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Carbon Emissions Disclosure are Reviewed of Firm Characteristics, Environmental Performance and Women on the Board of Directors

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Abstract

Purpose: This study aims to test and analyze the effect of company size, company age, environmental performance and women on the board of directors on the disclosure of carbon emissions in energy sector companies listed on the Indonesia Stock Exchange for the 2019-2021 period.

Method: The data analysis method used, namely multiple linear regression analysis. The sampling technique in this study used purposive sampling technique and obtained a sample of 60 companies, so that the number of observations was 180 observations.

Findings: The results of this study indicate that company size and environmental performance affect the disclosure of carbon emissions. While the age of the company and women in the board of directors have no effect on the disclosure of carbon emissions.

Originality/Value: The results of this research will most likely help companies develop their understanding of environmental issues, especially in disclosing carbon emissions These findings can assist companies in developing carbon emission management strategies by considering factors such as company size and environmental performance. In addition, the results of this study may increase corporate awareness of the importance of corporate sustainability in business practices.

Keywords: Carbon Emissions Disclosure, Company Characteristics, Environmental Performance

Paper Type: Research Paper

1. Introduction

Climate change is perhaps the most persistent threat to global stability, with a growing body of research showing that "global warming" or the "greenhouse effect" poses a serious threat to the quality of human life (Giannarakis et al., 2017; Luo & Tang, 2014). Companies that have a large contribution to climate change should have an awareness of the problems that arise caused by the company's operations. Companies have a commitment to be accountable for the environmental impacts that arise with the disclosure of carbon emissions both in terms of social, economic and environmental. Based on the International Energy Agency (IEA) report, one of the carbon emissions, namely carbon dioxide (CO2) emissions, will reach a record high in 2022. The increase in greenhouse gas emissions goes hand in hand with an increase in energy production, which grew 9% or reached 36.8 gigatons. International and national fossil fuel companies generate high revenues. However, emissions from fossil fuels are hampering efforts to meet global climate targets. Carbon dioxide emissions result from fossil fuels used to power cars, planes and

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factories. This increase in CO2 emissions is also due to many communities in Asia switching from natural gas to coal and increased global aviation (Arif, 2023).

In 2004, Indonesia issued Law number 17 of 2004 concerning the ratification of the Kyoto Protocol to the United Framework Convention on Climate Change. The subject of the Kyoto Protocol is to require all members of Anex 1 to reduce the effects of greenhouse gases (GHG). GHG emissions according to Annex A of the Kyoto Protocol include carbon dioxide (CO2), Methane (CH4), Nitrous Oxide (N20), Hydrofluorocarbons (NFC), Perfluorocarbons (PFCs) and Sulfurhexafluoride (SF6). With the existence of the Law, Indonesia is committed to jointly protect and protect human life and ecosystems on earth from climate change and global warming. The implication of the Kyoto Protocol is the emergence of carbon accounting, where companies are required to recognize, measure, record, present and disclose carbon emissions (Irwhantoko & Basuki, 2016).

According to the Greek Climate Change Report and the MPV Report on Climate Change Management 2021 published by the Ministry of Environment and Forests in 2020, energy sector companies were the first to contribute to an increase in greenhouse gas emissions at the national level by 56%. Energy companies are the largest contributor to the increase in carbon emissions. Based on analysis using the GRI Standard, it states that energy companies have a fairly good performance towards reducing carbon emissions and making efforts to reduce GHG emissions. However, case analysis of energy companies PT AKR Corporindo Tbk, PT Bumi Resoures Tbk, PT Indo Tambangraya Megah Tbk, PT Perusahaan Gas Negara and PT Bukit Asam Tbk states that the average disclosure of carbon emissions tends to be low and has a downward trend. PT Indo Tambangraya is the company that discloses the highest carbon emissions in a row for 3 years, namely 2018 and 2019 at 53.40% and 2020 at 40.66% compared to other companies. Although the average disclosure made by PT Indo Tambangraya experienced a downward trend for three consecutive years. This means that PT AKR Corporindo Tbk, PT Bumi Resoures Tbk, PT Perusahaan Gas Negara and PT Bukit Asam Tbk disclose carbon emissions on average below 50% and have a decreasing disclosure trend (Fernanda, 2022).

Disclosure of carbon emissions is one of the environmental issues gan that is developing in various countries including in Indonesia. Disclosure of carbon emissions is one of the environmental disclosures that need to be made by companies (Solikhah et al., 2018). The disclosure of carbon emissions incorporates carbon emission concentrated, energy utilization, corporate administration, climate change methodology, carbon emission decrease execution and climate alter dangers and opportunities (Kelvin et al., 2017). However, many companies in Indonesia still do not disclose carbon emissions because such information is costly and can reduce company profits.

Disclosure of carbon emissions in Indonesia is still voluntary and not all companies disclose this information in their annual reports. Companies are starting to disclose carbon emissions to stakeholders with the aim of increasing transparency and accountability (Hariswan et al., 2022). The disclosure is one way for companies to communicate and demonstrate responsibility to stakeholders. One of the stakeholders is the community, so thorough disclosure can improve the company's image in the community and show that the company cares about the issue of carbon emissions from mining operations. Conversely, a company's failure to provide comprehensive disclosure indicates its indifference to the demands for information disclosure from its various stakeholders (Anshari & Isnalita, 2020). This is one of the motivations for conducting research on carbon emission disclosure because carbon emission disclosure is needed to reduce carbon emissions generated by the company. Previous studies that have examined the factors that influence the disclosure of

carbon emissions are company size, company age, environmental performance and women on the board of directors. However, the results of previous studies are still inconsistent so there is still a research gap in that focus.

Research conducted by Choi et al. (2013) found that larger companies will disclose carbon emissions more comprehensively than smaller companies. The size of the company is reflected in all the assets owned by the company. If the number of assets increases, the size of the company will also increase and the invested capital will increase. And if sales increase, the circulation of money in the company will also (Hariswan et al., 2022). Some research conducted Sekarini and Setiadi (2022), Hariswan et al. (2022), Choi et al. (2013), Luo et al. (2013), Ghomi and Leung (2013), and Selviana and Ratmono (2019) prove that company size affects the disclosure of carbon emissions. In contrast, research conducted by Septriyawati and Anisah (2019) and Wiratno and Muaziz (2020) show that there is no effect of company size on carbon emission disclosure.

The age of the business means how long the business has survived, developed or continued. The age of the company is calculated since the company was founded based on the deed of establishment. The longer the company stands, the more information the public will get (Asmeri et al., 2022). Research conducted by Asmeri et al. (2022) and Ghomi and Leung (2013) evidence suggests that a company's age can impact carbon emissions disclosure. Meanwhile, research conducted by Barusman et al. (2020) demonstrates that company age has no impact on revelation of carbon emanations.

Environmental performance is the company's commitment to improving the environment (Hilmi et al., 2020). Research conducted by Giannarakis et al. (2017) found that environmental performance has a positive impact using two approaches, namely by paying attention to environmental performance in terms of output, direct and indirect greenhouse gas emissions and companies have intentions in climate change mitigation, including climate change policies and climate change initiatives. The research conducted by Apriliana (2019) and Prasetya and Yulianto (2018) show that environmental performance affects the disclosure of carbon emissions. While some research conducted by Sekarini and Setiadi (2022) and Amaliyah and Solikhah (2019) state that environmental performance has no impact on the disclosure of carbon emissions.

Women directors have cognitive thinking that is different from men, gender diversity makes them tend to consider, discuss and integrate information in making decisions (Monica et al., 2021). Research conducted by Hollindale et al. (2019) found that companies with more female directors will make higher quality GHG emissions-related disclosures. This is proven by research conducted by Hariswan et al. (2022), Kim (2022), Ben-Amar and McIlkenny (2015) and Liao et al. (2015), expressed that ladies on the board of executives influence the revelation of carbon emissions. While some research conducted by Ararat and Sayedy (2019), Kılıç and Kuzey (2019), Sulistyowati and Tumirin (2023) state that women on the board of directors have no effect on carbon emission disclosure.

Based on this discussion, the motivation in conducting this research is to address the concerns of regulators and fill the literature gap and inconsistent research results. Because the disclosure of carbon emissions symbolizes the responsibility or response of the company to the climate (Damert et al., 2017). This study aims to test and analyze the effect of company size, company age, environmental performance and women on the board of directors on the disclosure of carbon emissions. The comes about of this consider are anticipated to include understanding into the advancement of science within the field of social and environmental bookkeeping, particularly within the revelation of carbon emanations in companies. In addition, this research is also expected to provide benefits to

parties such as companies, investors and the government in making decisions related to the disclosure of carbon emissions.

2. Literature Review

2.1 Agency Theory

This agency theory is based on the problems that arise in agency that arise between the management of a company, separate from its ownership (Hendrawaty, 2017). Agent theory can be defined as the relationship between investors who are also called principals and managers who can be called agents (Jensen & Meckling, 1976). The party called the owner of the company authorizes or delegates decision-making authority to another party (agent) and then the agent gives responsibility to the owner of the company for the decisions and actions he takes (Razak & Helmy, 2020). In agency theory, information asymmetry can occur because there is a contract between the owner and the agent. Because of the possibility of asymmetric information, the agent increases the firm's information disclosure to minimize information asymmetry between the firm and the firm and its stakeholders (Niza & Ratmono, 2019).

Grediani et al. (2020) states that the agent, in order to minimize the occurrence of asymmetric information with the principal, will try to disclose company information regarding greenhouse gas emissions, assisted by the board of directors as controller and supervisor of the agent's performance. In agency theory, information asymmetry can occur because there is a contract between the owner and the agent. Because there is a possibility of information asymmetry occurring, agents will increase disclosure of company information to reduce information asymmetry between the company and the company's stakeholders (Niza & Ratmono, 2019). Agency problems arise between management and shareholders, both majority and minority. This can happen because management as a party has more information about the company than the information held by the owner (principal). Therefore, companies are expected to make voluntary disclosures of information available to the company, for example related to environmental issues, in this case the disclosure of carbon emissions. This is expected to minimize asymmetric information between the agent and the principal.

2.2 Legitimacy Theory

Legitimacy theory states that companies or entities are part of society so they must pay attention to social values because conforming to social norms can make companies more legitimate (Titisari, 2020). Legitimacy theory according to Lincoln is a situation that occurs where the value system of a corporate entity is in compliant values of the the wider social system which is the place or reference of the entity. Legitimacy theory states that when viewed in terms of organizational systems, disclosure has an important role in connecting between corporate organizations, companies and associations of several groups of companies (Hilmi et al., 2020). This legitimacy theory discusses the social relationship between companies and society. Thus, companies have a responsibility to carry out company exercises in agreement with the standards that apply to society in order to maintain contracts with these communities. If the community feels harmed by the company due to the company's activities, the community revokes the legitimacy that has been given.

One of the theories that forms the basis for incentives for entities to voluntarily disclose social and environmental responsibility reports is legitimacy theory (Luo et al., 2013). Companies can voluntarily report company operational activities if company

management considers that this is what the company expects. The company will lose its license to run the company in the community by violating community norms and expectations (Titisari, 2020). Therefore, legitimacy is considered as a way to maintain the company's survival through organizational actions that are in accordance with the rules and can be accepted by the wider community (Titisari, 2020). By conducting social and environmental disclosures, the company will gain the existence of company activities that do not violate applicable regulations and norms (Solikhah et al., 2018). Thus, companies have a responsibility to carry out company activities in accordance with the norms that apply to society in order to maintain contracts with that society. If the community feels they have been harmed by the company due to the company's activities, the community revokes the legitimacy that has been given. This will threaten the interests of shareholders and the public interest as well as threaten the company's going concerns.

2.3 Stakeholder Theory

Freman (1984) in Depoers et al. (2016) characterizes partners as groups or individuals who can influence or be influenced by the accomplishment of organizational objectives. Stakeholder theory views the company as a nexus of contracts with stakeholders. This theory is comprehensive in its approach (Surifah & Rofiqoh, 2020). Stakeholder theory shows that it is important for companies to move to gain market advantage in achieving superior performance in their business (Purwaningsih & Wirajaya, 2014). In this manner, stakeholders have the same rights as shareholders in getting data almost the company.

Tauringana and Chithambo (2016) stated that as the business world develops, management is implicitly not only responsible to shareholders, but also to other stakeholders such as creditors, government, analysts, society, nature and the environment. Therefore, stakeholders have the same rights as shareholders in obtaining information about the company. Stakeholder theory relies on identifying company goals that will drive all actions and decisions to maximize company value, for the benefit of all stakeholders (Surifah & Rofiqoh, 2020). Therefore, company management needs to identify the relationships between all stakeholders and try to act in the best way for all interest groups.

2.4 The Effect of Company Size on Carbon Emission Disclosure

The size of the company shows that the measure of the company can be seen from the total assets. If the number of assets increases, the size of the company will increase and the invested capital will increase. Large-scale companies are companies that are subject to more public monitoring because the company's shareholders are also large. This encourages companies to make disclosures to gain public sympathy by providing information on the results of the company's social activities (Pratiwi, 2018). This is as stated by Choi et al. (2013), if a large company certainly has large resources and assets. And companies that have large assets will try to make disclosures, especially carbon emissions disclosures (Sekarini & Setiadi, 2022). Based on stakeholder theory, large companies certainly have considerable pressure. This includes environmental issues, companies must be quick in responding to environmental issues. Therefore, large companies are able to make quality disclosures and make many voluntary disclosures (Wiratno & Muaziz, 2020). Stakeholders demand that companies act ethically in their operating activities because this demand is closely related to the existence of the company in the future (Firmansyah et al., 2021). The company is considered as one of the sources of environmental problems, therefore the company needs to review the company's production and operation activities

due to external demands (Çankaya & Sezen, 2019). Research that has been conducted by Hariswan et al. (2022), Sekarini and Setiadi (2022), Abdullah et al. (2020), Selviana and Ratmono (2019), Solikhah et al. (2018), Choi et al. (2013), Luo et al. (2013) and Ghomi and Leung (2013) appeared that company size includes a critical impact on divulgence of carbon outflows. Based on the previous explanation, the author formulates a hypothesis, namely:

H_1. Company Size Affects Carbon Emissions Disclosure

2.5 Effect of Company Age on Carbon Emissions Disclosure

The age of a company is the length of time a company has been standing and able to compete so that the company continues to exist and can maintain business continuity. This means that the age of the company indicates the ability of the company to maintain business continuity and survive. That the longer the company survives, the more the company makes announcements as a responsibility to the community. Companies that have been operating for a long time or are getting older, then the company has a great ability to provide information about the company and more widely than newly established companies (Wati, 2019). In legitimacy theory, older companies tend to disclose environmental information because it improves the image and reputation of the company in the community, so that the company and activities gain community legitimacy (Dwinanda & Kawedar, 2019). Research that has been conducted by Asmeri et al. (2022), Hapsoro and Ambarwati (2018) and Ghomi and Leung (2013) stated that company age affects the disclosure of carbon emissions. Based on the previous explanation, the author formulates a hypothesis, namely:

H_2. Company Age Affects Carbon Emissions Disclosure

2.6 The Effect of Environmental Performance on the Disclosure of Carbon Emissions

Environmental perfomance is one of the achievements of companies and enterprises that protect the environment as part of their corporate responsibility caused by the impact of operating activities such as energy use and processing of raw materials (Rahmawati & Subardjo, 2017). Corporate environmental performance refers to the company's operational activities that can positively affect the environment (Hadjri et al., 2019). Environmental performance can be assessed by implementing environmental management according to the International Standard Organization (ISO) 14001. When a company that seeks to implement ISO 14001, the company has a commitment to continuously improve its environmental performance (Supriatna, 2021). The better the company's environmental performance, the higher the level of disclosure made by the company. This is because companies that have good enough performance will be more active in solving the problem of carbon emissions produced by the company (Maulidiavitasari & Yanthi, 2021). Legitimacy theory states that social behavior that occurs in companies must understand the values and rules that apply in the community. This theory is relevant to what is said Luo et al. (2019) that companies that disclose environmental information voluntarily aim to avoid bad media reports, this is because to maintain the company's good name and maintain company legitimacy. Meanwhile, based on stakeholder theory, it states that companies that make high environmental disclosures have good environmental performance because it will increase support from stakeholders. Research conducted by Giannarakis et al. (2017) found that environmental performance has a positive impact using two approaches, namely by paying attention to environmental performance in terms of output, direct and indirect greenhouse gas emissions and

companies have intentions in climate change mitigation, including climate change policies and climate change initiatives. This is research conducted by Hasan et al. (2021) found that environmental performance is able to drive carbon emissions disclosure using stakeholder theory because companies with high environmental performance will increase transparency for investors and stakeholders. Research that has been conducted by Amaliyah and Solikhah (2019), Maulidiavitasari and Yanthi (2021) and Ramadhan et al. (2019) which shows that there's an impact of environmental performance on divulgence of carbon emissions. Based on the previous explanation, the author formulates a hypothesis, namely:

H_3. Environmental Performance Affects Carbon Emissions Disclosure

2.7 The Effect of Women on the Board of Directors on Carbon Emissions Disclosure

In this case, the board of directors has responsibility for the greenhouse gas emissions strategy and reporting, it is important for companies to structure the board of executives so that the company has a good capacity to manage greenhouse gas emissions and other climate change related issues (Tauringana & Chithambo, 2016). Based on agency theory, company management becomes an agent to develop and manage company performance. The company can be said to be great in case it has great corporate administration, this is characterized by the diversity of board members, this is better than board members consisting only of men. Female directors have cognitive thinking that is different from men, gender diversity makes them tend to consider, discuss and integrate information in making decisions (Monica et al., 2021). Ben-Amar and McIlkenny (2015) state that the number of boards of directors increases, it will affect the policy in decision making. Liao et al. (2015) asserted that the high scale of women on the board of directors will make environmental disclosure more open. He et al. (2021) which states that female directors have an influence on the disclosure of carbon emissions based on their level of education and financial background. Research conducted by Hariswan et al. (2022), He et al. (2021), Ben-Amar and McIlkenny (2015), and Liao et al. (2015) which states that ladies on the board of directors have an impact on the disclosure of carbon emissions. Based on the previous explanation, the author formulates a hypothesis, namely:

H_4. Women on the Board Affects Carbon Emissions Disclosure

3. Research Method

This research is quantitative research, namely research methods in the form of numbers and analysis using statistics that can be classified, concrete, observable and measurable (Sugiyono, 2018). The data sources used in this study are secondary data obtained from financial reports, annual reports and sustainability reports of energy sector companies listed on the Indonesia Stock Exchange (IDX) from 2019-2021 which have been published from the IDX official website, namely www.idx.co.id. In addition, secondary data was also obtained from the site of the company that was sampled in this study. This study uses the 2019-2021 period because researchers chose the 2019-2021 period because researchers wanted to update the analysis of these factors affecting energy sector companies in disclosing carbon emissions. And there is a Minister of Energy and Mineral Resources Regulation No. 22 of 2019 which contains guidelines for carrying out GHG inventory and mitigation in the energy sector which came into force in 2019. This regulation exists as a reference for interested parties in the energy sector in conducting GHG inventory and mitigation.

The population in this think about are all energy sector companies recorded on the Indonesia Stock Trade (IDX) from 2019-2021. The sample of this study was determined based on using purposive sampling method. The sample criteria for energy companies sampled in this study are 1) Energy companies recorded on the Indonesia Stock Trade in 2019-2021; and 2) Companies that publish complete financial reports, annual reports or sustainability reports during the 2019-2021 observation period. Based on the predetermined sample criteria, there were 60 companies that met the sample criteria. Thus, the sample in this study was 60 companies during the addressing period and the number of observations for 3 years was 180 samples. The data collection method in this think about employments the documentation strategy, specifically by studying, classifying and analyzing and analyzing auxiliary information within the frame of monetary reports of energy companies that are inspected within the think about. The following table presents the operational definition and measurement of variables in this study:

Table 1. Operational Definition and Variable Measurement Matrix

Variable	Definition	Measurement	Scale
Carbon Emission Disclosure (Y)	Carbon Emissions Disclosure is a disclosure to assess an organization's carbon emissions and set targets for reducing those emissions (Cahya, 2017).	Carbon Emissions Checklist (Choi et al., 2013). With formula: $CED = \frac{\sum di}{M}$	Nominal
Company Size (X1)	The size referred to as a measure or parameter related to all total asset that will play a role in the disclosure of carbon emissions, both small and large companies (Septriyawati & Anisah, 2019).	Natural logarithm of total assets: Ukuran perusahaan = Ln Total Aset (Septriyawati & Anisah, 2019).	Ratio
Company Age (X2)	The age of the company is an indication of the company and its ability to survive in the business world which reflects the existence of the company that exists until now (Apriliani & Dewayanto, 2018).	The age of the company is measured from the time the company was founded until it runs its operations (Agustia & Suryani, 2018). Company age = Year of research - Year the company was founded	Nominal
Environmental Perfomane (X3)	Environmental performance is also an effort made by the company in maintaining and creating a better environment (Hilmi et al., 2020).	Environmental performance can be measured using indicators of implementation and obtaining ISO 14001 certification. The environmental performance measures are as follows: - Companies that do not implement and are not ISO 14001 certified are given 0 points, - Companies that implement environmental management standards in accordance with ISO 14001 are given 1 point, - Companies that implement and obtain ISO 14001 certification are given 2 points (Amaliyah & Solikhah, 2019).	Ordinal

Table 1. Operational Definition and Variable Measurement Matrix (Continued)

Variable	Definition	Measurement	Scale
Women on the Board of Directors (X4)	Women directors have different cognitive thinking than men, and gender diversity in the board of directors makes it more likely to consider, discuss and integrate information in making decisions. Female directors can also improve communication with stakeholders regarding environmental issues (He et al., 2021).	Scoring based on the proportion of female board members (Ben-Amar & McIlkenny, 2015).	Nominal

The data analysis method used in this research is multiple linear regression analysis. The sequence of data analysis in this study is descriptive statistical analysis, normality test, classical assumption test, multiple linear regression analysis, coefficient of determination test, F test and hypothesis testing (t test).

4. Results and Discussion

4.1 Descriptive Statistics Analysis

Descriptive analysis is the analysis stage of the data testing process whose results are used as sufficient evidence to draw conclusions. In the current study, descriptive statistics were used to measure or calculate the mean, minimum, maximum and standard deviation values for the dependent variable and the independent variable. The reason of descriptive statistical analysis is to get significant data contained within the information and the comes about are utilized to fathom issues. The following are the results of descriptive analysis of the sample data of this study:

Table 2. Descriptive Statistics

Variabel	N	Min	Max	Mean	Std. Deviation
Company Size	180	20.54	36.56	28.8536	2.39977
Company Age	180	4.00	54.00	25.5333	11.58134
Environmental Perfomance	180	.00	2.00	1.1778	.92848
Carbon Emissions Disclosure	180	.00	3.00	.4556	.69573
Pengungkapan Emisi Karbon	180	.00	.94	.3642	.32010
Valid N (listwise)	180				

Based on table 2, the size of the company has the smallest size of 20.54 and the largest is 36.56. As well as the average size of energy sector companies of 28.85 which means that the average size of energy sector companies is large. The company age variable which shows that the average age value of energy sector companies is 25.53, this means that the age of energy sector companies is in the middle category. In this category the company is still in its growth period (Supramono et al., 2023). The results of descriptive analysis of environmental performance show that there are still energy sector companies that have not implemented environmental management according to ISO 14001 environmental standards. It can be seen from the environmental performance value, which is 0. While the average value of environmental performance of energy companies is 1.778. This means that on average the company has implemented and obtained ISO 14001 certification in environmental management. Meanwhile, women on the board of directors have a minimum value of 0, meaning that energy sector companies still have companies that do not have women on the board of directors. The average value of women on the board of

directors is 0.4556 or 45.56%. This means that most energy sector companies in the study period did not have women on the board of directors or only about 45.56% of companies had women on the board of directors.

4.2 Normality Test

The normality test is valuable for deciding whether the data that has been collected is ordinarily disseminated or the data taken from a typical populace (Firdaus, 2019). The following are the results of the normality test of the research sample:

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		180
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.25873951
Most Extreme Differences	Absolute	.063
	Positive	.059
	Negative	-.063
Test Statistic		.063
Asymp. Sig. (2-tailed)		.078[c]

From the normalization test results in table 3 shows that the Asymp. Sig (2-tailed) of 0.78 is greater than 0.05 (0.78>0.05). This implies that all data is normally disseminated or the research data has met the assumption of normality.

4.3 Classical Assumption Test

The classic assumption tests used in this study are multicollinearity test, heteroscedasticity test and autocorrelation test (Ghozali, 2018). Multicollinearity aims to prove whether there is a correlation between the independent variables in the model or in the form of regression (Ghozali, 2018). Based on the tests that have been carried out, it is found that all independent variables have a VIF value smaller than 10, namely company size VIF value of 1,110, company age VIF value of 1,100, environmental performance VIF value of 1,253 and women on the board of directors VIF value of 1,124 and the tolerance value of all independent variables is greater than 0.1, namely company size tolerance value of 0.900, company age tolerance value of 0.909, environmental performance tolerance value of 0.798 and women on the board of directors tolerance value of 0.889 so that there is no multicollinearity. The autocorrelation test is essentially used to test whether in a linear regression model there is a correlation between confounding errors in period t and errors in period t-1 (previous period). Ghozali (2018) the regression model is good if there is no autocorrelation. To determine the presence or absence of autocorrelation, testing is necessary. From the test results using the Run test statistic, the asymptotic significant results (Asymp. Sig. (2-Tailed) of 0.654. This value is greater than 0.05 (0.654>0.05), so it can be concluded that there is no autocorrelation. The heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another. From the tests that have been carried out with the Glejser test, the results show that the sig value of the variable is greater than 0.05, namely company size sig value 0.926, company age sig value 0.370, environmental performance sig value 0.053 and women on the board of directors 0.088. It is stated that the research data does not occur heteroscedasticity in the research model.

4.4 Multiple Linear Regression Test

Regression analysis can demonstrate that there's a relationship between two or more variables and demonstrate the heading between the independent and dependent variables (Ghozali, 2018). Regression test to assess the value of the regression coefficient, namely the t-statistic value and significance value.

Table 4. Multiple Linear Regression Test Results

Variabel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	**-1.889**	**.511**		**-3.693**	**.000**
Company Size	.388	.092	.272	4.229	.000
Company Age	.026	.017	.095	1.490	.138
Enviromental Perfomance	.215	.033	.441	6.448	.000
Women on the Board of Directors	.013	.038	.022	.336	.737

Table 4 it can be concluded that the multiple linear regression equation created in this think about is as takes after:

$$\mathbf{Y = -1,889 + 0,388X_1 + 0,026X_2 + 0,215X_3 + 0,013X_4 + e} \quad (1)$$

Y = Emission Carbon Disclosure
X1 = Company Size
X2 = Company Age
X3 = Environmental perfomance
X4 = Women on the Board of Directors
a0 = Constant
β1-β4 = Regression Coefficient
e = *Error*

4.5 Hypothesis Test (t Test)

The T test points to test how much impact one independent variable exclusively has in clarifying the variety within the dependent variable (Ghozali, 2018).

Test H_1 : The Effect of Company Size on Carbon Emissions Disclosure

Table 4, the calculated t value is 4.229. The results of this study show t count > t table (4.229> 1.97353) and the significance value is less than 0.05 (0.000> 0.05), so company size has an effect on carbon emission disclosure. Based on the test comes about, it can be concluded that **H_1 is accepted.**

Company size not only reflects the company's resources but company size also reflects the company's operational activities. The greater the resources owned by the company, the greater the company's operational activities (Selviana & Ratmono, 2019). Companies on a large scale are companies that are subject to more public monitoring because the company's shareholders are also large. This encourages companies to make disclosures in order to gain public sympathy by providing information on the results of company activities. This is as stated by Choi et al. (2013), if a large company certainly has large resources and assets. And companies that have large assets will try to make disclosures, especially carbon emissions disclosures (Sekarini & Setiadi, 2022). This is consistent with stakeholder theory, large companies certainly have significant pressures. This includes environmental issues, companies must be quick in responding to environmental issues. Therefore, large companies are able to make quality disclosures and make a lot of voluntary

disclosures. Stakeholders demand that companies act ethically in their operating activities because this demand is closely related to the existence of the company in the future (Firmansyah et al., 2021). The findings of this research are consistent with studies carried by Afrizal et al. (2023), Hariswan et al. (2022), Sekarini and Setiadi (2022), Abdullah et al. (2020), Selviana and Ratmono (2019), Solikhah et al. (2018), Gonzalez and Ramírez (2016), Choi et al. (2013), Luo et al. (2013), and Ghomi and Leung (2013), showed that company size has a significant effect on disclosure of carbon emissions.

Test H_2 : The Effect of Company Age on Carbon Emissions Disclosure

Based on table 4, the calculated t value is 1.490. The results of this study show t count < t table (1.490 < 1.97353) and the significance value is greater than 0.05 (0.138 > 0.05), so company age does not affect the disclosure of carbon emission. Based on the test results, it can be concluded that **H_2 is rejected**.

Based on table 2, the average age of the company is 25.53 years, which is categorized as a medium-sized company or in its infancy (Supramono et al., 2023). Companies in the growth period tend to focus on development and profit-making strategies to maintain their existence. This study does not support legitimacy theory which states that older companies will tend to make environmental disclosures because it will improve the company's reputation in the community so that the company's operational activities receive public legitimacy (Dwinanda & Kawedar, 2019). However, companies that have been set up for a long time have a good strategy only to maintain the company's survival. And do not have a focus on getting support from the community. Companies that have a long age or have just been established tend to focus more on developing strategies to achieve profits. The findings of this research are consistent with studies carried by by Barusman et al. (2020) proving that company age has no effect on disclosure of carbon emissions. This research is not in line with research conducted by Afrizal et al. (2023), Asmeri et al. (2022), Hapsoro and Ambarwati (2018), and Ghomi and Leung, (2013), stated that company age affects the disclosure of carbon emissions

Test H_3 : The Effect of Environmental Performance on Carbon Emissions Disclosure

Based on table 4, the calculated t value is 6.448. The results of this study show t count > t table (6.448 > 1.97353) and the significance value is less than 0.05 (0.000 < 0.05), so that environmental performance influences the disclosure of carbon emissions. Based on the test results, it can be concluded that **H_3 is accepted**.

Environmental performance is one of the company's performance that protects the surrounding environment as a form of corporate responsibility caused by the impact of operating activities such as energy use and processing of raw materials (Rahmawati & Subardjo, 2017). Table 2 shows that environmental performance is seen to have an average value of 1.778, which means that on average energy sector companies have implemented environmental management according to ISO 14001. Companies that have good environmental performance will tend to disclose carbon emissions. This is because companies that implement environmental performance according to standards and obtain ISO 14001 certification will be encouraged to disclose carbon emissions. This study can confirm legitimacy theory, which states that social behavior that occurs in companies must understand the values and rules that apply in the community. Companies that have good environmental performance will gain legitimacy from society because the company's values are considered to be in accordance with the values that apply in societ. Luo et al. (2019) that companies that disclose environmental information aim to avoid bad media reports, this is due to maintaining the company's good name and maintaining the company's legitimacy Meanwhile, stakeholder theory states that companies that make high

environmental disclosures have good environmental performance because it will increase support from stakeholders. Therefore, Corporate carbon emissions will often be disclosed more frequently when environmental performance is good. The findings of this research are consistent with studies carried by Ramadhan et al. (2019), Maulidiavitasari and Yanthi (2021), Prasetya and Yulianto (2018) and Apriliana (2019) It implies that environmental performance has an impact on carbon emission disclosure.

Test H_4 : The Effect of Women on the Board of Directors on Carbon Emissions Disclosure

Based on table 4, the calculated t value is 0.336. The result shows t count > t table (0.336 < 1.97353) and the significance value is greater 0.05 (0.737 > 0.05), so women in The disclosure of carbon emissions is not influenced by the board of directors. It can be inferred from the test results that **H_4 is rejected.**

The findings proved that the disclosure of carbon emissions was unaffected by the variable of women on the board of directors. This is due to the fact that only 45.56% of companies in the energy industry during the research period had women on their boards of directors, or a large number of enterprises still did not have any women on their boards. In addition, this can also be caused by the sector factor studied, namely energy sector companies which are certainly more dominated by men. According to Ararat and Sayedy (2019) the reason why there is no influence on the disclosure of carbon emissions is also due to "Gender Marginalization". Gender marginalization is a pattern of unfair gender behavior and treatment or is often rooted in history, practices, beliefs and social structures (Sulistyowati & Tumirin, 2023). This research is not in line with agency theory which states that company management as an agent for the development and management of company performance can be said to be good if it has corporate governance with diversity in board members (Monica et al., 2021). The findings of this research are consistent with studies carried by Sulistyowati and Tumirin (2023), Ararat and Sayedy (2019) and Kılıç and Kuzey (2019) which states that women on the board of directors have no effect on the disclosure of carbon emissions. However, this research is not in line with research conducted by Hollindale et al. (2019), Monica et al. (2021) Hariswan et al. (2022), Ben-Amar and McIlkenny (2015) and Kim (2022) states that women on the board of directors influence the disclosure of carbon emissions.

4.6 F Statistical Test

In essence, the F statistical test indicates whether the study's regression model is significant or not. The following are the results of the simultaneous significant test of sample data in this study:

Table 5. F Statistical Test Result

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.376	4	1.594	23.279	.000[b]
Residual	11.983	175	.068		
Total	18.359	179			

Based on table 5, It is evident from the f statistical test findings that the f count (F Statistic) value is 0.000 or less than 0.05. This indicates that the study's regression model is either good or significant.

4.7 Determination Coefficient Test

In basically, the coefficient of determination (R^2) quantifies how well the model can account for the dependent variable. From the test results, the adjusted R Square (R2) value is 0.332, thus it can be concluded that the company's carbon emissions disclosure is influenced by independent variables, namely company size, company age, environmental performance, and women on the board of directors at 33.2% while 66 .8% is influenced by other factors or other independent variables that were not observed in this study.

5. Conclusion

It could be done to draw the conclusion that company size and environmental performance have an impact on the disclosure of carbon emissions based on the analysis and hypothesis testing conducted in this study. Meanwhile, The disclosure of carbon emissions is unaffected by the company's age or the presence of women on the board of directors.

This finding that firm size and environmental performance influence carbon emissions disclosure has direct implications for companies. These findings can assist companies in developing carbon emission management strategies by considering factors such as company size and environmental performance. In addition, the results of this study may increase corporate awareness of the importance of corporate sustainability in business practices.

There are a number of shortcomings in this study that need to be addressed and refined for subsequent investigations. The study has certain drawbacks. Firstly, the study's adjusted R Square (or coefficient of determination) is only 33.2%, which suggests that further research should be done to acquire better research outcomes. Furthermore, some businesses continue to refrain from releasing Sustainability Reports. Third, the study's sample consists solely of companies in the energy industry that are listed on the IDX.

In order to present a more comprehensive picture of the disclosure of carbon emissions, additional elements that are thought to be influential can be taken into consideration in the study proposals that can be made. Furthermore, to acquire better and more accurate study results, future research can prolong the research time and add or use additional sectors that contribute to carbon emissions in Indonesia in order to broaden the research sample.

References

Abdullah, M. W., Musriani, R., Syariati, A., & Hanafie, H. (2020). Carbon Emission Disclosure in Indonesian Firms: The Test of Media-Exposure Moderating Effects. *International Journal of Energy Economics and Policy, 10*(6), 732–741. https://doi.org/10.32479/IJEEP.10142.

Afrizal, Safelia, N., & Muda, I. (2023). Determinants of Carbon Emission Disclosure and Sustainability Reporting and Their Implications for Investors' Reactions: The Case of Indonesia and Malaysia. *International Journal of Management and Sustainability, 12*(2), 271–288. https://doi.org/10.18488/11.v12i2.3375.

Agustia, Y. P., & Suryani, E. (2018). Pengaruh Ukuran Perusahaan, Umur Perusahaan, Leverage, dan Profitabilitas terhadap Manajemen Laba (Studi pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia Periode 2014-2016). *Jurnal Aset (Akuntansi Riset), 10*(1), 71–82. https://doi.org/10.17509/jaset.v10i1.12571.

Amaliyah, I., & Solikhah, B. (2019). Pengaruh Kinerja Lingkungan dan Karakteristik Corporate Governance terhadap Pengungkapan Emisi Karbon. *Journal of Economic, Management, Accounting and Technology, 2*(2), 129–141. https://doi.org/10.32500/jematech.v2i2.720.

Anshari, R., & Isnalita, I. (2020). Kepemilikan Keluarga dan Carbon Emission Disclosure pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia. *Jurnal Akuntansi Aktual, 7*(1), 11–22. https://doi.org/10.17977/um004v7i12020p11.

Apriliana, E. (2019). Pengaruh Tipe Industri, Kinerja Lingkungan, dan Profitabilitas terhadap Carbon Emission Disclosure. *Widyakala Journal: Journal of Pembangunan Jaya University, 6*(1), 84-95. https://doi.org/10.36262/widyakala.v6i1.149.

Apriliani, M. T., & Dewayanto, T. (2018). Pengaruh Tata Kelola Perusahaan, Ukuran Perusahaan dan Umur Perusahaan terhadap Kinerja Perusahaan. *Diponegoro Journal of Accounting, 7*(1), 1-10.

Ararat, M., & Sayedy, B. (2019). Gender and Climate Change Disclosure: An Interdimensional Policy Approach. *Sustainability, 11*(24), 1–19. https://doi.org/10.3390/su11247217.

Arif, A. (2023). *Emisi Karbon Dioksida Mencapai Rekor Tertinggi pada 2022*- Kompas.id. Retrieved March 12, 2023, from www.kompas.id website: https://ariwww.kompas.id/baca/humaniora/2023/03/02/emisi-karbon-dioksida-mencapai-rekor-tertinggi-pada-2022.

Asmeri, R., Anggraini, M. D., & Amidah, N. O. (2022). Pengaruh Profitabilitas, Umur Perusahaan dan Debt to Equity Ratio terhadap Pengungkapan Emisi Karbon pada Perusahaan Manufaktur yang Terdaftar di BEI dari Tahun 2017-2018. *Pareso Jurnal: Jurnal Pengembangan Ilmu Akuntansi dan Keuangan, 4*(4), 881–898.

Barusman, A. R. P., Nurdiawansyah, Warganegara, T. L. P., & Mega, S. A. (2020). Influence of Company Characteristics on Carbon Disclosure Emissions on Manufacturing Companies in Indonesia. *International Journal of Advanced Science and Technology, 29*(6), 1423-1431.

Ben-Amar, W., & McIlkenny, P. (2015). Board Effectiveness and the Voluntary Disclosure of Climate Change Information. *Business Strategy and the Environment, 24*(8), 704–719. https://doi.org/10.1002/bse.1840.

Cahya, B. T. (2017). Carbon Emission Disclosure: Ditinjau dari Media Exposure, Kinerja Lingkungan dan Karakteristik Perusahaan Go Public Berbasis Syariah di Indonesia. *Nizham: Jurnal Studi Keislaman, 4*(2), 170–188.

Çankaya, S. Y., & Sezen, B. (2019). Effects of Green Supply Chain Management Practices on Sustainability Performance. *Journal of Manufacturing Technology Management, 30*(1), 98–121. https://doi.org/10.1108/JMTM-03-2018-0099.

Choi, B. 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.

Damert, M., Paul, A., & Baumgartner, R. J. (2017). Exploring the Determinants and Long-Term Performance Outcomes of Corporate Carbon Strategies. *Journal of Cleaner Production, 160*, 123–138. https://doi.org/10.1016/j.jclepro.2017.03.206.

Depoers, F., Jeanjean, T., & Jérôme, T. (2016). Voluntary Disclosure of Greenhouse Gas Emissions: Contrasting the Carbon Disclosure Project and Corporate Reports.

Journal of Business Ethics, 134, 445–461. https://doi.org/10.1007/s10551-014-2432-0.

Dwinanda, I. M., & Kawedar, W. (2019). Pengaruh Belanja Modal, Umur Perusahaan, Pertumbuhan, dan Rasio Utang terhadap Pengungkapan Emisi Karbon dan Reaksi Saham. *Diponegoro Journal of Accounting, 8*(4), 1-12.

Fernanda, G. (2022). *Analisa Perbandingan Kinerja dan Kesesuaian Pengungkapan Emisi Karbon Berdasarkan GRI Standards: Studi Kasus pada 5 Perusahaan Sektor Energi yang Terdaftar di Bursa Efek Indonesia Tahun 2018-2020* (Undergraduate Thesis, Katolik Parahyangan University). https://repository.unpar.ac.id/handle/123456789/14812.

Firdaus, M. (2019). *Ekonometrika: Suatu Pendekatan Aplikatif (Edisi 3; R. Damayanti, Ed.)*. Jakarta: Bumi Aksara.

Firmansyah, A., Jadi, P. H., Febrian, W., & Sismanyudi, D. (2021). Pengaruh Tata Kelola Perusahaan dan Ukuran Perusahaan terhadap Pengungkapan Emisi Karbon di Indonesia. *Jurnal Informasi, Perpajakan, Akuntansi, dan Keuangan Publik, 16*(2), 303–320. https://doi.org/10.25105/jipak.v16i2.9420.

Ghomi, Z. B., & Leung, P. (2013). An Empirical Analysis of the Determinants of Greenhouse Gas Voluntary Disclosure in Australia. *Accounting and Finance Research, 2*(1), 110–127. https://doi.org/10.5430/afr.v2n1p110.

Ghozali, I. (2018). *Aplikasi Analisis Multivariete dengan Program IBM SPSS 25 (Edisi 9)*. Semarang: Badan Penerbit Universitas Diponegoro.

Giannarakis, G., Eleni, Z., & Sariannidis, N. (2017). The Impact of Carbon Performance on Climate Change Disclosure. *Business Strategy and the Environment, 26*(8), 1078–1094. https://doi.org/i10.1002/bse.1962.

Gonzalez, J. M., & Ramírez, Z. (2016). Voluntary Carbon Disclosure by Spanish Companies: An Empirical Analysis. *International Journal of Climate Change Strategies and Management, 8*(1), 57–79. https://doi.org/10.1108/IJCCSM-09-2014-0114.

Grediani, E., Yustrianthe, R. H., & Niandari, N. (2020). Pengaruh Corporate Governance terhadap Pengungkapan Emisi Gas Rumah Kaca dengan Peran Audit Internal sebagai Pemoderasi. *Jurnal Ilmiah Akuntansi, 5*(2), 285–307. https://doi.org/10.23887/jia.v5i2.28371.

Hadjri, M. I., Prizade, B., Zunaidah, & Farla, W. (2019). Green Human Resource Management dan Kinerja Lingkungan: Studi Kasus pada Rumah Sakit di Kota Palembang. *Jurnal Inovasi Bisnis, 8*, 182-192.

Hapsoro, D., & Ambarwati. (2018). Antecedents and Consequences of Carbon Emissions' Disclosure: Case Study of Oil, Gas and Coal Companies in Non-Annex 1 Member Countries. *Journal of Indonesian Economy and Business: JIEB, 33*(2), 99–111.

Hariswan, A. M., Nur, E. D., & Mela, N. F. (2022). Pengungkapan Emisi Karbon Perusahaan Pertambangan di Indonesia. *Jurnal Al-Iqtishad, 18*(1), 19–41. https://doi.org/10.24014/jiq.v18i1.16286.

Hasan, N. H., Alfan, E., & Sapiei, N. S. (2021). Carbon Disclosure: A Systematic Literature Review of Determinants. *International Journal of Accounting, Finance and Business (IJAFB), 61*(38), 183–201. https://doi.org/10.1111/acfi.12757.

He, R., Zhou, M., Liu, J., & Yang, Q. (2021). Female Directors and Carbon Information Disclosure: Evidence from China. *Discrete Dynamics in Nature and Society,*

2021(1), 1–16. https://doi.org/10.1155/2021/7772601.

Hendrawaty, E. (2017). *Excess Cash dalam Perspektif Teori Keagenan*. Bandar Lampung: AURA (Anugrah Utama Raharja).

Hilmi, H., Puspitawati, L., & Utari, R. (2020). Pengaruh Kompetisi, Pertumbuhan Laba dan Kinerja Lingkungan terhadap Pengungkapan Informasi Emisi Karbon pada Perusahaan. *OWNER: Riset dan Jurnal Akuntansi, 4*(2), 296-307. https://doi.org/10.33395/owner.v4i2.232.

Hollindale, J., Kent, P., Routledge, J., & Chapple, L. (2019). Women on Boards and Greenhouse Gas Emission Disclosures. *Accounting & Finance, 59*(1), 277–308. https://doi.org/10.1111/acfi.12258.

Irwhantoko, I., & Basuki, B. (2016). Carbon Emission Disclosure: Studi pada Perusahaan Manufaktur Indonesia. *Jurnal Akuntansi dan Keuangan, 18*(2), 92–104. https://doi.org/10.9744/jak.18.2.92-104.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics, 3*(4), 305–360.

Kelvin, C., Daromes, F. E., & Ng, S. (2017). Pengungkapan Emisi Karbon Sebagai Mekanisme Peningkatan Kinerja Untuk Menciptakan Nilai Perusahaan. *Dinamika Akuntansi, Keuangan dan Perbankan, 6*(1), 1-18.

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), 1-15. https://doi.org/10.3390/ijerph192013247.

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.

Liao, L., Luo, L., & Tang, Q. (2015). Gender Diversity, Board Independence, Environmental Committee and Greenhouse Gas Disclosure. *The British Accounting Review, 47*(4), 409–424. https://doi.org/10.1016/j.bar.2014.01.002.

Luo, L., & Tang, Q. (2014). Does Voluntary Carbon Disclosure Reflect Underlying Carbon Performance?. *Journal of Contemporary Accounting & Economics, 10*(3), 191–205. https://doi.org/10.1016/j.jcae.2014.08.003.

Luo, L., Tang, Q., & Lan, Y. (2013). Comparison of Propensity for Carbon Disclosure between Developing and Developed Countries: A Resource Constraint Perspective. *Accounting Research Journal, 26*(1), 6–34. https://doi.org/10.1108/ARJ-04-2012-0024.

Luo, W., Guo, X., Zhong, S., & Wang, J. (2019). Environmental Information Disclosure Quality, Media Attention and Debt Financing Costs: Evidence from Chinese Heavy Polluting Listed Companies. *Journal of Cleaner Production, 231*, 268–277. https://doi.org/10.1016/j.jclepro.2019.05.237.

Maulidiavitasari, J., & Yanthi, M. D. (2021). Pengaruh Kinerja Lingkungan terhadap Carbon Emission Disclosure dengan Dewan Komisaris Independen sebagai Variabel Moderasi. *Akuntabilitas, 15*(1), 1–18. https://doi.org/10.29259/ja.v15i1.11849.

Monica, M., Daromes, F. E., & Ng, S. (2021). Women on Boards as a Mechanism to Improve Carbon Emission Disclosure and Firm Value. *Jurnal Ilmiah Akuntansi*

dan Bisnis, 16(2), 343-358. https://doi.org/10.24843/jiab.2021.v16.i02.p11.

Niza, T. C., & Ratmono, D. (2019). Pengaruh Karakteristik Corporate Governance terhadap Pengungkapan Emisi Gas Rumah Kaca. *Diponegoro Journal of Accounting, 8*(4), 1-12.

Prasetya, R. A., & Yulianto, A. (2018). Analysis of Factors Affecting the Disclosure of Corporate Carbon Emission In Indonesia. *Jurnal Dinamika Akuntansi, 10*(1), 71-81. https://doi.org/10.15294/jda.v10i1.12653.

Pratiwi, D. N. (2018). Implementasi Carbon Emission Disclosure di Indonesia. *Jurnal Ilmiah Akuntansi dan Bisnis, 13*(2), 101–112.

Purwaningsih, N. K. I., & Wirajaya, I. G. A. (2014). Pengaruh Kinerja pada Nilai Perusahaan dengan Corporate Social Responsibilty sebagai Variabel Pemoderasi. *E-Jurnal Akuntansi Universitas Udayana, 7*(3), 598–613.

Rahmawati, M. I., & Subardjo, A. (2017). Pengaruh Pengungkapan Lingkungan dan Kinerja Lingkungan terhadap Kinerja Ekonomi yang Dimoderasi Good Corporate Governance. *Jurnal Buletin Studi Ekonomi, 22*(2), 200–226.

Ramadhan, R. T., Ermaya, H. N. L., & Wibawaningsih, E. J. (2019). Determinasi Pengungkapan Emisi Karbon pada Perusahaan di Indonesia. *Jurnal Akuntansi dan Pajak, 22*(1), 1–13. https://doi.org/10.29040/jap.v22i1.2873.

Razak, B., & Helmy, H. (2020). Pengaruh Dewan Direksi Wanita, Dewan Komisaris Wanita dan Kualitas Pengungkapan Corporate Social Responsibility terhadap Manajemen Laba (Studi Empiris pada Perusahaan yang Terdaftar di BEI dan Menerbitkan Laporan Keberlanjutan Tahun 2015-2018). *Jurnal Eksplorasi Akuntansi (JEA), 2*(4), 3434–3451. https://doi.org/10.24036/jea.v2i4.294.

Sekarini, L. A., & Setiadi, I. (2022). Pengaruh Leverage, Profitabilitas, Ukuran Perusahaan dan Kinerja Lingkungan terhadap Pengungkapan Emisi Karbon Perusahaan (Studi Empiris pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia Periode 2014-2018). *Kompartemen : Jurnal Ilmiah Akuntansi, 19*(2), 203-212. https://doi.org/10.30595/kompartemen.v19i2.8627.

Selviana & Ratmono, D. (2019). Pengaruh Kinerja Karbon, Karakteristik Perusahaan dan Kinerja Lingkungan terhadap Pengungkapan Emisi Karbon. *Diponegoro Journal of Accounting, 8*(3), 1–10.

Septriyawati, S., & Anisah, N. (2019). Pengaruh Media Exposure, Ukuran Perusahaan, Profitabilitas dan Leverage terhadap Pengungkapan Emisi Karbon pada Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia Periode 2014-2018. *SNEB : Seminar Nasional Ekonomi dan Bisnis Dewantara, 1*(1), 103–114. https://doi.org/10.26533/sneb.v1i1.417.

Solikhah, B., Wahyudin, A., Yulianto, A., & Fathudin, M. I. (2018). Carbon Emission Disclosure on Manufacturing Companies in Indonesia. *Proceeding of International Conference: 3rd SHIELD*, 178–184.

Sugiyono. (2018). *Metode Penelitian Bisnis Pendekatan Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.

Sulistyowati, I., & Tumirin, T. (2023). Dewan Direksi Wanita dan Komite Keberlanjutan dalam Mengungkapkan Emisi Karbon. *Journal of Culture Accounting and Auditing, 2*(1), 188-202. https://doi.org/10.30587/jcaa.v2i1.5823.

Supramono, Listiani, N., Nugrahanti, Y. W., & Damayanti, T. W. (2023). *Karakteristik*

dan Nilai Perusahaan yang Dikelola Manajer Overconfidence (1st Ed.). Sidoarjo: Uwais Inspirasi Indonesia.

Supriatna, J. (2021). *Pengelolaan Lingkungan Berkelanjutan* (1st Ed.). Jakarta: Yayasan Pustaka Obor Indonesia.

Surifah & Rofiqoh, I. (2020). *Corporate Governance Badan Usaha Milik Negara (2nd Eddition)*. Makassar: Graha Aksara Makassar.

Tauringana, V., & Chithambo, L. (2016). Determinants of Risk Disclosure Compliance in Malawi: A Mixed-Method Approach. *Journal of Accounting in Emerging Economies, 6*(2), 111-137. https://doi.org/10.1108/JAEE-03-2014-0015.

Titisari, K. H. (2020). *Up Green CSR (Refleksi Edukatif Riset CSR dalam Pengembangan Bisnis) (1st Eddition; K. B. Setiayawan, Ed.)*. Surakarta: CV Kekata Group.

Wati, L. N. (2019). *Model Corporate Social Responsibility (CSR)*. Ponorogo: Myria Publisher.

Wiratno, A., & Muaziz, F. (2020). Profitabilitas, Ukuran Perusahaan, dan Leverage Mempengaruhi Pengungkapan Emisi Karbon di Indonesia. *Jurnal Ekonomi, Bisnis, dan Akuntansi, 22*(1), 28–41. https://doi.org/10.32424/jeba.v22i1.1562.