



# The Moderating Role of Environmental Performance in the Effect of Profitability, Liquidity and Growth Opportunities for Disclosure on Carbon Emissions

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## Abstract

This study aims to examine the effect of profitability, liquidity, and growth opportunity on carbon emission disclosures with environmental performance as a moderating variable. The population of this study is high-profile industrial companies listed on the Indonesia Stock Exchange (IDX), with the sample in this study being 123 high-profile industrial companies listed on the Indonesia Stock Exchange (IDX) in 2019-2021. Determination of the number of samples used purposive sampling method. The hypothesis was tested using the SPSS 26 program with Multiple Regression Analysis (Multiple Linear Regression) and Moderated Regression Analysis (MRA). The results of this study indicate that profitability and liquidity have a significant effect on carbon emission disclosures. Growth Opportunity do not have a significant effect on carbon emission disclosures. Environmental performance has a significant effect on carbon emission disclosures.

**Keywords:** carbon emission disclosure; environmental performance; growth opportunity; liquidity; profitability

## INTRODUCTION

Climate change, which is referred to as the phenomenon of global warming, has become the biggest problem in recent years. This is due to the large amount of carbon dioxide (CO<sub>2</sub>) which causes the greenhouse effect. Based on data from the United States Aeronautics and

Space Administration (NASA) the concentration of carbon dioxide (CO<sub>2</sub>) in the Earth's atmosphere reached an average of 417.6 parts per million (ppm) on May 17 2022. The problem of climate change cannot be ignored because it is not only become a national but also a global problem.

According to the New Mexico Energy Association, United States of America (US), the greenhouse effect is an event where heat on the earth is trapped because it is blocked by gases in the atmosphere. The greenhouse effect in the earth's atmosphere is caused by a number of greenhouse gases (GHG). The United Nations Framework Convention on Climate Change (UNFCCC) stipulates that there are six types of gases that are classified as GHGs, including carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydro fluorocarbon (HFC), per fluorocarbon (PFC), and sulfur hexa fluoride (SF<sub>6</sub>).

According to the Carbon Disclosure Project (CPD) that greenhouse gases (GHG) are the responsibility of 50 of the 500 largest companies registered in the world because most activities in industrial companies increase carbon emission levels which then become a very high source of hazardous energy, especially to the environment. Companies in Indonesia, especially those in high profile industries, really need energy to support their operational activities and this energy source is obtained from fossil fuels, which of course will cause a high level of carbon emission. According to the 2017 National Greenhouse Gas Inventory and MRV Report it states that every year the

level of carbon emission in Indonesia has increased and contributes to the largest greenhouse gas emissions that come from burning fossil fuels carried out by high profile industrial companies.

One of the efforts to reduce carbon levels in the world, the United Nations drafted an amendment called the Kyoto Protocol which is a UN framework convention related to climate change (UNFCCC). Hundreds of countries in the world, one of which is Indonesia, have ratified the Kyoto Protocol to reduce greenhouse gases. Indonesia's efforts to reduce environmental pollution by ratifying the Kyoto Protocol, namely through Law no. 17 of 2004 in the context of implementing sustainable development and participating in efforts to reduce carbon emissions. Article 4 Presidential Decree No. 61 of 2011, states that business actors also take part in efforts to reduce GHG emissions. Efforts to reduce GHG emissions (including carbon emissions) carried out by companies as business actors can be seen from the disclosure of carbon emissions (Carbon Emission Disclosure) (Apriliana et al., 2019).

The company's obligation to measure, record, present and disclose carbon information is an implication of the Kyoto Protocol which causes

carbon accounting (Ratnatunga, 2016). Warren (2008) defines carbon accounting as the process of measuring carbon emissions produced by companies and determining emission reduction targets. The main purpose of implementing carbon accounting is to reduce carbon emissions produced by industry as part of the agreement in the Kyoto Protocol. Through carbon accounting, each industry can measure the carbon emissions they produce, create strategies to reduce them, record them and report them to company stakeholders (Shodiq, M.J. and Kartikasari, L., 2009).

In Indonesia, there are still few companies that disclose emissions. Whereas in the Requirements for Financial Accounting Standards (PSAK) it is stated that the company's obligation to report disclosure of its emissions is (1) PSAK 57 related to companies that are required to make reserves if there are constructive obligations, for example the company's commitment to environmental sustainability, (2) PSAK 48 related to the decline in the value of their assets, for example new technology to process obsolete company waste, (3) PSAK 60 related to environmental risks must be managed properly and reported by companies, especially related to financial

instruments, climate change is a business risk that companies must consider, (4) PSAK 71 applies in Indonesia in 2020 requires companies to model expected credit loss taking into account the possibility of default throughout the life of financial instruments, and (5) PSAK 19 related to intangible assets in new product development and must include SDGs elements in their considerations (Wiratno, A., & Muaziz, F. 2020).

Research conducted by Zanra et al., (2020) shows that good corporate governance, company size, and profitability have a positive effect, while leverage has a negative effect on carbon emission disclosure, and environmental performance can moderate the dependent and independent variables. Meanwhile, research conducted by Wardhani & Kawedar (2019) shows the results that liquidity, financial performance, and KAP reputation encourage companies to disclose carbon information that reflects and increases company value. It can be interpreted that companies that disclose carbon information have a high level of responsibility. Meanwhile, research conducted by Puspita Rini et al., (2021) shows the results that environmental performance and firm size have a significant and positive effect, profitability has a significant and

negative effect. While growth does not affect carbon emission disclosure.

This study aims to examine and analyze the factors that influence carbon emission disclosure in companies in Indonesia which include profitability, liquidity, and growth opportunities with environmental performance as a moderating variable. Reporting of social and environmental responsibility reports in the company's annual report basically aims to provide benefits for investors in order to be able to make investment decisions. Disclosure of carbon emissions is expected to be a positive signal about the company's commitment to responding to environmental issues so that company size, profitability and liquidity followed by disclosure of carbon emissions are expected to increase the positive influence on company value (Hapsoro & Falih, 2020). While the companies used as samples are high profile industrial companies listed on the Indonesia Stock Exchange in 2019-2021. The selection of objects is based on the fact that high profile industrial companies are companies that produce greater carbon emissions and companies that are vulnerable to environmental damage and other social consequences. The selection for the 2019-2021 period was due to the fact that during that period several

different conditions occurred, namely in 2019 everything was still running normally, but in 2020 to 2021 there were differences caused by non-natural disasters, namely the Covid-19 pandemic. During the Covid-19 pandemic, many people were active at home because of the Large-Scale Social Restrictions (PSBB) policy. The concentration levels of carbon monoxide (CO) in the three research periods, namely before the implementation of the PSBB, during the total PSBB, and during the transitional PSBB showed changes in the value of carbon monoxide (CO) emissions in the air and tended to decrease (Indriyaningtyas et al., 2021). The existence of these conditions has an impact on all activities including company activities. So the researchers wanted to see the effect of the differences in these two conditions.

Based on the background description above, the researcher is interested in conducting research as a final assignment with the title "The Influence of Profitability, Liquidity, and Growth Opportunity on Carbon Emission Disclosure with Environmental Performance as a Moderating Variable (Empirical Study of High-Profile Industrial Companies Listed on the Indonesia Stock Exchange in 2019-2021).

## **LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **Legitimacy Theory**

Legitimacy theory is charged with the relationship between companies and society through various rules and policies issued by the government. The legitimacy obtained from the community can be a strategic factor in developing the company in the future (Dewi & Aldhani, 2021). Companies that have legitimacy are seen as companies that can be trusted and deserve more support (Hrasky, 2013). Therefore, companies always try to gain legitimacy from the community, one of which is by disclosing carbon emissions.

Legitimacy is important because the legitimacy obtained from the community can be a strategic factor in the future development of the company (Dewi & Aldhani, 2021). Companies that have legitimacy are seen as companies that can be trusted and deserve more support compared to companies that do not have legitimacy (Hrasky, 2013). Therefore, companies always try to gain legitimacy from the community, one of which is by disclosing carbon emissions. Carrying out social and environmental disclosures makes the existence of organizations and activities carried out on a par with the

norms and rules that exist among the community, so that organizations can be seen as legitimate in the local community (Amaliyah & Solikhah, 2019). Thus, the legitimacy theory is used to explain the motivation for environmental disclosure by an organization that has the benefit of supporting the survival of a company.

### **Stakeholder Theory**

Stakeholder theory states that in carrying out its operational activities, companies do not only fulfill their own interests but must provide benefits to all company stakeholders, because support from stakeholders can affect the company's existence (Chariri, 2011). The stronger the stakeholder position, the stronger the company's tendency to adapt itself according to the wishes of its stakeholders (Maerissa, 2019). Each stakeholder certainly has different desires for the company, to realize this desire stakeholders will put pressure on the company to make environmental disclosures (Ghomi and Leung, 2013). To meet the needs of stakeholders, companies need to disclose non-financial activities such as the impact of company activities on the environment around the company (Amaliyah & Solikhah, 2019). Thus, stakeholders will be considered more capable of controlling the company's

operations, including in the company's disclosure activities. One form of disclosure that companies can do is disclosure of carbon emissions. Companies that make these disclosures are considered serious in responding to environmental issues (Trufvisa & Ardiyanto, 2019).

### **Theory of Constraint**

The theory of constraint emphasizes the identification and management of constraints (constraints) owned by the company. A constraint can be identified as anything that hinders system performance in an effort to achieve higher performance relative to its goals. Luo, et al., (2013) state that internal constraints within a company, for example a lack of financial resources will tend to prevent companies from disclosing carbon emissions, even though they are under the same external pressure.

### **Carbon Emissions Disclosure.**

Carbon emission disclosure is part of carbon accounting, where companies must measure, recognize, record, present and disclose carbon emissions. Disclosure of carbon emissions is a disclosure made by companies related to the environment (Dewi & Aldhani, 2021). Disclosures are made to assist internal or external

parties in making decisions (Pratiwi and Sari, 2012). Companies are required to be more transparent regarding all operational activities of the company and their responsibilities. Disclosure of carbon emissions uses an index reference developed by (Choi et al., 2013). Assessment of carbon emission disclosure is carried out by giving a score for each disclosure, the minimum score is zero and the maximum is eighteen, after being given a score then the total disclosure items are divided by eighteen so as to provide a carbon emission disclosure number.

### **The Effect of Profitability on Carbon Emission Disclosure**

Profitability is the company's ability to earn profits or profits in a certain period of managing assets at the asset level. Measuring profitability can use Return On Assets (ROA) by comparing net income with total assets. Profitability is used as a reference for demands that companies make voluntary disclosures (Wiratno, A., & Muaziz, F. (2020). Profitable companies are more able to finance emission prevention and reporting actions. The role of legitimacy theory in the relationship between profitability and carbon emission disclosure is when a company has

high profits, the company's responsibility increases because the company is considered more capable of implementing carbon emission reduction policies. From the arguments presented, the research hypothesis is as follows:

H<sub>1</sub>: Profitability has a positive effect on carbon emission disclosure

### **The Effect of Liquidity on Carbon Emission Disclosure**

Liquidity is the company's ability to meet its short-term obligations. Measuring liquidity can use the Current Ratio by comparing the company's current assets to its current debt. Companies that have high liquidity will create a good outlook for their stakeholders. Stakeholders will increasingly take sides and provide support to companies that have a good reputation. Companies can make additional reports, such as through carbon emission disclosures in forming and strengthening their reputation. This is in line with stakeholder theory that stakeholders will pay attention to companies and side with companies that carry out their social responsibility. Companies with conditions like this tend to disclose more extensive information to outsiders because they want to show that the company is credible, one of

which is by carrying out a carbon emission disclosure document. From the arguments presented, the research hypothesis is as follows:

H<sub>2</sub>: Liquidity has a positive effect on carbon emission disclosure

### **The Effect of Growth Opportunity on Carbon Emission Disclosure**

Growth opportunity is a company's growth opportunity in the future (Mai, 2006). Measuring growth opportunity can use the level of income growth for three years by comparing the current year's income with the income of the previous three years. The company's growth opportunity is related to disclosure behavior due to high expectations from stakeholders who demand companies to continue to develop their economic activities. In line with the theory of constraint, companies that are growing tend to allocate their resources to increase their economic expansion so that it becomes an internal obstacle for companies to disclose carbon emissions. According to Luo et al., (2013) growth opportunity as a projection of limited company resources has a negative effect on disclosure of carbon emissions. This is in accordance with the idea that internal constraints hinder actions to reduce and disclose carbon emissions. From the

arguments presented, the research hypothesis is as follows:

H<sub>3</sub>: Growth opportunity has a negative effect on carbon emission disclosure

**Environmental Performance Moderates the Effect Profitability on Carbon Emission Disclosure**

Environmental performance is the company's ability to preserve the environment in which the company operates. Environmental performance is measured in the form of a rating using the PROPER classification. By utilizing the PROPER classification, it can be assessed that companies with a high PROPER level have good environmental performance. With this assessment, the company will try to communicate its environmental performance in the form of environmental disclosure, namely carbon emission disclosure. Companies with high profitability will make environmental disclosures, namely carbon emissions in order to gain legitimacy from the community, because if they are not aligned with the values held by the community, the company will lose legitimacy. Therefore, companies need to disclose environmental performance so that company profits increase and can

encourage companies to carry out carbon disclosure emissions. From the arguments presented, the research hypothesis is as follows:

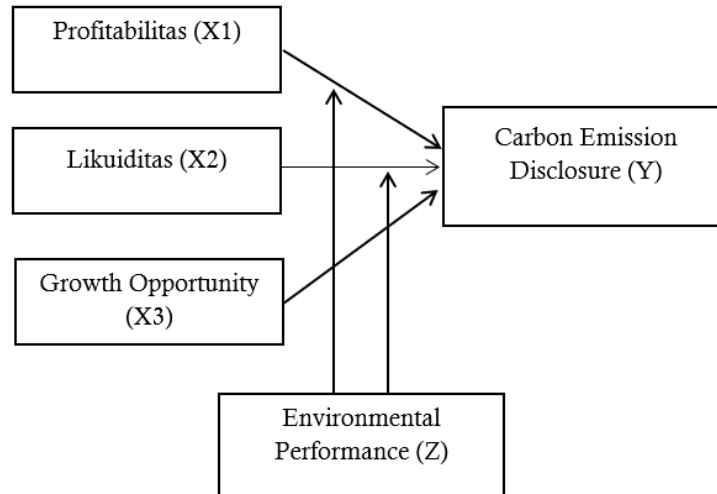
H<sub>4</sub>: Environmental performance moderates profitability on carbon emission disclosure.

**Environmental Performance moderates the Effect of Liquidity on Carbon Emission Disclosures**

Environmental performance is made in the form of a rating by an institution related to the environment. According to the Ministry of Environment, PROPER is a Company Performance Rating Assessment Program in environmental management. By utilizing the PROPER classification, it can be assessed that companies with a high PROPER level have good environmental performance. With this assessment, the company will try to communicate its environmental performance in the form of environmental disclosure, in this case the disclosure of greenhouse gas emissions. From the arguments presented, the research hypothesis is as follows:

H<sub>5</sub>: Environmental performance moderates liquidity on carbon emission disclosure.





**Figure 1. Research Model**

## **METHOD**

This type of research is associative research. The population in this study uses high profile industrial companies listed on the IDX in 2019-2021. Sampling used a purposive sampling method with several criteria 1) High profile industrial companies listed on the IDX in 2019-2021. 2) Companies that publish audited annual reports or sustainability reports for the 2019-2021 period. 3) Companies that have never suffered a loss in 2019-2021. 4) Companies that disclose PROPER or explicitly disclose carbon emissions (at least one item of disclosure of carbon emissions).

The number of samples in this study were forty-one high profile industrial companies consisting of the basic materials, consumer cyclicals, consumer non-cyclicals, energy,

industrials, infrastructure, and transportation & logistics sectors for three years, namely one hundred twenty-three companies.

The type of data is secondary data. Data needed for financial reports, audited annual reports, and sustainability reports for high profile industrial companies listed on the IDX for 2019-2021. Data obtained through the IDX website (<https://www.idx.co.id/>) and company websites. Data analysis techniques with Multiple Regression Analysis (Multiple Linear Regression) and Moderated Regression Analysis (MRA) with the help of SPSS software version 26.

## **RESULTS AND DISCUSSION**

The objects used in this chapter's research are high profile industrial companies listed on the IDX

in 2019-2021 consisting of the basic materials, consumer cyclicals, consumer non-cyclicals, energy, industrials, infrastructure, and transportation & logistics sectors. Determination of the sample in this study using purposive sampling method. Based on data obtained from the website <https://www.idx.co.id/> the number of high-profile industrial companies listed on the IDX is 530 companies. Based on the criteria taken in the sample selection, a final sample of 41 companies was obtained with 3 years of observation, so that the sample data was 123 companies.

Table 1 shows the results of the descriptive analysis. the variables x1, x2, Y, and Z have a fairly good data

deviation because the standard deviation value is smaller than the average value. While the variable x3 has a data deviation that is not good because the standard deviation value is greater than the average value.

Table 2 shows the results of the classic assumption test, namely the normality test. The normality test uses the Kolmogorov Smirnov statistic by looking at the K-S test, if the probability value is significant > 0.05 then the data is normally distributed and if <0.05 then the data is not normally distributed. Based on Table 2 above, a significant value is 0.786 > 0.05. So these results indicate that in the normality test the data is normally distributed.

**Table 1. Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
X1	123	.00	42.00	8.6098	7.44007
X2	123	19.00	1033.00	255.4553	178.99209
X3	123	.00	2228.00	136.2520	195.16729
Y	123	6.00	83.00	31.2602	23.77209
Z	123	69.00	161.00	111.7967	15.24282
Valid N (listwise)	123				

**Table 2. Normality Test  
One-Sample Kolmogorov-Smirnov Test**

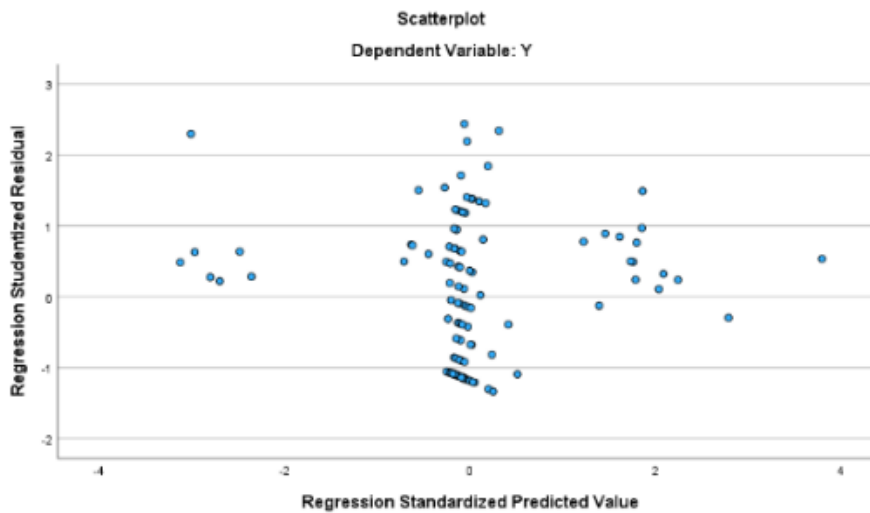
		Unstandardized Residual
N		123
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	23.62717000
Most Extreme Differences	Absolute	.166
	Positive	.166
	Negative	-.108
Test Statistic		.166
Asymp. Sig. (2-tailed) <sup>c</sup>		.735
	Sig.	.786
	99% Confidence Interval	Lower Bound .000
		Upper Bound .000

a. Test distribution is Normal

**Table 3. Multicollinearity Test**

Model	Coefficients <sup>a</sup>					Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Tolerance	VIF
	B	Std. Error	Beta				
1 (Constant)	-46.240	14.772		-	.002		
X1	.239	.263	.075	3.130	.908	.996	1.004
X2	.011	.011	.081	.990	.324	.995	1.005
X3	-.001	.010	-.006	-.067	.946	.995	1.005
Z	.686	.128	.440	5.350	<.001	.997	1.003

a. Dependent Variable: Y



**Figure 2. Scatterplot**

Source: data processed by researchers in 2022

Table 3 shows the results of the classic assumption test, namely the multicollinearity test. The multicollinearity test is carried out by looking at the tolerance value and VIF value which can be seen from the SPSS output. Based on Table 3 above, it can be seen that there is no multicollinearity in the data, because the tolerance value of all independent variables is greater than 0.10 and the VIF value is not more than 10.

Figure 2 shows the results of the classic assumption test, namely the heteroscedasticity test. The heteroscedasticity test is carried out by looking at the distribution of patterns in the output results. Based on the results of the test in Figure 2, it can be concluded that the data does not have heteroscedasticity because the distribution points in the data are spread out and do not form a pattern.

Hypothesis test is done with two models, namely multiple regression analysis and moderated regression analysis (MRA). This study uses multiple linear regression to see the effect of profitability, liquidity, and growth opportunity on carbon emission disclosure.

Based on Table 4 above it can be explained as follows: 1) The value of the constant  $\alpha$  is 29,277, this shows that if the independent variable has a value of 0, the carbon emission disclosure is 29,277. 2) The value of the regression coefficient ( $\beta_1$ ) is 0.175, meaning that if profitability increases by 1, carbon emission disclosure will increase by 0.175. Based on the test results, profitability has a t value of 0.600 and a significance of 0.001 < 0.05, so that there is a significant partial effect of profitability on carbon disclosure emission. The coefficient is positive, meaning that the higher the profitability, the higher the carbon emission disclosure will increase. So that H1 can be accepted. 3) The value of the regression coefficient ( $\beta_2$ ) is 0.013, meaning that if liquidity increases by 1, carbon emission disclosure will increase by 0.013. Based on the test results, liquidity has a t value of 1.056 and a significance of 0.003 < 0.05, so that there is a significant partial effect of

liquidity on carbon emission disclosure. The coefficient is positive, meaning that the increase in liquidity will increase carbon emission disclosure. So that H2 can be accepted. 4) The value of the regression coefficient ( $\beta_3$ ) is -0.002, meaning that if the growth opportunity increases by 1, carbon emission disclosure will decrease carbon emission disclosure by 0.002. Based on the test results, growth opportunity has a t value of -0.143 and a significance of 0.886 > 0.05, so there is no significant partial effect of growth opportunity on carbon emission disclosure. The coefficient is negative, meaning that the higher the growth opportunity, the lower the carbon emission disclosure. So that H3 is rejected.

Moderated Regression Analysis (MRA). In testing the hypothesis with moderating variables, using the MRA (Moderated Regression Analysis) test with two stages or two models. The moderating variable is an independent variable that functions to strengthen or weaken the relationship between the independent variables and the dependent variable.

**Table 4. Multiple Regression Analysis**

Model		Coefficients <sup>a</sup>					
		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	29.277	4.836			6.054	<.001
	X1	.175	.291	.055		.600	.001
	X2	.013	.012	.096		1.056	.003
	X3	-.002	.011	-.013		-.143	.886

a. Dependent Variable: Y

**Table 5. Moderated Regression Analysis (MRA) Model 1**

Model		Coefficients <sup>a</sup>					
		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	46.240	14.772			3.130	.002
	X1	.239	.263	.075		.908	.004
	X2	.011	.011	.081		.990	.003
	X3	-.001	.010	.006		-.067	.946
	Z	.686	.128	.440		5.350	<.001

a. Dependent Variable: Y

**Table 6. Moderated Regression Analysis (MRA) Model 2**

Model		Coefficients <sup>a</sup>					
		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	53.073	29.692			1.787	.038
	X1	2.333	2.289	.730		1.019	.016
	X2	.051	.097	.384		.526	.030
	X3	-.001	.010	-.005		-.055	.956
	Z	.748	.260	.480		2.883	.005
	X1_Z	.023	.020	.823		1.131	.013
	X2_Z	.001	.001	.476		.641	.026

a. Dependent Variable: Y

The first model tests whether the moderator variable is related or not to the dependent variable. Can be seen in the Table 5. The second model is to include variables in which there is a multiplication element as an independent variable with other independent variables. This aims to

determine whether it has a joint effect on the dependent variable. Can be seen in the Table 6.

Then performed the Simultaneous Significance Test (F Test). Simultaneous test or F test is conducted to test whether all the independent variables of profitability,

liquidity, growth opportunity, and environmental performance as moderators have a significant effect simultaneously (simultaneously) on the dependent variable of carbon emission disclosure. The results of the F test are seen in the sig column ANOVA table with a significance level of 0.05.

Based on the test results in Table 7 above, the significance value is 0.002 < 0.05. So there is a simultaneous or simultaneous influence of the profitability, liquidity, and growth opportunity variables on

the carbon disclosure emission variable. Then proceed with the calculation of simultaneous tests with the addition of a moderating variable, namely environmental performance.

Based on the test results in Table 8 above, the significance value is 0.001 < 0.05. So there is a simultaneous or simultaneous effect of profitability, liquidity, growth opportunity, moderation (profitability\*environmental performance), moderation (liquidity\*environmental performance) on carbon emission disclosure.

**Table 7. Simultaneous Test (Test F) Multiple Linear Regression ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14134.085	4	3533.521	7.607	.002 <sup>b</sup>
	Residual	54809.589	118	464.488		
	Total	68943.675	122			

a. Dependent Variable: Y

b. Predictors: (Constant), X3, X1, X2

**Table 8. Simultaneous Test (F Test) MRA Regression ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14871.303	6	2478.551	5.317	.001 <sup>b</sup>
	Residual	54072.372	116	466.141		
	Total	68943.675	122			

a. Dependent Variable: Y

b. Predictors: (Constant), X2\_Z, X1, X3, Z, X1\_Z, X2

**Table 9. Partial Test (T Test) Multiple Linear Regression Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.277	4.836		6.054	<,001
	X1	.175	.291	.055	.600	.001
	X2	.013	.012	.096	1.056	.003
	X3	-.002	.011	-.013	-.143	.886

a. Dependent Variable: Y

Source: data processed by researchers in 2022

**Table 10. Partial Test (T Test) MRA Regression**

		Coefficients <sup>a</sup>			t	Sig.
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	53.073	29.692		1.787	.038
	X1	2.333	2.289	.730	1.019	.016
	X2	.051	.097	.384	.526	.030
	X3	-.001	.010	-.005	-.055	.956
	Z	.748	.260	.480	2.883	.005
	X1_Z	.023	.020	.823	1.131	.013
	X2_Z	.001	.001	.476	.641	.026

a. Dependent Variable: Y

Then performed Partial Significance Test (T Test). T test or partial test to test how the effect of each independent variable partially or individually on the dependent variable. This test is carried out using a significance level of 0.05. Following are the results of the t test for the multiple linear regression model and the results of the moderation regression test.

Based on the results of the regression analysis carried out, the results obtained from the hypothesis testing of the 5 hypotheses are as follows: 1) Profitability affects carbon emission disclosure. Based on the results in Table 9, profitability has a t value of 0.600 and a significance of 0.001 <0.05, so that there is a significant partial effect of profitability on carbon emission disclosure. The regression coefficient of 0.175 means that there is a positive influence, meaning that the higher the profitability value, the carbon emission disclosure will also be

higher. This value also means that carbon emission disclosure will increase by 0.175 units for every 1 unit increase in profitability. H1 is accepted. 2) Liquidity affects carbon emission disclosure. Based on the results in Table 9, liquidity has a t count of 1.056 and a significance of 0.003 <0.05, so that there is a significant partial effect of liquidity on carbon disclosure emissions. The regression coefficient is 0.013 which means that there is a positive influence, meaning that the higher the liquidity value, the higher the carbon emission disclosure will be. This value also means that carbon emission disclosure will increase by 0.013 units for every 1 unit increase in liquidity. H2 is accepted. 3) Growth opportunity has no effect on carbon emission disclosure. Based on the results in Table 9, growth opportunity has a t value of -0.143 and a significance of 0.886 <0.05, so there is no significant partial effect of growth opportunity on carbon emission disclosure. The

regression coefficient is -0.002, which means that the higher the growth opportunity value, the lower the carbon disclosure emission. This value also means that carbon emission disclosure will decrease by 0.002 units for every 1 unit increase in growth opportunity. H3 is rejected, H3 is not supported statistically. 4) Environmental performance is able to moderate profitability on carbon emission disclosure. Based on the results in Table 10, profitability has a t value of 1.131 and a significance of 0.013 <0.05, so that there is a significant partial effect of profitability on carbon emission disclosure with environmental performance as moderation. The regression coefficient is 0.023 which means that there is a

positive influence, meaning that the higher the profitability value, the greater the effect of profitability on environmental performance by 0.023. H4 is accepted. 5) Environmental performance is able to moderate liquidity on carbon emission disclosure. Based on the results in Table 10, liquidity has a t value of 0.641 and a significance of 0.026 <0.05, so that there is a significant partial effect of liquidity on carbon emission disclosure with environmental performance as moderation. The regression coefficient is 0.001 which means there is a positive influence, meaning that the higher the liquidity value, the greater the effect of liquidity on environmental performance by 0.001. H5 is accepted.

**Table 11. Coefficient of Determination (R2 Test) Multiple Linear Regression**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.453 <sup>a</sup>	.205	.178	1.55198

a. Predictors: (Constant), X3, X1, X2

**Table 12. Coefficient of Determination (R2 Test) MRA Regression**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464 <sup>a</sup>	.216	.175	1.59030

a. Predictors: (Constant), X2\_Z, X1, X3, Z, X1\_Z, X2



Table 11 and table 12 are the test results determination coefficient test (R2 Test). Test the coefficient of determination (R2 test) to measure how far the model's ability to explain the dependent variable. The results of the coefficient of determination test (R2 test) for the multiple linear regression model can be seen in table 11. The results of the coefficient of determination test show that the adjusted R square value of multiple linear regression is 0.178 or 17.8%, meaning that the moderate variable with carbon emission disclosure is influenced by 17.8% of the variable profitability, liquidity, growth opportunity. While 82.2% is influenced by other variables.

The results of the test for the coefficient of determination (R2 test) for the MRA model can be seen in table 12. The results of the determination coefficient test show that the adjusted R square value of multiple linear regression is 0.175 or 17.5%, meaning that the moderate variable with carbon emission disclosure is influenced by 17.5% of the variables profitability, liquidity, growth opportunity, moderation (profitability\*environmental performance), and moderation (liquidity\*environmental performance). While 82.5% is influenced by other variables.

After doing some of the tests above it can be concluded as follows. Profitability has an effect on carbon emission disclosure. The results of this study can provide support for the legitimacy theory which explains that companies with high profitability can make voluntary environmental disclosures that can be used by companies to gain legitimacy from society where this can be a strategic factor in company development in the future. The results of this study are also in line with stakeholder theory which states that companies with high profitability can make environmental disclosures that can affect the company's relationship with stakeholders. The results of this test are in line with research conducted by (Dewi and Aldhani, 2021) which states that profitability has a positive effect on disclosure of carbon emissions. Profitability describes the company's ability to earn profits or gains in a certain period of asset management at the level of sales, assets, and share capital. Based on theory and logic, the higher the ROA value, the higher the company's net profit and profitability.

Liquidity has an effect on carbon emission disclosure. The results of this study can provide support for stakeholder theory which explains that with high liquidity will create a good view in the eyes of stakeholders

and to get support from stakeholders companies can make additional reports such as implementing more complete disclosure of information such as voluntary carbon emission disclosure. The results of this test are based on research conducted by (Wardhani and Kawedar, 2019) which states that liquidity as measured by current assets divided by short-term liabilities has a positive effect on disclosure of carbon information. Liquidity describes the company's ability to meet its short-term obligations. Based on theory and logic, the higher the CR value, the higher the company's current assets and liquidity. Liquidity encourages companies to disclose carbon information that reflects and enhances company value, which means that companies that disclose carbon information have a high level of responsibility.

Growth opportunity has no effect on carbon emission disclosure. The theory of constraint states that companies have constraints that can hinder company performance. There are four types of constraints, namely internal constraints, external constraints, physical constraints, and non-physical constraints (Gaspersz, 2002). There are internal constraints within a company, for example a lack of financial resources which will tend

to hinder companies from making and disclosing carbon emission reduction activities, even though they are under external pressure (Luo, et al., 2013). Although disclosure of carbon emissions is an action desired by companies, the decision to disclose this information is strongly influenced by the funds available to implement it (Bansal, 2005).

Growth opportunity describes the growth opportunities of a company in the future. Growth opportunities for high profile industrial companies do not influence companies to disclose carbon emissions. The results of this study are not in line with previous research conducted by Andiningtyas in 2018 and Luo., et al in 2013 which stated that growth opportunities have a negative effect on carbon disclosure emissions. This study used a sample of high-profile industrial companies listed on the Indonesia Stock Exchange in 2019-2021. A high-profile industrial company is a company that has a high level of sensitivity to the environment, a high level of political risk, or a strong level of competition (Robert, 1992 in Utomo, 2000). High profile industrial companies are industries that are very vulnerable to environmental damage and other social consequences. So it can be concluded that the high or low

growth opportunity of high profile industrial companies does not affect companies to carry out carbon emission disclosures because high profile industrial companies are companies that are vulnerable to environmental damage and other social consequences so that companies inevitably have to disclose carbon emission disclosures.

Environmental performance moderates the effect of profitability on carbon emission disclosure. The results of this study can provide support for legitimacy theory and stakeholder theory. Legitimacy theory explains that when a company's environmental performance is good, the company will voluntarily make environmental disclosures, one of which is disclosure of carbon emissions. Companies with good environmental performance will tend to have good strategies for dealing with environmental problems. With the disclosure of carbon emissions supported by good environmental performance, it is expected to be a positive signal about the company's commitment to responding to environmental issues so that with company size, profitability and liquidity followed by good environmental performance, it is expected to increase the positive influence on the disclosure of

company carbon emissions. The results of this study are in line with research from (Zanra et al., 2020) and (Efendy, 2022). The results of this study can also strengthen previous research which states that the effect of profitability on carbon emission disclosure is environmental performance as a moderating variable (Efendy, 2022).

It could be that some companies carry out more carbon emission disclosures to increase the trust of stakeholders who are starting to have doubts about the company's environmental performance, this happens because it gets a low PROPER rating. This means that the better the environmental performance of a company, the higher the level of carbon emission disclosure that will be made. Environmental performance can help companies to gain value and support from stakeholders by implementing an environmental management system where it will provide legitimacy to the company by reducing the environmental impact that will arise in society. Environmental performance can also assist companies in dealing with environmental impacts such as carbon emissions and can also be information for stakeholders.

Environmental performance moderates the effect of liquidity on

carbon emission disclosure. The results of this study can provide support for stakeholder theory. Environmental performance can help companies to gain value and support from stakeholders by implementing an environmental management system in a way that reduces the environmental impact that will arise in society. Environmental performance can also assist companies in dealing with environmental impacts such as carbon emissions and can also be information for stakeholders. The results of this study are in line with research from (Zanra et al., 2020) and (Wardhani & Kawedar, 2019).

The results of this study can also strengthen previous research which states that the effect of carbon emission disclosure on company value is environmental performance as a moderating variable (Rahmanita, 2020). It could be that some companies carry out more carbon emission disclosures to increase the trust of stakeholders who are starting to have doubts about the company's environmental performance, this happens because it gets a low PROPER rating. This means that the better the environmental performance of a company, the higher the level of carbon emission disclosure that will be made.

## **CONCLUSION, IMPLICATION AND LIMITATION**

Based on the results of the research and analysis conducted, it can be concluded that profitability (X1) and liquidity (X2) have an effect on disclosure of carbon emissions, while growth opportunities (X3) have no effect on disclosure of carbon emissions. Meanwhile, environmental performance is able to moderate the influence between profitability and liquidity on disclosure of carbon emissions.

Based on the results and discussions that have been carried out in this study, it is better for future researchers to change or add variables in this study because the independent variables in this study only contribute 17.8 per cent to the dependent variable and the remaining 82.2 per cent are influenced by other variables. In addition, future researchers can use other samples or expand the population in order to support hypothesis 3 in this study because this study used a sample of high-profile industrial companies which are industrial companies that are vulnerable to the environment and other social consequences that have an obligation to carry out carbon emissions. disclosure so that it is unable to support hypothesis 3.

This section presents the research conclusion, implications, limitations, and advice for future research. The implications are practical advice from result research. Research limitations include all aspects that can be considered by researchers to refine future research, while the research advice is a future direction for the next research based on the limitations highlighted.

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