect voluntary disclosures regarding the environment, including the disclosure of carbon emissions. Therefore, the number of women on the board of directors affects the level of disclosure of carbon emissions. Supported by Hossain et al., (2017) explained that companies that have more female directors on the board of directors can achieve higher carbon performance and voluntarily provide carbon information requested by CDP; a positive correlation has been shown between gender diversity and the carbon emissions disclosure. (Ben-Amar et al., 2017; Tingbani et al., 2020; Nuber & Velte, 2021; Kim, 2022).

H6: Gender diversity has a positive effect on CED

CEO duality in the company is considered to result in poor governance, so it needs to follow good corporate governance (Oware, 2022). However, based on research conducted by Elsayih et al. (2021) CEO duality can assist companies in improving decision-making efficiency and introducing more strategic changes in management procedures. In line with the stewardship theory that can be used to explain this phenomenon, in Davis et al., (1997) CEO duality is seen to increase the influence and leadership of the CEO so that decision-

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making lies in one command, which ultimately makes decisions faster and better. In addition, CEO duality as part of board oversight positively influences carbon emission disclosure, as Arena et al., (2015) stated. This is in line with Fahad & Rahman, (2020) which reveals that CEO duality has a positive influence and can increase disclosure of carbon emissions.

H7: CEO duality has a positive effect on CED

In connection with research (Liesen et al., 2015; Faisal et al., 2018) the greater the firm's size, the more it can increase the disclosure of carbon emissions. The bigger the company, the more varied activities can affect the surrounding environment. There needs to be an effort from the company to preserve the surrounding environment so that the company's performance can be maintained. Companies with larger sizes will try to reduce activities that can have a negative impact on the environment (Mujiani et al., 2019). Therefore, firm size is considered a moderating variable in this study.

H8: Company size can moderate the characteristics of good corporate governance in CED

3. RESEARCH METHOD

The research approach used in this study is quantitative with the type of causality. Data were gathered from companies listed on the Indonesia Stock Exchange (IDX), obtained through the official website www.idx.co.id, as well as the individual websites of each company. The study's sample consists of companies that are listed on the Indonesia Stock Exchange (IDX) and fall under the carbon-intensive industry category according to the Global Industry Classification Standard (GICS). These companies have published annual reports and sustainability reports from 2018 to 2022. The total sample used was 26 companies from the energy, industrial, material, and transportation sectors.

Tabel 1. Sample Selection

No	Sample Criteria	Number of Company
1.	Energy, industrial, materials and transportation sector companies listed on the Indonesia Stock Exchange from 2018 - 2022	203
2.	Companies that do not publish annual reports from 2018 - 2022	(0)

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3.	Companies that do not publish sustainability reports from 2018 - 2022	(177)
Total Samples		**26**
Total Data Observation Period 5 Years		**130**

The carbon emissions disclosure variable was evaluated using the carbon emissions checklist constructed by Bae Choi et al (2013) based on factors identified by the Carbon Disclosure Project (CDP). The list contains 5 categories related to climate change and carbon emissions. Then, it is further divided into 18 indicators, where each disclosure indicator is scored with a measurement calculation index using a dichotomous scale. Each indicator has a value of 1, then the value of each indicator in each company is summed up. If the company discloses all information in its annual or sustainability report, it will get the maximum value of 18. However, if the company does not disclose, it will get a minimum value of 0. Then, the total value obtained is compared with all values by dividing it.

Managerial ownership is the percentage of shares owned by parties making company decisions. Measurement of managerial ownership variables is adopted from the method used by Shan et al (2021) by comparing the total shares owned by all directors with the total shares outstanding.

The percentage of shares held by organizations, governments, agencies, or businesses as institutional owners is known as institutional ownership. Institutional ownership is measured by the proxy used by Amaliyah & Solikhah, (2019) by comparing the total shares owned by institutions with all total shares outstanding.

The environmental committee is formed to manage the environmental risks of the activities carried out by the company against the legitimacy of the community. Thus, the environmental committee will try to reduce the company's carbon emissions. The environmental committee variable is measured using a dummy variable. If the company has an environmental committee, it will be given a value of 1. However, if the company does not have an environmental committee, it will be given a value of 0 (Liao et al., 2015; Yunus et al., 2016).

The size of the board of directors is measured by calculating the total of all boards of directors in the company. On the other hand, the independent commissioner variable is determined by dividing the overall count of independent commissioners by the total count of board commissioners inside the company (Liao et al., 2015; Yunus et al., 2016).

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Gender diversity is the diverse gender composition of the board of directors. This variable is measured using the Blau index. The Blau index is the most appropriate proxy for measuring diversity because there is a value of 0, representing homogeneity. The higher the index value, the better the diversity. The maximum value of this index is 0.5 (Kılıç & Kuzey, 2019).

CEO duality refers to the situation in which an individual within a firm simultaneously holds the positions of both a board of directors member and a board of commissioners member (Iwasaki, 2009). Based on Undang-Undang Nomor 40 Tahun 2007 Tentang Perseroan Terbatas, the company's organizational structure distinguishes the management function (board of directors) and (supervisory board of commissioners) known as the two-tier board. However, based on this description, direct incumbency is impossible in Indonesia. According to Murhadi, (2009), The practice of using a family system to distribute roles between the board of directors and the board of commissioners might be considered as CEO duality in Indonesia, as these two institutions have a familial link. In addition, it can be CEO duality if one person serves in 2 or more companies simultaneously. A dummy variable measures CEO duality. If there is duality, a value of 1 will be given; if there is no duality, a value of 0 will be given (Liao et al., 2015).

This study's moderating variable of company size is measured using the natural logarithm of the company's total assets (Liao et al., 2015). The use of the natural logarithm of total assets is based on the number of assets owned by the company, and the value is so large that mathematical simplification is needed to avoid data that fluctuates excessively. Simplification using this natural logarithm will not change the real value of the company's total assets.

The data analysis method used in this research is panel data regression analysis. Panel data is a combination of cross-sectional and time-series data. The use of panel data regression can control individual heterogeneity. If the study uses panel data without regression, it will risk obtaining biased results because panel data does not control heterogeneity. The information provided in panel data is more varied, collinearity is lower, degrees of freedom are higher, and efficiency is increased (Baltagi, 2005). The main purpose of using panel data regression methods is to overcome the problem of omitted variables. This study used Econometric Views (EViews) version 12 as an analytical tool.

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4. RESULT

4.1. Descriptive Statistic

Managerial ownership variable with the lowest percentage of 0% and the highest percentage of 11.8%. In contrast, the average managerial ownership is 0.05%. The highest percentage was owned by PT Merdeka Copper Gold Tbk in 2019. As for the lowest percentage, for five years from 2018 - 2022, there were six companies whose shares were not owned by management, including PT Solusi Bangun Indonesia Tbk, PT Vale Indonesia Tbk, PT Toba Pulp Lestari Tbk, PT Indocement Tunggal Prakarsa Tbk, PT Bumi Resources Tbk, and PT Elnusa Tbk. The institutional ownership variable has the lowest percentage of 4.7%, and the highest percentage is 100%. The average institutional ownership is 78.8%. The highest and lowest percentages have a large difference, and there are even companies fully owned by institutions, namely PT Bumi Resources Tbk. in 2022. In addition, several companies are almost fully owned by institutions such as PT Waskita Beton Precast Tbk, PT ABM Investama Tbk, PT Astra International Tbk, PT Solusi Bangun Indonesia Tbk, and PT Indocement Tunggal Prakarsa Tbk.

In contrast, the lowest percentage was owned by PT Garuda Indonesia Tbk in 2021. A dummy variable is used to measure the environmental committee variable, with 0 being the lowest value and 1 representing the maximum value. The average value of this variable is fairly low at 0.138 because only 11 companies have environmental committees, and the existence of environmental committees in the majority of companies was formed starting in 2021.

Table 2. Descriptive Statistics

	N	Min	Max	Mean	Std. Dev
CED	130	0.500	0.944	0.798	0.116
X1	130	0%	11.8%	0.05%	1.9%
X2	130	4.7%	100%	78.8%	22.8%
X3	130	0.000	1.000	0.138	0.346
X4	130	3.000	15.000	6.276	2.369
X5	130	16.6%	75%	40.9%	10.5%
X6	130	0%	48.9%	12.3%	16.9%
X7	130	0.000	1.000	0.884	0.320
Z	130	28.566	33.655	30.947	1.097

Source: data processed

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The company's board of directors ranges in size from a minimum of 3 members to a maximum of 15 members. Companies that have the lowest number of boards of directors are PT Indika Energy Tbk, PT ABM Investama Tbk, PT Mitrabahtera Segara Sejati Tbk, PT Petrosea Tbk, and PT Solusi Bangun Indonesia Tbk. Then, the company with the largest board of directors comes from the material sector, namely PT. Chandra Asri Petrochemical Tbk. in 2022. The independent commissioner variable has the lowest percentage of 16.6% and the highest percentage of 75%. The lowest percentage is owned by PT Solusi Bangun Indonesia Tbk. in 2021, and the highest is owned by PT Toba Pulp Lestari Tbk. in 2021 and 2022, where almost all commissioners are independent commissioners. The lowest percentage of gender diversity is 0%, and the highest is 48.9%. During the observation period, 9 companies never had a female board of directors, such as PT Indo Tambangraya Megah Tbk, PT ABM Investama Tbk, PT Medco Energi Internasional Tbk, PT United Tractors Tbk, PT Waskita Beton Precast Tbk, PT Garuda Indonesia Tbk, PT Wijaya Karya Beton Tbk, PT Chandra Asri Petrochemical Tbk, and PT Indocement Tunggal Prakarsa Tbk.

The company, whose board composition is close to diverse, is owned by PT AKR Corporindo Tbk. because the highest diversity value is 50%. A dummy variable is used to measure CEO duality, with 0 representing the lowest value and 1 representing the maximum value. The average value of this variable is fairly high at 0.884, so most companies have CEO duality. When viewed from the observation period 2018 - 2022 against 26 companies. The company that does not have CEO duality at all is PT Toba Pulp Lestari Tbk. Turning to the moderating variable, namely company size, obtained the highest natural logarithm value of 33,655 and the lowest value of 28,566. Then, the average value of this variable is 30,947. The difference between the lowest and highest values is insignificant when viewed from the natural logarithm value. However, if based on the number of assets owned by the company, there is a very large difference. Meanwhile, PT Astra International Tbk. is the company with the largest size, while PT Mitrabahtera Segara Sejati Tbk. is the smallest size.

4.2. Panel Data Regression Model

4.2.1. Chow Test

This test aims to ascertain the optimal model, either the common effect model or the fixed effect model, for estimating panel data.

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Table 3. Chow Test Result

Effect Test	Statistic	d.f.	Prob.
Cross-section F	37.720284	(25,96)	0.0000
Cross-section Chi-square	309.617444	25	0.0000

Source: data processed

Based on table 3, the value of the cross section chi-square probability is smaller than the significance value of 0.00<0.05. Therefore, the chosen model is the fixed effect model.

4.2.2. Hausman Test

This test aims to ascertain the optimal model, either the fixed effect model or the random effect model, for estimating panel data.

Table 4. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.666391	8	0.7926

Source: data processed

Based on table 4, the value of the random cross-section probability is greater than the significance value of 0.79>0.05. Therefore, the chosen model is the random effect model.

4.2.3. Langrange Multiplier (LM) Test

This test aims to ascertain the optimal model, either the common effect model or the random effect model, for estimating panel data.

Table 5. Langrange Multiplier (LM) Test Result

	Test Hypothesis		
	Cross-section	Time	Both
Breussch-Pagan	188.3666	0.001132	188.3678
	(0.0000)	(0.9732)	(0.0000)
Honda	13.72467	-0.033640	9.681022
	(0.0000)	(0.5134)	(0.0000)
King-Wu	13.72467	-0.033640	5.065981
	(0.0000)	(0.5134)	(0.0000)

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Standardized Honda	15.75023	0.356352	7.414701
	(0.0000)	(0.3608)	(0.0000)
Standardized King-Wu	15.75023	0.356352	3.069764
	(0.0000)	(0.3608)	(0.0000)
Gourieroux, et al.	--	--	188.3666
			(0.0000)

Source: data processed

According to table 5, the probability value of the Breusch-Pagan test is higher than the significance level of 0.05. Therefore, the chosen model is the random effect model.

Table 7. Model Testing Conclusions

No	Method	Testing		Result
1	Chow Test	Common effect model vs fixed effect model	Prob. Cross-section Chi-square 0.00 < 0.05	Fixed effect model
2	Hausman Test	Fixed effect model vs Random effect model	Prob. Cross-random 0.79 > 0.05	Random effect model
3	Langrange Multiplier (LM-Test)	Random effect model vs common effect model	Cross-section Breusch-pangan 0.00 < 0.05	Random effect model

Source: data processed

Based on the regression model testing that has been done, the best model that can be used to conduct further regression analysis in this study is the **random effect model**.

4.3. Classic Assumption Testing

The Random effect model is a statistical technique that use the generalised least square (GLS) estimate approach. If this model is used, it is not necessary to satisfy the classical assumption test as the analysis technique employing Generalised Least Squares (GLS) may address the presence of time series autocorrelation and correlation between observations. In addition, the GLS method can also overcome homoskedasticity and

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autocorrelation (Gujarati & Porter, 2009). Therefore, in this study, no classic assumption test was conducted.

4.4. Panel Data Regression Analysis

Based on Table 8, it is known that X1, namely managerial ownership, has a probability value of 0.562> 0.05. It can be concluded that managerial ownership does not affect the carbon emissions disclosure. Consequently, the first hypothesis of this research is rejected.

The X2 variable, institutional ownership, has a probability value of 0.136> 0.05. It can be concluded that institutional ownership does not affect the carbon emissions disclosure. Consequently, the second hypothesis of this research is rejected.

The probability value of variable X3, specifically referring to the environmental committee, is 0.031, which is below than the significance level of 0.05. The effect of the environmental committee on carbon emissions disclosure is significant. The t-statistic value is positive, so the environmental committee's effect is positive. It can be concluded that the environmental committee positively affects the carbon emissions disclosure. This means that the third hypothesis is accepted.

Variable X4, namely board size, has a probability value of 0.091> 0.05. So, the size of the board of directors does not affect the carbon emissions disclosure. This means that the fourth hypothesis is rejected.

Table 8. Regression Result

Variable	Coefficient	t-Statistic	Prob.
Constant	-0.222	-0.577	0.564
X1	-0.424	-0.580	0.562
X2	-0.035	-1.499	0.136
X3	0.024	2.178	0.031
X4	-0.003	-1.702	0.091
X5	-0.046	-0.921	0.358
X6	0.008	0.303	0.762
X7	0.038	2.583	0.011
Z	0.034	2.767	0.006
Adjusted R-squared		0.158568	

Source: data processed

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The variable X5, which represents independent commissioners, exhibits a probability value of 0.358, which is greater than the significance level of 0.05. Based on the available evidence, it can be inferred that the presence of independent commissioners does not have significant effects on the disclosure of carbon emissions. This means that the fifth hypothesis is rejected.

The probability value of variable X6, which represents the gender diversity of directors, is 0.762, which is greater than the significance level of 0.05. Therefore, it would be concluded that gender diversity has no effect on the disclosure of carbon emissions. This means that the sixth hypothesis is rejected.

The variable X7, specifically CEO duality, has a probability value of 0.011, which is less than 0.05. Therefore, it can be inferred that the presence of a CEO duality has an impact on the disclosure of carbon emissions. The positive t-statistic value indicates a positive effect of CEO duality. The evidence suggests that CEO duality has a positive effect on the disclosure of carbon emissions. This means that the seventh hypothesis is accepted.

Variable Z, namely company size, has a probability value of 0.006 <0.05. So, company size is a predictor rather than a moderator because the results of the interaction test between each variable X and Z have insignificant results. This means that the eighth hypothesis is rejected.

4.5 Coefficient Determination Test

According to Table 8, the results of panel data regression analysis of carbon emissions disclosure and the effect of good corporate governance characteristics such as managerial ownership, institutional ownership, environmental committee, board size, independent commissioners, gender diversity, and CEO duality can simultaneously affect carbon emissions disclosure by 15.8% with a significance level of 5%.

Tabel 9. Summary of Hypothesis Testing Results

No	Effect	Hypothesis	Description
1	X1 to Y	H1	Rejected
2	X2 to Y	H2	Rejected
3	X3 to Y	H3	**Accepted**
4	X4 to Y	H4	Rejected
5	X5 to Y	H5	Rejected
6	X6 to Y	H6	Rejected

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7	X7 to Y	H7	**Accepted**
8	Z moderates X1, X2, X3, X4, X5, X6, X7 to Y	H8	Rejected

Source: data processed

5. DISCUSSION

5.1. The Effect of Managerial Ownership on Carbon Emission Disclosure

Managerial ownership is one of the variables that can positively influence the carbon emissions disclosure by companies (Akhiroh & Kiswanto, 2016; Elsayih et al., 2018; Shan et al., 2021; Budiharta & Kacaribu, 2022). Based on Shan et al., (2021) research, increasing managerial ownership in the company can positively influence the disclosure and reporting of financial and environmental information carried out voluntarily. This means that the higher the level of managerial ownership, the more carbon information is disclosed.

The results of this test are not in line with the hypothesis formulated in H1. However, it aligns with research (Chithambo & Tauringana, 2017; Lagasio & Cucari, 2019; Solikhah et al., 2021). Solikhah et al., (2021) found no effect of managerial ownership on the carbon emissions disclosure because an increase in managerial ownership in the company did not spur management to disclose carbon emissions. Management tends to prioritize improving company performance over disclosing carbon emissions because their performance is assessed through company performance. Furthermore, according to studies by Chithambo & Tauringana, (2017) and Lagasio & Cucari, (2019) managerial ownership has a negative effect on the disclosure of carbon emissions; that is, the more shares that management owns, the less carbon emissions are disclosed. This is a result of the board of directors being under greater pressure than shareholders so that management views shareholders as having little influence in implementing company policies, including in this case regarding carbon emissions disclosure policies.

5.2. The Effect of Institutional Ownership on Carbon Emission Disclosure

Institutional ownership is a variable that can positively influence the disclosure of carbon emissions (Wegener et al., 2013; Liesen et al., 2015; Amaliyah & Solikhah, 2019; Solikhah et al., 2021; Döring et al., 2023). As explained by Widyaningsih et al., (2017) ownership by institutions can reduce and even prevent the attitude of managers who want to take advantage of opportunities in their positions to benefit themselves. Companies with

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greater institutional ownership can encourage better supervision, especially in environmental disclosure activities that can increase company value and improve the company's reputation for stakeholders. Institutional ownership is a variable that can positively influence the carbon emissions disclosure.

This study has different results with the formulation of hypothesis H2. This study's results align with research (Ezhilarasi & Kabra, 2017; Halimah & Yanto, 2018; Hermawan et al., 2018; Darlis et al., 2020). Based on the research results of Hermawan et al. (2018), it is explained that institutional ownership does not affect the carbon emissions disclosure because the decision to make voluntary disclosures related to carbon emissions is a management policy. Hence, disclosure or not depends on the policies made by the management of each company. Therefore, high and low institutional ownership does not affect the amount of carbon information that needs to be disclosed. This allows companies with low institutional ownership to disclose carbon information if necessary. In addition, institutional shareholders are generally passive towards the disclosure made by the company (Ezhilarasi & Kabra, 2017).

5.3. The Effect of Enviromental Committee on Carbon Emission Disclosure

The existence of environmental committee variables has a relationship and can positively influence the disclosure of carbon emissions footprint (Peters & Romi, 2014). Based on Liao et al., (2015), carbon emission disclosure is also based on the company's ability to achieve yearly carbon reduction targets. The board of directors cannot directly control such technical matters, so it is necessary to form an environmental committee to make it easier for the board of directors to supervise the stages of carbon emission disclosure. In addition, the existence of an environmental committee is a factor that determines whether or not and how much carbon emission disclosure is made by the company. The existence of this committee encourages companies to monitor and report their carbon emissions to show all stakeholders that they are trying to avoid business risks that may occur due to global warming (Kılıç & Kuzey, 2019). In addition, a special committee reflects the company's good attitude towards social activities. Usually, companies with high social awareness will increase their social disclosure, including, in this case, disclosing more carbon emissions (Fahad & Rahman, 2020).

This study has the same results as the formulation of hypothesis H3 and is in line with research (Peters & Romi, 2014; Liao et al., 2015; Hollindale et al., 2019; Kılıç & Kuzey, 2019; Fahad & Rahman, 2020). They found that the existence of a special committee formed to be

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responsible for environmental disclosure plays a significant role in the disclosure of carbon emissions and positively influences the company's decision to disclose and expand the scope of disclosure. The results of this study support the legitimacy theory. In order to gain recognition of existence by society, the company shows its attitude towards the issue of global warming so that the company will be recognized as an entity that cares about the surrounding environment. Efforts to obtain this legitimacy are carried out by forming an environmental committee that focuses on sustainability issues and ensures that the company is involved in its responsibilities regarding the environment and conveys this through sustainability reports (Yunus et al., 2016).

5.4. The Effect of Board Size on Carbon Emission Disclosure

Board size positively influences carbon emissions disclosure (Liao et al., 2015; Yunus et al., 2016; Nasih et al., 2019; Riantono & Sunarto, 2022). Based on Yunus et al., (2016) increasing the number of directors in the company can increase the breadth of supervision. The larger the board of directors, the better corporate governance will be so that companies will be more active in responding to issues related to carbon emissions, including making disclosures. This result supports research (Akbaş & Canikli, 2019; Haque, 2017; Kılıç & Kuzey, 2019). This study has different results with the formulation of hypothesis H4. However, the results of Haque, (2017); and Kılıç & Kuzey, (2019) found that board size does not significantly influence carbon emissions disclosure. This suggests that a larger board size may not encourage companies to engage in sustainability actions, one of which is to disclose carbon emissions to show the company's carbon emission reduction results. In addition, Akbaş & Canikli, (2019) found that board size negatively influences carbon emissions disclosure. Consequently, a higher quantity of boards of directors leads to a decreased level of carbon emissions disclosure. Smaller board sizes in companies are positively associated with a higher possibility of disclosing carbon emissions. This is because a larger board size may increase supervision, but the large size of the board of directors may cause communication problems to arise due to the diverse opinions and expertise backgrounds within the board of directors when making decisions.

5.5. The Effect of Independent Commisioner on Carbon Emission Disclosure

The independent commissioners is one of the variables that can have a positive influence on the company's decision to report carbon emissions disclosure (Kılıç & Kuzey, 2019; Trufvisa & Ardiyanto, 2019; Solikhah et al., 2021). In Jizi et al., (2014) the

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independence of independent commissioners is believed to provide information disclosure for stakeholders because it is their right. As Trufvisa & Ardiyanto, (2019), independent commissioners can ensure that business activities are under social values and can provide greater accountability. This happens because the more independent commissioners, the more commissioners who are not connected to the board of directors and other commissioners so that decisions can be made more objectively. However, the results of this study do not support H5. Based on the research of Novitasari & Bernawati, (2020), the proportion of independent commissioners on board of commissioners as one of the characteristics of good corporate governance does not affect CSR disclosure. In addition, Ifada et al., (2021) found that the independence of commissioners does not determine the extent of environmental disclosure due to inefficient supervision by independent commissioners. Longer time will be needed for decision-making if the proportion of independent commissioners is greater. It is even asserted that corporate governance does not influence corporate social responsibility disclosure and environmental disclosure due to the dominant role of executive directors in the company. Hence, the quantity of the board of commissioners' proportion has no effect on the effectiveness of supervision pertaining to environmental disclosure, including the disclosure of carbon emissions (Diamastuti et al., 2021).

5.6. The Effect of Gender Diversity on Carbon Emission Disclosure

The presence of gender diversity within the board of directors has the potential to yield favorable outcomes in terms of enhancing the transparency and reporting of carbon emissions (Ben-Amar et al., 2017; Nuber & Velte, 2021; Tingbani et al., 2020; Gonenc & Krasnikova, 2022; Kim, 2022). As Tingbani et al., (2020) said, the higher the proportion of female board of directors, the higher the frequency of disclosure of information related to carbon emissions because women are considered more sensitive to social issues than men so that they can handle environmental problems better. However, the results of this study do not support the formulation of H6. However, it supports the results of the research (Kılıç & Kuzey, 2019; Widia Astuti & Setiany, 2021; Febrianto et al., 2022). They found no effect between gender diversity and carbon emissions disclosure. This is because gender diversity is still low in research objects, especially in research objects in Indonesia. Based on research data, there are only 38% of data on gender diversity, so it is assumed that statistically, gender diversity cannot have a significant effect or does not effect the disclosure of carbon emissions.

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5.7. The Effect of CEO Duality on Carbon Emission Disclosure

The presence of a single individual serving as both CEO and board chairperson can exert a positive impact on the transparency and reporting of carbon emissions. The results of this study support the formulation of hypothesis H7 and the research results (Arena et al., 2015; Fahad & Rahman, 2020; Elsayih et al., 2021). Based on Elsayih et al., (2021) CEOs or directors who hold concurrent positions can be more involved in activities that can increase the disclosure of carbon emissions. Furthermore, this outcome might be attributed to the research data showing 88% of companies have CEO duality, so this result supports the basic explanation in stewardship theory where the board of directors does not have a personal interest and will prioritize the company's interests. With this dual position, directors can make decisions faster because they have two or more positions at once. When viewed from the point of view of stakeholder theory, with the time needed to make decisions faster, stakeholders can implement these decisions quickly as well.

5.8. Role of Moderating Variable

According to the findings of this study, the effect of good corporate governance characteristics (managerial ownership, institutional ownership, environmental committee, board size, independent commissioners, gender diversity, and CEO duality) on carbon emissions disclosure cannot be moderated by company size. According to the regression analysis results, the company size variable is not a moderator. It is, however, a predictor or independent variable. Several research employing firm size as an independent variable back up the findings of this study. Company size has a significant and positif impact on the disclosure of carbon emissions footprint (Akbaş & Canikli, 2019; Hermawan et al., 2018; Nasih et al., 2019).

6. CONCLUSİON

The purpose of this study is to analyze the effect of good corporate governance characteristic on the carbon emissions disclosure. The research data was taken from IDX or each company's website with a total sample of 26 companies from four sectors: energy, industrial, material, and transportation. The observation period is from 2018-2022. The variables used in this study contain several elements of corporate governance, including management ownership, institutional ownership, the presence of environmental committees, board size, the proportion of independent commissioners on board of

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commisioners, gender diversity, and CEO duality. Based on the study's results, the environmental committee and CEO duality significantly affect carbon emission disclosure. Simultaneously, factors like as management ownership, institutional ownership, board size, and independent commissioners have no effect on the disclosure of carbon emissions.

This study contributes to companies being able to pay more attention to factors that can positively affect carbon emissions disclosure so that disclosure can be more extensive. In addition, companies are expected to continue to improve and even expand their carbon emission disclosures. The implication of this research for investors is to pay attention to factors that affect carbon emission disclosure, such as an environmental committee and CEO duality in the company, before investing, especially for investors who care about environmental or sustainability issues. With this, companies can consider companies that disclose carbon emissions more. This is done as an effort by investors to reduce their carbon footprint through their investment.

The study is limited in that it only examines companies classified as carbon-intensive industries and only considers some aspects of strong corporate governance when assessing its impact on carbon emission disclosure. There are still many characteristics of good corporate governance that still need to be considered in this study. Therefore, suggestions for future research are to consider other good corporate governance characteristics and sectors other than those included in carbon-intensive industries such as the financial sector, property and real estate, infrastructure, health, and technology. In addition, the research period can be considered narrower because only a few companies have made sustainability reports from 2018 to 2019. Judging from the population of companies starting to report many sustainability reports in 2020. So that the number of samples from each sector can be greater because in this study, the transportation sector is only represented by one company.

REFERENCES

Akbaş, H. E., & Canikli, S. (2019). Determinants of voluntary greenhouse gas emission disclosure: An empirical investigation on Turkish firms. Sustainability (Switzerland), 11(1). https://doi.org/10.3390/su11010107

Akhiroh, T., & Kiswanto. (2016). The Determinant Of Carbon Emission Disclosures. Accounting Analysis Journal , 5(4). http://journal.unnes.ac.id/sju/index.php/aaj

Amaliyah, I., & Solikhah, B. (2019). Pengaruh Kinerja Lingkungan dan Karakteristik Corporate Governance Terhadap Pengungkapan Emisi Karbon. Journal of Economic,

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Management, Accounting and Technology, 2(2). https://doi.org/10.32500/jematech.v2i2.720

Andrian, T., & Kevin. (2021). Determinant Factors of Carbon Emission Disclosure in Indonesia. Journal of Southwest Jiaotong University, 56(1). https://doi.org/10.35741/issn.0258-2724.56.1.32

Andrian, T., & Sudibyo, Y. A. (2019). Disclosure Effect of Carbon Emission and Corporate Social Responsibility to Financial Performance. Journal of Economics and Sustainable Development, 10(12). https://doi.org/10.7176/JESD

Ardian Perdana, V., & Anshori, M. (2022). Determinant factors affecting environmental, social and governance (ESG) disclosure. Keberlanjutan : Jurnal Manajemen Dan Jurnal Akuntansi , 7(1), 25–36. https://doi.org/10.32493/keberlanjutan.v7i1.y2022.p25-36

Arena, C., Bozzolan, S., & Michelon, G. (2015). Environmental Reporting: Transparency to Stakeholders or Stakeholder Manipulation? An Analysis of Disclosure Tone and the Role of the Board of Directors. Corporate Social Responsibility and Environmental Management, 22(6), 346–361. https://doi.org/10.1002/csr.1350

Astari, A., Saraswati, E., & Purwanti, L. (2020). The Role of Corporate Governance as a Moderating Variable on Earnings Management and Carbon Emission Disclosure. Jurnal Dinamika Akuntansi Dan Bisnis, 7(1), 69–86. https://doi.org/10.24815/jdab.v7i1.15402

Asyari, S., & Dianwicaksih Arieftiara. (2022). Investors React to Disclosure of Carbon Emissions and Environmental Performance. International Journal of Contemporary Accounting, 4(1), 59–76. https://doi.org/10.25105/ijca.v4i1.13911

Bae Choi, B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. Pacific Accounting Review, 25(1), 58–79. https://doi.org/10.1108/01140581311318968

Baltagi, B. H. (2005). Econometric Analysis of Panel Data Third Edition (Third Edition). John Wiley & Sons Ltd.

Ben-Amar, W., Chang, M., & McIlkenny, P. (2017). Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project. Journal of Business Ethics, 142(2), 369–383. https://doi.org/10.1007/s10551-015-2759-1

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Blesia, J. U., Trapen, E., & Arunglamba, R. S. (2023). The Moderate Effect of Good Corporate Governance on Carbon Emission Disclosure and Company Value. The Indonesian Journal of Accounting Research, 26(01). https://doi.org/10.33312/ijar.663

Budiharta, P., & Kacaribu, H. E. P. B. (2022). The Influence of Board of Directors, Managerial Ownership, and Audit Committee on Carbon Emission Disclosure: A Study of Non-Financial Companies Listed on BEI. Journal of Contemporary Accounting, 4(1). https://doi.org/https://doi.org/10.20885/jca.vol4.iss1.art1

Chithambo, L., & Tauringana, V. (2017). Corporate governance and greenhouse gas disclosure: a mixed-methods approach. Corporate Governance (Bingley), 17(4), 678–699. https://doi.org/10.1108/CG-10-2016-0202

Cornell, B., & Shapiro, A. C. (1987). Corporate Stakeholders and Corporate Finance. Financial Management, 16(1), 5–14. https://www.jstor.org/stable/3665543

Crippa, M., Guizzardi, D., Banja, M., Solazzo, E., Muntean, M., Schaaf, E., Pagani F., Monforti-Ferrario, F., Olivier, J. G. J., Quadrelli, R., Risquez Martin, A., Taghavi-Moharamli, P., Grassi, G., Rossi, S., Oom, D., Branco, A., San-Miguel, J., Vignati, E., & European Commission. Joint Research Centre. (2022). CO2 emissions of all world countries : JRC/IEA/PBL 2022 Report. EU Publications. https://doi.org/10.2760/07904

Damas, D., Maghviroh, R. EL, & Meidiyah, M. (2021). Pengaruh Eco-Efficiency, Green Inovation dan Carbon Emission Disclosure terhadap Nilai Perusahaan dengan Kinerja Lingkungan sebagai Moderasi. Jurnal Magister Akuntansi Trisakti, 8(2), 85–108. https://doi.org/10.25105/jmat.v8i2.9742

Darlis, E., Kurnia, P., & Alamsyah, M. (2020). Carbon Emission Disclosure: A Study on Manufacturing Companies of Indonesia and Australia. IOP Conference Series: Earth and Environmental Science, 469(1). https://doi.org/10.1088/1755-1315/469/1/012014

Davis, J. H., David Schoorman, F., & Donaldson, L. (1997). Toward a Stewardship Theory of Management. The Academy of Management Review, 22(1), 20–47. https://doi.org/https://doi.org/10.2307/259223

Deswanto, R. B., & Siregar, S. V. (2018). The associations between environmental disclosures with financial performance, environmental performance, and firm value. Social Responsibility Journal, 14(1), 180–193. https://doi.org/10.1108/SRJ-01-2017-0005

Diamastuti, E., Muafi, M., Fitri, A., & Faizaty, N. E. (2021). The Role of Corporate Governance in the Corporate Social and Environmental Responsibility Disclosure. Journal of Asian

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Finance, Economics and Business, 8(1), 187–198. https://doi.org/10.13106/jafeb.2021.vol8.no1.187

Döring, S., Drobetz, W., Ghoul, S. El, Guedhami, O., & Schröder, H. (2023). Foreign Institutional Investors, Legal Origin, and Corporate Greenhouse Gas Emissions Disclosure. Journal of Business Ethics, 182, 903–932.

Dowling, J., & Pfeffer, J. (1975). Organizational Legitimacy: Social Values and Organizational Behavior. The Pacific Sociological Review, 18(1), 122–136. https://www.jstor.org/stable/1388226?origin=JSTOR-pdf

Eka Chandra Pramuditya, I. D. G. N., & Budiasih, I. G. A. N. (2020). Dampak Mekanisme Good Corporate Governance pada Carbon Emission Disclosure. E-Jurnal Akuntansi, 30(12), 3052. https://doi.org/10.24843/eja.2020.v30.i12.p05

Elsayih, J., Datt, R., & Hamid, A. (2021). CEO characteristics: do they matter for carbon performance? An empirical investigation of Australian firms. Social Responsibility Journal, 17(8), 1279–1298. https://doi.org/10.1108/SRJ-04-2020-0130

Elsayih, J., Tang, Q., & Lan, Y. C. (2018). Corporate governance and carbon transparency: Australian experience. Accounting Research Journal, 31(3), 405–422. https://doi.org/10.1108/ARJ-12-2015-0153

Ezhilarasi, G., & Kabra, K. C. (2017). The impact of corporate governance attributes on environmental disclosures: Evidence from India. Indian Journal of Corporate Governance, 10(1), 24–43. https://doi.org/10.1177/0974686217701464

Fahad, P., & Rahman, P. M. (2020). Impact of corporate governance on CSR disclosure. International Journal of Disclosure and Governance, 17(2–3), 155–167. https://doi.org/10.1057/s41310-020-00082-1

Faisal, F., Andiningtyas, E. D., Achmad, T., Haryanto, H., & Meiranto, W. (2018). The content and determinants of greenhouse gas emission disclosure: Evidence from Indonesian companies. Corporate Social Responsibility and Environmental Management, 25(6), 1397–1406. https://doi.org/10.1002/csr.1660

Febrianto, R., Verginia, M., & Fontanella, A. (2022). Pengaruh Gender Diversity Dan Board Independence Terhadap Emisi Karbon Dengan Media Exposure Sebagai Moderasi. Jurnal Akuntansi Dan Ekonomika, 12(2), 238–246. https://doi.org/10.37859/jae.v12i2.4209

Firmansyah, A., Jadi, P. H., Febrian, W., & Fasita, E. (2021). Respon Pasar atas Pengungkapan Emisi Karbon di Indonesia : Bagaimana Peran Tata Kelola Perusahaan? Jurnal

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Magister Akuntansi Trisakti, 8(2), 151–170. https://doi.org/10.25105/jmat.v8i2.9789

Friedlingstein, P., O'sullivan, M., Jones, M. W., Andrew, R. M., Gregor, L., Hauck, J., Le Quéré, C., Luijkx, I. T., Olsen, A., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Alkama, R., … Zheng, B. (2022). Global Carbon Budget 2022. Earth System Science Data, 14(11), 4811–4900. https://doi.org/10.5194/essd-14-4811-2022

Giannarakis, G., Konteos, G., Sariannidis, N., & Chaitidis, G. (2017). The relation between voluntary carbon disclosure and environmental performance: The case of S&P 500. International Journal of Law and Management, 59(6), 784–803. https://doi.org/10.1108/IJLMA-05-2016-0049

Gonenc, H., & Krasnikova, A. V. (2022). Board Gender Diversity and Voluntary Carbon Emission Disclosure. Sustainability (Switzerland), 14(21). https://doi.org/10.3390/su142114418

Gujarati, D. C., & Porter, D. C. (2009). Dasar-Dasar Ekonometrika (Terjemahan). Salemba Empat.

Halimah, N. P., & Yanto, H. (2018). Determinant of Carbon Emission Disclosure at Mining Companies Listed in Indonesia Stock Exchange. KnE Social Sciences, 3(10), 127. https://doi.org/10.18502/kss.v3i10.3124

Hapsoro, D., & Falih, Z. N. (2020). The Effect of Firm Size, Profitability, and Liquidity on The Firm Value Moderated by Carbon Emission Disclosure. Journal of Accounting and Investment, 21(2). https://doi.org/10.18196/jai.2102147

Haque, F. (2017). The effects of board characteristics and sustainable compensation policy on carbon performance of UK firms. British Accounting Review, 49(3), 347–364. https://doi.org/10.1016/j.bar.2017.01.001

Hardiyansah, M., Agustini, A. T., & Purnamawati, I. (2021). The Effect of Carbon Emission Disclosure on Firm Value: Environmental Performance and Industrial Type. Journal of Asian Finance, Economics and Business, 8(1), 123–133. https://doi.org/10.13106/jafeb.2021.vol8.no1.123

Hatane, S. E., Supangat, S., Tarigan, J., & Jie, F. (2019). Does internal corporate governance mechanism control firm risk? Evidence from Indonesia's three high-risk sectors. Corporate Governance (Bingley), 19(6), 1362–1376. https://doi.org/10.1108/CG-02-2019-0071

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

He, P., Shen, H., Zhang, Y., & Ren, J. (2019). External pressure, corporate governance, and voluntary carbon disclosure: Evidence from China. Sustainability (Switzerland), 11(10). https://doi.org/10.3390/su11102901

Hermawan, A., Aisyah, I. S., Gunardi, A., & Putri, W. Y. (2018). Going Green: Determinants of Carbon Emission Disclosure in Manufacturing Companies in Indonesia. International Journal of Energy Economics and Policy |, 8(1), 55–61. http:www.econjournals.com

Hollindale, J., Kent, P., Routledge, J., & Chapple, L. (2019). Women on boards and greenhouse gas emission disclosures. Accounting and Finance, 59(1), 277–308. https://doi.org/10.1111/acfi.12258

Hossain, M., Al Farooque, O., Momin, M. A., & Almotairy, O. (2017). Women in the boardroom and their impact on climate change related disclosure. Social Responsibility Journal, 13(4), 828–855. https://doi.org/10.1108/SRJ-11-2016-0208

Ifada, L. M., Indriastuti, M., Ibrani, E. Y., & Setiawanta, Y. (2021). Environmental Performance and Environmental Disclosure: The Role of Financial Performance. Journal of Asian Finance, Economics and Business, 8(4), 349–362. https://doi.org/10.13106/jafeb.2021.vol8.no4.0349

Iwasaki, I. (2009). The Structure of Corporate Boards. In T. Dolgopyatova, I. Iwasaki, & A. A. Yakovlev (Eds.), Organization and Development of Russian Business (pp. 89–121). Palgrave Macmillan. https://doi.org/https://doi.org/10.1057/9780230249493_5

Jannah, B. S., Rakhmatullah, H. W., & Bakhtiar, Y. (2021). Sustainability reports disclosures: Siapakah stakeholder yang paling penting? Jurnal Manajemen Dan Jurnal Akuntansi, 6(1), 53–62. https://doi.org/10.32493/keberlanjutan.v6i1.y2021.p53-62

Jizi, M. I., Salama, A., Dixon, R., & Stratling, R. (2014). Corporate Governance and Corporate Social Responsibility Disclosure: Evidence from the US Banking Sector. Journal of Business Ethics, 125(4), 601–615. https://doi.org/10.1007/s10551-013-1929-2

Kihiko, M. K., & Kinoti, M. W. (2016). The business case for climate change: The impact of climate change on Kenya's public listed companies. Advances in Sustainability and Environmental Justice, 19, 133–157. https://doi.org/10.1108/S2051-503020160000019007

Kılıç, M., & Kuzey, C. (2019). The effect of corporate governance on carbon emission disclosures: Evidence from Turkey. International Journal of Climate Change Strategies and Management, 11(1), 35–53. https://doi.org/10.1108/IJCCSM-07-2017-0144

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Kim, E. (2022). The Effect of Female Personnel on the Voluntary Disclosure of Carbon Emissions Information. International Journal of Environmental Research and Public Health, 19(20). https://doi.org/10.3390/ijerph192013247

Kurnia, P., Darlis, E., & Putra, A. A. (2020). Carbon Emission Disclosure, Good Corporate Governance, Financial Performance, and Firm Value. Journal of Asian Finance, Economics and Business, 7(12), 223–231. https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.223

Lagasio, V., & Cucari, N. (2019). Corporate governance and environmental social governance disclosure: A meta-analytical review. Corporate Social Responsibility and Environmental Management, 26(4), 701–711. https://doi.org/10.1002/csr.1716

Liao, L., Luo, L., & Tang, Q. (2015). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. British Accounting Review, 47(4), 409–424. https://doi.org/10.1016/j.bar.2014.01.002

Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe. Accounting, Auditing and Accountability Journal, 28(7), 1047–1074. https://doi.org/10.1108/AAAJ-12-2013-1547

Mahrani, M., & Soewarno, N. (2018). The effect of good corporate governance mechanism and corporate social responsibility on financial performance with earnings management as mediating variable. Asian Journal of Accounting Research, 3(1), 41–60. https://doi.org/10.1108/AJAR-06-2018-0008

Mardiana, W., & Irawati, A. (2019). Factors Influence Corporate Social Responsibility Disclosure. Esensi: Jurnal Bisnis Dan Manajemen, 9(2), 185–190. https://doi.org/10.15408/ess.v9i2.13582

Mujiani, S., Fauziah, F., & Artikel, K. (2019). Determinan Carbon Emission Disclosure Pada Perusahaan Bumn yang Terdaftar di Bursa Efek Indonesia Periode 2013-2017. Jurnal Ilmiah Akuntansi Fakultas Ekonomi), 5(1), 53–64. https://doi.org/https://doi.org/10.34204/jiafe.v5i1.1542

Murhadi, W. R. (2009). Studi Pengaruh Good Corporate Governance Terhadap Praktik Earnings Management pada Perusahaan Terdaftar di PT Bursa Efek Indonesia. Jurnal Manajemen Dan Kewirausahaan, 11(1). https://doi.org/https://doi.org/10.9744/jmk.11.1.pp.%201-10

Nasih, M., Harymawan, I., Paramitasari, Y. I., & Handayani, A. (2019). Carbon emissions, firm size, and corporate governance structure: Evidence from the mining and agricultural

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industries in Indonesia. Sustainability (Switzerland), 11(9). https://doi.org/10.3390/su11092483

Nishitani, K., Jannah, N., Kaneko, S., & Hardinsyah. (2017). Does corporate environmental performance enhance financial performance? An empirical study of indonesian firms. Environmental Development, 23, 10–21. https://doi.org/10.1016/j.envdev.2017.06.003

Noor, A., & Ginting, Y. L. (2022). Influence of Carbon Emission Disclosure on Firm Value of Industrial Firms in Indonesia. International Journal of Contemporary Accounting, 4(2), 151–168. https://doi.org/10.25105/ijca.v4i2.15247

Novitasari, D., & Bernawati, Y. (2020). The Impact of Good Corporate Governance on the Disclosure of Corporate Social Responsibility. International Journal of Innovation, Creativity and Change, 10(12), 265–276. https://www.ijicc.net/images/vol10iss12/101220_Novitasari_2020_E_R.pdf

Nuber, C., & Velte, P. (2021). Board gender diversity and carbon emissions: European evidence on curvilinear relationships and critical mass. Business Strategy and the Environment, 30(4), 1958–1992. https://doi.org/10.1002/bse.2727

Oware, K. M. (2022). Effect of CEO Duality and Board Characteristics on the Choice of Sustainability Report Format of Listed Firms in India. Indonesian Journal of Sustainability Accounting and Management, 6(2). https://doi.org/10.28992/ijsam.v6i2.666

Ozili, P. K. (2020). Effect of Climate Change on Financial Institutions and the Financial System. In Uncertainty and Challenges in Contemporary Economic Behaviour (pp. 139–144). Emerald Group Publishing Ltd. https://doi.org/10.1108/978-1-80043-095-220201011

Peters, G. F., & Romi, A. M. (2014). Does the Voluntary Adoption of Corporate Governance Mechanisms Improve Environmental Risk Disclosures? Evidence from Greenhouse Gas Emission Accounting. Journal of Business Ethics, 125(4), 637–666. https://doi.org/10.1007/s10551-013-1886-9

Rachmawati, S. (2021). Green Strategy Moderate The Effect of Carbon Emission Disclosure and Environmental Performance on Firm Value. International Journal of Contemporary Accounting, 3(2), 133–152. https://doi.org/10.25105/ijca.v3i2.12439

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Riantono, I. E., & Sunarto, F. W. (2022). Factor Affecting Intentions of Indonesian Companies to Disclose Carbon Emission. International Journal of Energy Economics and Policy, 12(3), 451–459. https://doi.org/10.32479/ijeep.12954

Rokhmawati, A., Sathye, M., & Sathye, S. (2015). The Effect of GHG Emission, Environmental Performance, and Social Performance on Financial Performance of Listed Manufacturing Firms in Indonesia. Procedia - Social and Behavioral Sciences, 211, 461–470. https://doi.org/10.1016/j.sbspro.2015.11.061

Rossi, M., Rokhmawati, A., & Gunardi, A. (2017). How Powerful is Your Customers' Reaction to Carbon Performance? Linking Carbon and Firm Financial Performance. International Journal of Energy Economics and Policy |, 7(6), 85–95. http:www.econjournals.com

Saraswati, E., Puspita, N. R., & Sagitaputri, A. (2021). Do firm and board characteristics affect carbon emission disclosures? International Journal of Energy Economics and Policy, 11(3), 14–19. https://doi.org/10.32479/ijeep.10792

Shan, Y. G., Tang, Q., & Zhang, J. (2021). The impact of managerial ownership on carbon transparency: Australian evidence. Journal of Cleaner Production, 317. https://doi.org/10.1016/j.jclepro.2021.128480

Shrivastav, S. M. (2016). The Relationship Between CEO Duality and Firm Performance: An Analysis Using Panel Data Approach. The IUP Journal of Corporate Governance, XV(2), 37–58. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2853984

Solikhah, B., Wahyuningrum, I. F. S., Yulianto, A., Sarwono, E., & Widiatami, A. K. (2021). Carbon emission report: A review based on environmental performance, company age and corporate governance. IOP Conference Series: Earth and Environmental Science, 623(1). https://doi.org/10.1088/1755-1315/623/1/012042

Tingbani, I., Chithambo, L., Tauringana, V., & Papanikolaou, N. (2020). Board gender diversity, environmental committee and greenhouse gas voluntary disclosures. Business Strategy and the Environment, 29(6), 2194–2210. https://doi.org/10.1002/bse.2495

Trufvisa, U. S., & Ardiyanto, M. D. (2019). Pengaruh Karakteristik Dewan Komisaris Terhadap Pengungkapan Emisi Karbon. Diponegoro Journal Of Accounting, 8(1). http://ejournal-s1.undip.ac.id/index.php/accounting

Ummah, Y. R., & Setiawan, D. (2021). Do Board of Commissioners Characteristic and International Environmental Certification Affect Carbon Disclosure? Evidence from

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Indonesia. Jurnal Dinamika Akuntansi Dan Bisnis, 8(2), 215–228. https://doi.org/10.24815/jdab.v8i2.21332

Wegener, M., Elayan, F. A., Felton, S., & Li, J. (2013). Factors Influencing Corporate Environmental Disclosures. Accounting Perspectives, 12(1), 53–73. https://doi.org/10.1111/1911-3838.12007

Wenni Anggita, Ari Agung Nugroho, & Suhaidar. (2022). Carbon Emission Disclosure And Green Accounting Practices On The Firm Value. Jurnal Akuntansi, 26(3), 464–481. https://doi.org/10.24912/ja.v26i3.1052

Widia Astuti, T., & Setiany, E. (2021). The Effect of Board Characteristics on Carbon Emission Disclosure. International Journal of Management Studies and Social Science Research, 207. www.ijmsssr.org

Widyaningsih, I. U., Gunardi, A., Rossi, M., & Rahmawati, R. (2017). Expropriation by the controlling shareholders on firm value in the context of Indonesia: corporate governance as moderating variable. International Journal Managerial and Financial Accounting, 9(4), 322–337. 322278260_Expropriation_by_the_controlling_shareholders_on_firm_value_in_the_context_of_Indonesia_corporate_governance_as_moderating_variable

Yunus, S., Elijido-Ten, E., & Abhayawansa, S. (2016). Determinants of carbon management strategy adoption: Evidence from Australia's top 200 publicly listed firms. Managerial Auditing Journal, 31(2), 156–179. https://doi.org/10.1108/MAJ-09-2014-1087

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