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The Factors That Influence Carbon Emission Disclosure In Manufacturing Companies Listed On The Idx For The Period 2020-2022

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ABSTRACT

This study aims to investigate the factors that influence the disclosure of carbon emissions in manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the period 2020-2022. This study focuses on several variables, such as the global reporting initiative (GRI), external auditor reputation, and leverage to determine their influence on the company's decision to disclose carbon emissions. This study uses quantitative methods with the population being all manufacturing companies listed on the IDX. Using purposive sampling method, 63 companies were selected as samples. Data analysis was conducted using multiple regression analysis. The results of this study indicate that GRI and external auditor reputation have a positive influence and leverage has a negative influence on carbon emissions disclosure. These findings support the importance of companies to continuously improve their environmental performance in an effort to reduce the impact of global climate change. The implications of this study are relevant for companies, investors, and policy makers focused on improving sustainability practices in the corporate sector.

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1. INTRODUCTION

Currently, many natural disasters occur both in Indonesia and in other countries. This is due to the phenomenon of global warming, which has become an increasingly important political and business issue for several countries. In Indonesia, the phenomenon of carbon emission has become an event that takes enough attention from the public. The 2018 forest and land fires in Palangkaraya, Riau and surrounding areas have had a major impact on environmental pollution in Indonesia and according to the World Resources Institute, these fires are the worst since 1997. The range of carbon emissions generated by the event could be equivalent to 4,500-7,800 gallons of gasoline or about 40

metric tons of CO2. According to one of the founders of the Center for International Cooperation in Sustainable Management of Tropical Peatland (CIMTROP), about 2.6 million hectares of land burned between June-October 2018, the fires were widespread because they were also triggered by drought and exacerbated by the effects of EL Nino. In 2015-2018, Indonesia was among the top 3 countries contributing to carbon emissions with 1.35 giga tons of CO2 (www.bbc.com/indonesia).

The fires have created such thick haze that Indonesia is emitting much higher carbon emissions than the United States, which has been the second largest contributor to carbon emissions after China. Carbon emissions from forest and land fires in Indonesia have exceeded the US average daily carbon emissions for 26 days out of 44 since early September. The conversion of peatlands into plantations is cited as one of the triggers for the massive fires that have greatly increased greenhouse gas emissions in Indonesia.

In the past year global carbon emissions have risen for the first time as Australia's targets in the 2030 Paris Agreement were missed. The Paris Agreement is considered a humanitarian breakthrough. Indonesia's effort to reduce carbon emissions by 29% by 2030 was signatory to the Paris Agreement. One way to help reduce carbon levels in the United Nations (UN) world is by drafting an amendment, the Kyoto Protocol, which is an amendment to the UN Framework Convention on Climate Change (UNFCCC). Indonesia plans to reduce carbon emissions by 26% to 29% from 2020 to 2030. Although, the percentage of carbon reduction only goes up by about 3%, by percentage metrics it is a big number.

Indonesia has ratified the Kyoto Protocol through the ratification of Law No. 17 of 2004 on July 28, 2004. This is one of Indonesia's efforts to implement sustainable development and participate in efforts to reduce global GHG (Greenhouse Gas) emissions. In addition, Indonesia's commitment to reducing carbon emissions can also be seen from the existence of Presidential Regulation No. 61 Year 2011 and Presidential Regulation No. 71 Year 2011 (Jannah and Muid, 2014). Efforts to reduce GHG emissions (including carbon emissions) made by companies as business actors can be known from the disclosure of carbon emissions (Carbon Emission Disclosure).

Although, the Kyoto Protocol has been ratified by many countries in the world, the implementation and effects of the amendment have not shown a significant effect on carbon emissions. This failure can be seen when the United States did not want to ratify the Kyoto Protocol, which revealed that the Kyoto Protocol did not comply with any of these requirements (The Research Council of Norway). In addition to the US, Canada also officially withdrew from the Kyoto Protocol in 2011, believing that Kyoto was only a hindrance to moving forward because it required all the technology available to protect the earth and was very costly.

In addition, data predicting world carbon dioxide emissions from 1990 to 2030 show that the Kyoto Protocol has not reduced carbon emissions. In fact, it is very clear that China has a very significant increase in this regard. Zulaikha and Prafitri (2016), revealed that the disclosure of greenhouse gas emissions in Indonesia is still a voluntary disclosure and the practice is still rarely carried out by business entities.

Companies that disclose carbon emissions in their reports have many consequences and considerations to avoid threats to the company such as increased operating costs, redused demand, reputational risk, legal proceedings, and penalties (Berthelot and Robert, 2011). On the other hand, this information is very useful for investors because they can find out how much carbon gas is emitted and how company managers use, receive, and process greenhouse gas emissions strategically in planning to control risks and financial impacts.

The form of disclosure is presented in the most widely used sustainability report by global companies, the GRI (global reporting initiative). GRI reflects a company's commitment to transparency and social responsibility, which can influence stakeholders'

perceptions of the integrity of the company's financial statements. GRI provides a reporting framework that covers a range of sustainability indicators, including carbon emissions. Companies that adopt GRI standards are typically more transparent in reporting their environmental impacts, including carbon emissions. Therefore, the use of GRI can be an important indicator in assessing the extent to which companies disclose information related to carbon emissions. Andrieta (2022) explained that companies that have sustainability reports with GRI standards can produce good quality reports so that the information can be conveyed well to stakeholders.

In addition to the disclosure of sustainability reports, the reputation of external auditors can affect the confidence of investors and users of financial statements, as credible auditors tend to reduce the risk of financial statement manipulation and improve audit quality. Reputable external auditors tend to be more thorough and independent in the audit process, including in verifying environmental information such as carbon emissions. A good auditor reputation can give stakeholders more confidence that the disclosed carbon emission reports are accurate and reliable.

Leverage or the ratio of debt to equity is an indicator of the company's level of financial risk. Leverage is used to determine the percentage of assets that will be used as debt collateral. Companies that have large amounts of debt prefer to pay off their debts to creditors rather than disclose their carbon emissions (Yudhiunahar, 2023). Therefore, leverage is often used to assess the potential risk of manipulation or distortion in financial statements. Leverage can influence management decisions regarding carbon emissions disclosure. Companies with high leverage may feel compelled to disclose more positive information or avoid disclosing environmental risks that may affect the perception of creditors and investors. Therefore, leverage may be a factor influencing the level of corporate disclosure of carbon emissions.

The issue of climate change and its impact on the environment has become an increasing global concern. Companies, especially in the manufacturing sector which tend to have a significant carbon footprint, are expected to be transparent in their carbon emissions disclosure. This research is important to understand the extent to which companies in Indonesia meet these expectations. Indonesia has adopted various regulations and policies related to the environment and reducing carbon emissions. In addition, international standards such as GRI are increasingly being adopted by companies in various countries. This research is important to evaluate the extent to which manufacturing companies in Indonesia comply with these regulations and standards, as well as what factors influence their compliance.

Research related to the carbon emissions disclosure has been widely carried out and is the hottest issue in the scope of economics and accounting. This is proven by research conducted by Ramadhan, et al (2021), Nastiti & Hardiningsih (2022), and Wirawan & Setijaningsih (2022). Luo et al (2013) and Choi et al (2013) investigated the factors that influence carbon emission disclosure. The basis for measuring carbon emissions is the information request sheet in the CDP (Carbon Disclosure Project) report. In addition, Lorenzo et al (2009) investigated the phenomenon of carbon emissions and used the global reporting initiative to measure carbon emissions. In Indonesia, research related to factors affecting carbon disclosure has been conducted (Jannah and Muid, 2014; Irwhantoko and Basuki, 2016) using different variables.

From some previous studies, it can be seen that there are several variables that after being studied have different results and this is what underlies the researchers to conduct a re-study to re-examine the factors that influence carbon emission disclosure in terms of some of the same factors and some different additional factors, namely profitability, environmental management systems and environmental costs. This study is a replication of research by Choi et al (2013) which has a topic regarding the analysis of carbon emission disclosure in the 100 largest companies in Australia listed on the Australian Securities Exchange in June 2009 based on the annual report and

sustainability report published. The difference between this research and previous research lies in the independent variables and samples used.

Legitimacy theory is used in this study to support the assumption that the company's actions to carry out social responsibility are accepted in the surrounding environment, where the company operates. The conformity of the company's actions to the norms or regulations prevailing in Indonesian society will encourage the company to gain legitimacy in society (Asmaranti and Lindriasari, 2014). Stakeholder theory proposes moral responsibility and transparency in dealing with all stakeholders. Environmental social disclosure is a form of good communication between the company and its stakeholders as a form of corporate support. With this disclosure, the company tries to show its social responsibility to stakeholders (Lu and Abeysekara, 2014).

This study was conducted to examine what factors influence the company's decision to disclose carbon emissions in manufacturing companies in Indonesia which include global reporting initiative (GRI), external auditor reputation, and leverage. The selection of this manufacturing company as the object of research is because manufacturing companies are companies that are directly related to the environment and nature. This research has far-reaching implications and can influence various aspects, from corporate decision-making to public policy, as well as offer directions for future research.

2. RESEARCH METHOD

The type of research used is quantitative research. This research is to find out what factors influence the company's decision to disclose carbon emissions in manufacturing companies in Indonesia which include GRI, external auditor reputation, and leverage. The influence of GRI can evaluate whether companies that adopt GRI standards are more likely to disclose information related to carbon emissions in a complete and transparent manner. Then, the influence of external auditor reputation can provide insight into whether reputable auditors are better able to encourage companies to make more accurate and transparent disclosures, which in turn can increase stakeholder confidence in carbon emissions reports. And the influence of leverage can provide insight into whether highly leveraged companies are more likely to hide or minimize environmental risk disclosures due to concerns about the negative impact on creditor and investor perceptions.

The population of this study are all manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2020-2022. The number of companies listed on the IDX is 154 companies with 3 sectors. The sampling method in this study used a nonprobability sampling method. The sampling technique used purposive sampling method. Based on predetermined criteria, namely manufacturing companies that list on the IDX, publish financial reports for 2 consecutive years namely 2020 to 2022, annual reports, the number of samples that meet these criteria is 63 companies.

The data source used in this study is secondary data obtained from the official IDX website, namely www.idx.co.id. The secondary data needed is the financial statements of manufacturing companies that have been in the annual report. The data analysis technique in this study used multiple regression analysis.

The following is the multiple regression equation in the study:

$$Y = a + b1X1 + b2X2 + b3X3 + e \quad (1)$$

The following is the research framework developed by the researcher.

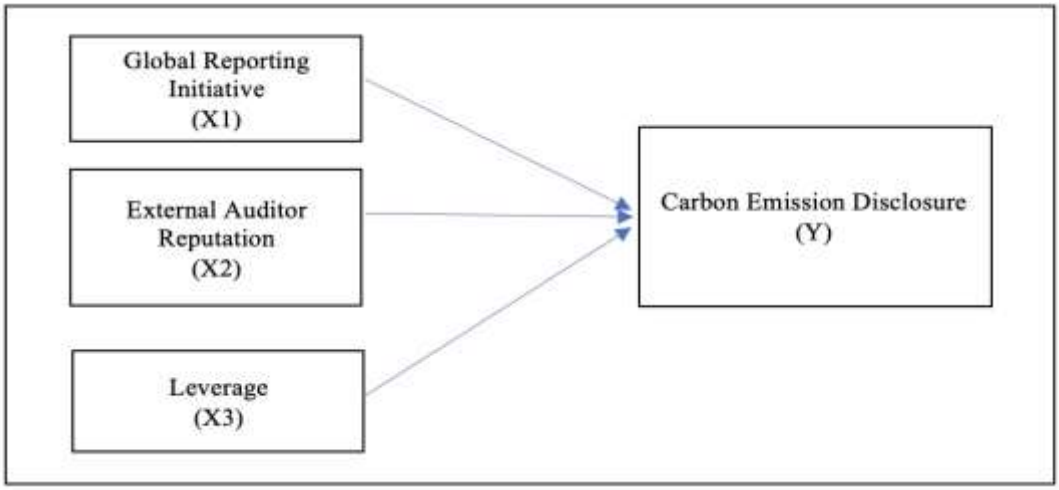

Figure 2. Framework

3. RESULTS AND DISCUSSIONS

3.1 Descriptive Statistics Test

Descriptive statistical tests are methods used to describe and summarize data in a way that is easy to understand. Descriptive statistics provide an overview of the data through various measures and visualizations. Descriptive statistical tests in this study include mean (average), standard deviation, minimum, and maximum. The results of descriptive statistical testing are presented in the following table.

Table 1. Descriptive Statistics Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
Carbon Emission Disclosure	63	.11	.94	.6176	.28152
Global Reporting Initiative	63	.00	1.00	.9841	.12599
Reputasi Auditor External	63	.00	1.00	.5238	.50344
Leverage	63	.27	1.85	.7351	.23930
Valid N (listwise)	63				

From the test results, it shows that the profitability variable proxied by the global reporting initiative has a minimum value of 0.11 and a maximum of 0.94. The average profitability of manufacturing companies owned by 63 companies shows a positive result of 0.62 with a standard deviation value of 0.28. The environmental management system variable proxied by external auditor reputation has a minimum value of 0.00 and a maximum of 1.00. The average environmental management system shows a positive result of 0.52 with a standard deviation value of 0.50. The environmental cost variable proxied by leverage has a minimum value of 0.27 and a maximum of 1.85. The average environmental cost shows a positive result of 0.73 with a standard deviation value of 0.23.

3.2 Classical Assumption Test

a. The normality test

The normality test aims to determine whether the distribution of data in the variables to be used in the study follows a normal distribution or not. To determine whether the data is normally distributed or not, this study uses the P- P Plot graph.

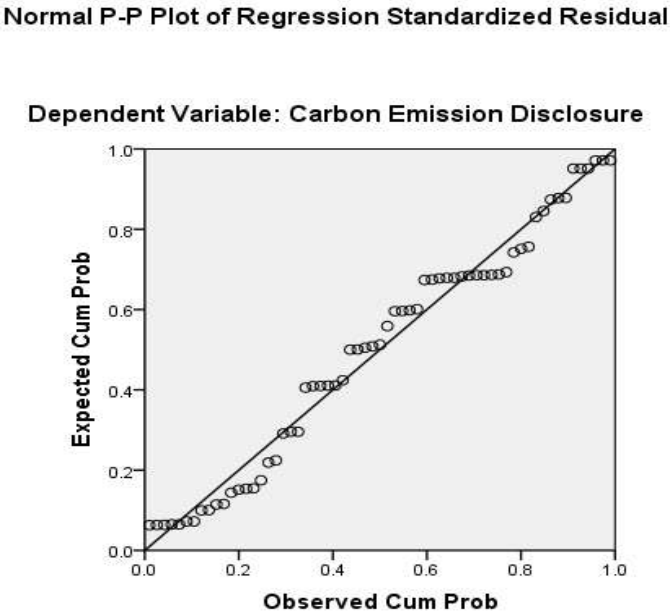

Figure 3. Normality Test Results

In the P-P Plot graph, it can be seen that the data is spread around the diagonal line and follows the direction of the histogram line towards the normal distribution pattern so that the regression model fulfills the normality assumption.

b. Audtocorrelation Test

The autocorrelation test aims to determine whether there is a correlation between residual values or errors in a regression model at different time periods. If the value du < d < 4-du then there is no autocorrelation or the value of the Durbin- Watson statistic is close to 2 or more indicating the absence of autocorrelation in the model.

Table 2. Autocorrelation Test Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.614[a]	.377	.345	.22785	2.273

a. Predictors: (Constant), Leverage, Global Reporting Inititativ, Reputasi Auditor External
b. Dependent Variable: Carbon Emission Disclosure

Based on the test results, it shows that the dw value is 2.273 which indicates that there is no positive or negative autocorrelation in the residuals of the regression model. The results of this test indicate that the residuals or errors in the regression model do not have a correlation with each other in different time periods.

c. Multicollinearity Test

The multicollinearity test aims to detect a very strong relationship or high correlation between two or more independent variables in a regression model.

Table 3. Multicollinearity Test Results

Model		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	VIF
1	(Constant)		.528	.599		
	Global Reporting Inititativ	.154	1.489	.142	.982	1.018
	Reputasi Auditor External	.572	5.497	.000	.977	1.024
	Leverage	-.022	-.215	.831	.994	1.006

Based on the test results, the Tolerance value of each variable is greater than the value of 0.10 and the VIF value is less than 10, which indicates that there is no multicollinearity between independent variables. This indicates that the independent variables in the model do not have a very strong relationship or high correlation with each other.

3.3 Multiple Regression Equation Analysis

Multiple regression equation analysis is used to predict the magnitude of the relationship between the dependent variable, namely carbon emission disclosure with the independent variables, namely global reporting initiative, external auditor reputation, and leverage. Based on the research results on the regression coefficient, the multiple regression equation in this study is

$$Y = 0{,}130 + 0{,}345\ (X1) + 0{,}320\ (X2) - 0{,}26\ (X3) \quad (2)$$

From the results of the multiple linear regression equation above, it can be concluded that: (a) The constant value of 0.130, means that if the Global Reporting Initiative (X1), External Auditor Reputation (X2), and Leverage (X3) are zero, then the value of Carbon Emission Disclosure (Y) is 0.130.(b) The regression coefficient of the global reporting initiative variable shows a positive value of 0.345. This shows that the global reporting initiative has a positive effect on increasing carbon emission disclosure, meaning that the higher the level of global reporting initiative, the higher the company discloses carbon emissions. If the global reporting initiative increases by one unit, the carbon emission disclosure will increase by 0.345 units, assuming other factors remain constant. (b) The regression coefficient of the external auditor reputation variable shows a positive value of 0.320. This shows that the reputation of the external auditor has a positive effect on increasing carbon emission disclosure, meaning that the higher the level of external auditor reputation, the higher the company discloses carbon emissions. If the reputation of the external auditor increases by one unit, the carbon emission disclosure will increase by 0.300 units, assuming other factors remain constant. (d) The regression coefficient of the leverage variable shows a negative value of 0.26. This shows that leverage has a negative effect on carbon emission disclosure, meaning that the higher the level of leverage, the higher the company discloses carbon emissions. If leverage increases by one unit, carbon emission disclosure will increase by 0.385 units, assuming other factors remain constant.

3.4 Hypothesis Testing

Hypothesis testing is conducted to determine the effect of each independent variable, namely global reporting initiative (X1), external auditor reputation (X2), and leverage (X3) on the dependent variable, namely carbon emission disclosure. Then, from each of these variables which is the most dominant influence on carbon emission disclosure. The following are the results of data analysis to test the influence of each variable.

a. Effect of Global Reporting Initiative on Carbon Emission Disclosure

The results showed that the global reporting initiative has no significant effect on carbon emission disclosure. The significance value of 0, 142 is greater than the probability value of 0.05. This indicates that the relationship between global reporting initiative and carbon emission disclosure is not strong enough and reliable. Companies may have a low level of awareness or interest in the issue of carbon emissions and therefore have little incentive to disclose, despite following the GRI.

b. The Effect of External Auditor Reputation on Carbon Emission Disclosure

The results showed that the reputation of the external auditor has a positive and significant effect on carbon emission disclosure. The significance value of 0.000 is smaller than the probability value of 0.05. This shows that a good external auditor reputation can increase trust and transparency in the company's financial and sustainability reports. Auditors with high reputations tend to have more stringent and independent standards, encouraging companies to make more comprehensive and accurate disclosures of carbon emissions. The significance value of this analysis suggests that the role of external auditors with a good reputation is an important factor in encouraging companies to increase transparency regarding carbon emissions.

c. The Effect of Leverage on Carbon Emission Disclosure

The results showed that leverage has no significant effect on carbon emission disclosure. The significance value of 0.831 is greater than the probability value of 0.05. This means that the level of leverage or the ratio of debt to equity of the company, does not determine the extent to which the company discloses information related to its carbon emissions. Other factors may play a greater role in encouraging or inhibiting the disclosure of corporate carbon emissions.

d. The Effect of Global Reporting Initiative, External Auditor Reputation, and Leverage simultaneously on Carbon Emission Disclosure

Based on the test results show that the significance value of 0.000 is smaller than the probability value of 0.05. It can be concluded that the global reporting initiative, external auditor reputation, and leverage simultaneously affect carbon emission disclosure.

The significance value of this simultaneous analysis indicates that the three variables together contribute to increased transparency and disclosure of corporate carbon emissions. This means that when the three factors are considered together, they collectively influence the extent to which companies disclose their carbon emissions. The GRI provides guidelines that assist companies in reporting carbon emissions transparently. A good external auditor reputation increases trust and accuracy in reporting, encouraging more detailed disclosure. Leverage, while it may not have a significant effect individually, can play a role in this context when combined with other factors.

4. CONCLUSION

This study focuses on carbon emission disclosure by manufacturing companies in Indonesia for the period 2020-2022. The research results show that hypothesis 1 is rejected, meaning the global reporting initiative does not have a significant effect on

carbon emission disclosure. Then, hypothesis 2 is accepted which shows that the external auditor's reputation has a positive and significant effect on carbon emission disclosure. And hypothesis 3 is rejected, indicating that leverage does not have a significant effect on carbon emission disclosure.

This study only focuses on manufacturing companies listed on the IDX. The variables used in this study do not include all factors that could affect carbon emissions disclosure, such as regulatory pressure, public perception, or the adoption of environmentally friendly technology. Furthermore, this study did not consider contextual factors, such as corporate culture, management leadership, or pressure from environmental groups that could influence carbon emission disclosure decisions. With these limitations, it is expected that future researchers can use all industrial sectors in Indonesia or in other countries. Then, use variables that include all factors that can affect the disclosure of carbon emissions.

The results of this study indicate the importance of transparency in carbon emissions disclosure. Companies are expected to be more proactive in disclosing information related to their environmental impacts, especially carbon emissions, as this can affect market perceptions and company competitiveness. Investors can use carbon emission disclosure information as one of the factors in making their investment decisions. This research opens up opportunities for further studies on other factors that influence carbon emissions disclosure, such as pressure from stakeholders, the influence of corporate culture, or the role of technology in emissions management.

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