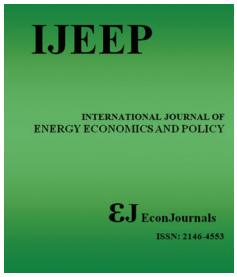

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Factor Affecting Intentions of Indonesian Companies to Disclose Carbon Emission

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ABSTRACT

This study aims to determine and analyze the effect of Firm Size, Profitability, Leverage, Institutional Ownership, Board Size, and Board Independence on Carbon Emission Disclosure. The population in this study are the companies involved in the CDP Project, totaling 84 companies. While the sample used in this study amounted to 19 companies. The method used in this study is panel data regression with the Eviews 10 application tool. The results in this study found that Board Size had a positive and significant effect on Carbon Emission Disclosure. Meanwhile, Firm Size, profitability, leverage, Institutional Ownership, and Board Independence were found to have no effect and not significant on Carbon Emission Disclosure.

Keywords: Firm Size, Profitability, Leverage, Institutional Ownership, Board Size, Board Independence, Carbon Emission Disclosure
JEL Classifications: O16, Q51, Q56

1. INTRODUCTION

In the twenty-first century, companies are facing new challenges related to carbon emission resulting in globalization. Therefore, the company's vision of its goal has shifted from initially shareholders to ways of maintaining sustainability of the company. Corporate sustainability can be maintained by building a good corporate reputation. A good reputation can be built through economic, social and environmental performance, and the transparent disclosure of the company's performance information (for example, carbon emission disclosure) to the public through annual reports, corporate social responsibility reports, or sustainability reports. The carbon emission challenges increase along with the increasing impact of carbon emission on the earth's surface and atmosphere, leading to the phenomenon of global warming and the loss of ecosystems (United Nations, 1992). Carbon emission challenges were born due to pressure to reduce carbon emission. Reducing business carbon emission can reduce the negative impacts of globalization. Therefore, companies have an important role in stabilizing climate change by reducing carbon emission.

The COVID-19 pandemic has sparked a global health crisis that has had a major impact on human life, including carbon emission. Carbon emission will decline as the lockdown is applied in an effort to prevent the spread of the corona virus. Liu et al. (2020) found that carbon emission had decreased by 7.1% as of 1 November 2020. This decrease could be due to restrictions in activities in response to pandemic, as well as changes in the global energy system.

The occurrence of climate change and global warming due to the operational activities of the company promote the rise of an international political commitment that creates ideas through the Earth Summit with the aim of achieving sustainable economic development by meeting the needs of the current generation without compromising the interests of the future generation.

According to the Handbook of Energy and Economic Statistics of Indonesia (ESDM, 2020), the top three causes of carbon emission in Indonesia come from fuel, industry, and transportation. Rising carbon emission remain a global concern, including Indonesia. Therefore, the Indonesian government seeks to reduce carbon

emission through commitments outlined by Peraturan Presiden No. 61 Tahun 2011 on the national action plan for the reduction of greenhouse gas emissions and Peraturan Presiden No. 71 Tahun 2011 on the implementation of national investments in greenhouse gases. In article 4 of Peraturan Presiden No. 61 Tahun 2011, it is stated that business actors are also involved in efforts to reduce greenhouse gas emission as reflected in the carbon emission disclosure. The implementation of carbon emission disclosure in Indonesia remains voluntary. Therefore, the disclosure of carbon emission by Indonesian companies is intended for the benefit of companies' stakeholders. However, many companies do not disclose their carbon emission. The reason of many companies that do not disclose carbon emission is the high cost required to disclose carbon emission. So, disclosure of carbon emission is considered detrimental to the company.

2. BACKGROUND

Several factors have been used in various studies related to factors affecting the disclosure of carbon emission. Several studies found a positive or negative relationship between various factors with the disclosure of carbon emission. The size of the company is one of the most common factors that has a positive relationship with carbon emission disclosures (Reverte, 2009; Gonzalez-Gonzalez and Ramírez, 2016; Kalu et al., 2016; Akbaş and Canikli, 2019; Nasih et al., 2019). Large companies will tend to increase social pressure so that the disclosure of carbon emission can be influenced by the amount of social pressure that the company received. However, several other studies found that there is no relationship between company size and the tendency to disclose carbon emission (Irwhantoko and Basuki, 2016; Kurnia et al., 2021). In addition to the size of the company, the profitability of the company is also widely used as one of the factors that affects the disclosure of carbon emission because companies that gain more profit will have more financial capacity to disclose carbon emission. Studies conducted by Akbaş and Canikli (2019); Saraswati et al., (2021); Andrian and Kevin, 2021) revealed that profitability affects the disclosure of carbon emission. Meanwhile, Irwhantoko and Basuki (2016) stated that there is no correlation between profitability and the disclosure of information related to carbon emission. Moreover, some studies also used leverage as one of the factors affecting the volume of carbon emission disclosure. Akbaş and Canikli (2019) in their study found that there is no relationship between leverage and the disclosure of carbon emission. Conversely, Abdullah et al., (2020) found that there is a positive relationship between debt levels and the disclosure of carbon emission. Another factor that was also widely used in earlier studied was institutional ownership. Many previous studied have revealed that institutional ownership does not affect the disclosure of carbon emission (Kalu et al., 2016; Akbaş and Canikli, 2019; Andrian and Kevin, 2021). Corporate governance is one of the factors that can affect the disclosure of carbon emission. Therefore, some studies also used corporate governance as of the factors that affect the disclosure of carbon emission. Governance in previous studies is divided into the board size, the independence of the board, and the diversity of the board (Yunus et al., 2016; Akbaş and Canikli, 2019; Kılıç and Kuzey, 2019; Saraswati et al., 2021). The board size and the independence of boards are two things in corporate governance that re often associated with the disclosure of carbon emission. Study conducted by Kılıç and Kuzey, (2019) concludes that board size and board independence affect the practice of disclosing information related to carbon emission. These results are supported by the finding Nasih et al., (2019). Addditionally, Saraswati et al., (2021) also found the relationship between board independence and carbon emission disclosure. Different findings from some previous studies motivated us to examine the factors influencing the involvement of Indonesian companies in CDP Projects.

3. METHODOLOGY

This study will utilize a quantitative approach that will be done by testing the hypotheses. Quantitative approach indicate that this study will use data in form of numbers and the data will be analyzed using statistics (Sugiyono, 2013).

The data is in form of annual reports of Indonesia companies that have carried out CDP Projects according to CDP Projects Data. The sampling process in this study will utilize in order to determine the sample of this study. Eighty-four companies that involve in CDP Projects must meets a number of criteria to be the sample. There are three criteria that the companies must meet to be the sample of this study such as:

1. Public company listed on the Indonesia Stock Exchange
2. Published annual reports which can be accessed on the company's official websites or the website of the Indonesia Stock Exchange
3. Published annual reports in 5 constructive years.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

Before measuring the overall effect of Firm Size, profitability, leverage, Institutional Ownership, Board Size, and Board Independence variables on Carbon Emission Disclosure, firstly we will review the description of research variables using descriptive statistical analysis. Descriptive statistics provide an overview of data that can be seen from the average value, standard deviation, maximum value, and minimum value. More details about the results of descriptive research statistics can be seen in Table 1.

Based on Table 1, it can be concluded that the results of descriptive statistical tests in this study are as follows:

1. Firm Size
   The minimum value of 8183318 achieved the maximum value of 3.61E+14, with a mean value of 6.49E+13. The mean value shows a result that is smaller than the standard deviation of 9.51E+13 < 6.49E+13. So the Firm Size in this study did not vary.
2. Profitability
   Minimum value of −28.60000, while the maximum value is 45,77668, with a mean value of 0.452632.The mean value shows that it is smaller than the standard deviation value of 0.452632 < 5.855542. So the profitability in this study is not varied.

Table 1: Descriptive test results

	X1	X2	X3	X4	X5a	X5b	Y
Mean	6.49E+13	0.334867	1.946730	0.452632	6.189474	0.684211	0.778947
Median	2.60E+13	0.035652	0.863108	0.000000	6.000000	0.000000	1.0000000
Maximum	3.61E+14	45,77668	24.84892	1.0000000	11.00000	3,000000	1.0000000
Minimum	8183318.	−28.60000	−15.81731	0.000000	2000000	0.000000	0.000000
Std. Dev.	9.51E+13	5.855542	4.487060	0.500392	2.059202	0.866187	0.417157
Skewness	1.894220	3.742614	1.031626	0.190330	−0.028432	1.050019	−71.344468
Kutosis	5.446624	45.61318	13.88365	1.036225	2.646339	3.160080	2.807593
Jarque-Beta	80.50557	7409.649	485.7306	15.83853	0.507892	17.55832	28.76677
Probability	0.000000	0.000000	0.000000	0.000364	0.775734	0.000154	0.00001
Sum	6.16E+15	31.81235	184.9393	43,000,000	588.0000	65000000	74,000000
SumSq. Dev.	8.49E+29	3223.013	1832,586	23.53684	398.5895	70.52632	16,35789
Observations	95	95	95	95	95	95	95

Source: Eviews 10 Data Processing

3. Leverage
   Minimum value of −15.81731, while the maximum value is 24.84892, with a mean value of 1.946730. The mean value shows results that are greater than the standard deviation of 7.858611 > 4.487060 So the leverage in this study is varied.
4. Institutional Ownership
   Minimum value of 0.000000, while the maximum value is 1.0000000, with a mean value of 0.566042. The mean value shows results that are greater than the standard deviation of 0.566042 > 0.500392. So the institutional ownership in this study varied.
5. Board Size
   Minimum value of 2000000,while the maximum value is 11.00000, with a mean value of 6.189474. The mean value shows that it is greater than the standard deviation value of 6.189474 > 2.059202. So the board size in this study varied.
6. Independence Board
   Minimum value of 0.000000, while the maximum value is 3,000000, withmean value of 0.684211. The mean value shows that it is smaller than the standard deviation of 0.684211 < 0.866187. So the board independence in this study is not varied.
7. Carbon Emission Disclosure
   Minimum value of 0.000000,while the maximum value is 1.0000000, with a mean value of 0.778947. The mean value shows that it is greater than the standard deviation of 0.778947 > 0.417157. So the carbon emission disclosures in this study are varied.

4.2. Classic Assumption Test

The data testing in this causal analysis was carried out with the classical assumption test consisting of normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test, where the statistical requirements that must be met in regression analysis using the Ordinary Least Squared approach in the estimation technique. Thus, whether or not the classical assumption test is necessary depends on the results of the selection of the regression model estimation.

4.2.1. Multicollinearity test

Multicollinearity is the condition of a linear relationship between the independent variables. Because it involves several independent variables, multicollinearity will not occur in a simple regression equation. The following are the results of the multicollinearity test:

Based on the results of Table 2, it can be seen that there are no independent variables that have a value of more than 0.8, so it can be concluded that there is no multicollinearity in the regression model.

4.2.2. Heteroscedasticity test

Heteroscedasticity test was conducted to determine whether or not there was a variance inequality from the residuals of the panel data regression model. The test is carried out by the Glejser test, which is the regression of each independent variable with the absolute residual as the dependent variable. Residual is the difference between the observed value and the predicted value, while absolute is the absolute value. This test was conducted to regress the absolute value of the residual on the independent variable. The confidence level of 5% is the basis for determining the presence or absence of heteroscedasticity. If the significance value is more than 5%, then there is no symptom of heteroscedasticity.

Based on the results of Table 3, it can be seen that the probability value for each variable is > (0.05), which means that the panel data regression model does not occur heteroscedasticity.

4.2.3. Autocorrelation test

This assumption autocorrelation test aims to determine whether in a linear regression model there is a correlation between the confounding error in period t and the confounding error in period t-1 (previous). To detect autocorrelation, statistical tests can be carried out through the Durbin-Watson test (DW test), this has a fundamental problem, namely not knowing exactly about the distribution of the statistics itself. The results of the DW test in this study are as follows:

From the output eviews in Table 4, the DW value is 1.107582 Then the value from the DW table is compared with the value 2, and because this value is between −2 and +2, the assumption of no autocorrelation is fulfilled.

4.3. Panel Data Regression Model Analysis

4.3.1. Model panel data regression model

4.3.1.1. Common effect model (CEM)

CEMs is the simplest model for estimating the panel data model. Following are the estimation results using CEM.

Based on Table 5, the regression equation obtained is:

Table 2: Multicollinearity test results

	X1	X2	X3	X4	X5a	X5b
X1	1.0000000	−0.025944	0.351149	0.021275	0.596378	−0.038144
X2	−0.025944	1.0000000	0.008223	0.048523	0.218195	0.058717
X3	0.351149	0.008223	1.0000000	0.005414	0.157410	−0.005245
X4	0.021275	0.048523	0.005414	1.0000000	0.019127	0.406918
X5a	0.596378	0.218195	0.157410	0.019127	1.0000000	−0.133099
X5b	−0.038144	0.058717	−0.005245	0.406918	−0.133099	1.0000000

Source: Eviews 10 Data Processing

Table 3: Heteroscedasticity test results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	1.0000000	1.13E-07	8845642.	0.0000
X1	−1.39E-27	1.92E-22	−7.24E-06	1.0000
X2	−8.03E-15	1.69E-09	−4.75E-06	1.0000
X3	−1.82E-14	8.42E-09	−2.17E-06	1.0000
X4	2.89E-14	1.44E-08	2.01E-06	1.0000
X5	1.69E-13	1.56E-08	1.09E-05	1.0000
X6	7.26E-14	1.03E-08	7.04E-06	1.0000

Source: Eviews 10 Data Processing

Table 4: Autocorrelation test results

Mean dependent var	0.313867
SD dependent var	0.292035
Sum squared resid	7.078017
Durbin-Watson stat	1.107582

Source: Eviews 10 Data Processing

Table 5: Common effect model test results

Dependent Variable: Y				
Method: Least Squares Panel				
Periods included: 5				
Cross-sections included: 19				
Total panel (balanced) observations: 95				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	0.160043	0.149365	1.071484	0.2869
X1	−8.72E-16	5.46E-16	−1.594935	0.1143
X2	0.005676	0.006925	0.819689	0.4146
X3	−0.006237	0.009203	−0.677696	0.4997
X4	0.166785	0.084599	1.971468	0.0518
X5a	0.102564	0.024825	4.131461	0.0001
X5b	−0.035959	0.049571	−0.725409	0.4701
R-squared	**0.248894**	**Mean dependent var**		**0.778947**
Adjusted R-squared	0.197682	SD dependent var		0.417157
SE of regression	0.373657	Akaike info criterion		0.939871
Sum squared resid	12.28652	Schwarz criterion		1.128052
Likelihood logs	−37.64389	Hannan-Quinn Criter		1.015910
F-statistics	4.860082	Durbin-Watson stat		0.661782
Prob (F-statistic)	0.000249			

Source: Eviews 10 Data Processing

Carbon Emission Disclosure = 0.160043−8.72E-16 X1 + 0.005676 X2 − 0.006237 X3 + 0.166785 X4 + 0.102564 X5a − 0.035959 X5b

4.3.1.2. Fixed effect model (FEM)

The FEM is a panel data regression model that can show differences in constants between objects in the same regression coefficient. Following are the estimation results using the FEM.

Based on Table 6, the regression equation obtained is:
Carbon Emission Disclosure = 0.297615+4.35E-15 X1 + 0.001955 X2 + 0.000790 X3 − 0.070333 X4 + 0.055016 X5a − 0.162978 X5b

4.3.1.3. Random effect model (REM)

In the random effects model, it is assumed that the difference between the intercepts and the constants is caused by the residual/error as a result of differences between samples and time periods that occur randomly. Following are the estimation results using the random effects model.

Based on Table 7, the regression equation obtained is:
Carbon Emission Disclosure = 0.317635+3.33E-17 X1 + 0.002483 X2 − 0.001279 X3 + 0.159327 X4 + 0.073477 X5a − 0.096599 X5b

4.4. Selection of Model Panel Data Regression Model

4.4.1. Chow test

The Chow test is used to select the model to use whether it is better to use the CEM or the FEM. This test can be seen in the Probability (Prob.) Cross-section F and Cross-section chi-square with the following hypotheses:

H0: The model follows the CEM if the Probability of Cross-section F and Cross-section Chi-square > (0.05)
Ha: The model follows the FEM if the Probability of Cross-section F and Cross-section Chi-square < (0.05)

Based on the test results in Table 8, it can be seen that the value of the Cross-section F probability shows the number 0.0000 and Cross-section Chi-square0.0000, where this number is smaller than the test significance level of 0.05, it can be concluded that the FEM is more feasible to use than the CEM.

4.4.2. Housman test

The Hausman test is used to select the model to use whether it is better to use the REM or the FEM. This test can be seen in the probability value (Prob.) of random cross-section with the following hypothesis:

H0: The model follows the REM if the probability (Prob.) of random cross-section > (0.05)
Ha: The model follows the FEM if the probability (Prob.) of random cross-section < (0.05)

Table 6: Fixed effect model test results

Dependent Variable: Y				
Method: Least Squares Panel				
Periods included: 5				
Cross-sections included: 19				
Total panel (balanced) observations: 95				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	0.297615	0.343215	0.867137	0.3888
X1	4.35E-15	1.79E-15	2.433218	0.0175
X2	0.001955	0.006116	0.319704	0.7501
X3	0.000790	0.008812	0.089648	0.9288
X4	−0.070333	0.253229	−0.277743	0.7820
X5a	0.055016	0.046051	1.194679	0.2362
X5b	−0.162978	0.081276	−2.005243	0.0488
Cross-section fixed (dummy variables)				
R-squared	**0.674638**	**Mean dependent var**		**0.778947**
Adjusted R-squared	0.563086	SD dependent var		0.417157
SE of regression	0.275739	Akaike info criterion		0.482209
Sum squared resid	5.322232	Schwarz criterion		1.154282
Likelihood logs	2.095087	Hannan-Quinn Criter		0.753777
F-statistics	6.047717	Durbin-Watson stat		1.476816
Prob (F-statistic)	0.000000			

Source: Eviews 10 Data Processing

Based on the test results in Table 9, it can be seen that the probability value (Prob.) of random cross-section shows the number 0.0856 where this number is greater than the test significance level of 0.05, it can be concluded that the REM is more feasible to use than the FEM.

4.4.3. Lagrange multiplier test

The Lagrange Multiplier test is used to select the model used whether the Random Effects model is better than the Common Effects (CEM) model. This test can be seen on the probability values of Honda, King-Wu and SLM with the following hypothesis:

H0: Model following the CEM if the Honda, King-Wu and SLM Cross-section Probability values > (0.05)

Ha: Modelfollow the REM if the Probability of Cross-section Honda, King-Wu and SLM < (0.05)

Based on the test results in Table 10 it can be seen that the Probability (Prob.) Honda, King-Wu and SLM values show the number 0.000where the number is smaller than the test significance level of 0.05, it can be concluded that the REM is more feasible to use than the CEM.

4.4.4. Model conclusion

Based on the results of the tests that have been carried out, it can be decided that the panel data regression model that will be used in the hypothesis testing and panel data regression equation is the REM model (Table 11).

4.5. Feasibility of Model Panel Data Regression Model

Based on the model selection test, the panel data regression used in this study is the REM. The REM analysis is described as follows:

Table 7: Random effect model test results

Cross-sections included: 19				
Total panel (balanced) observations: 95				
Swamy and Arora estimator of component variances				
Variable	**Coefficient**	**Std. Error**	**t-Statistics**	**Prob.**
C	0.317635	0.211731	1.500181	0.1371
X1	3.33E-17	8.02E-16	0.041543	0.9670
X2	0.002483	0.005879	0.422325	0.6738
X3	−0.001279	0.008337	−0.153417	0.8784
X4	0.159327	0.129112	1.234018	0.2205
X5a	0.073477	0.032807	2.239693	0.0276
X5b	−0.096599	0.061916	−1.560159	0.1223
Effects Specification				
	SD		**Rho**	
Random cross-section	0.280094		0.5078	
Idiosyncratic random	0.275739		0.4922	
Weighted Statistics				
R-squared	0.117097	Mean dependent var		0.313867
Adjusted R-squared	0.056899	SD dependent var		0.292035
SE of regression	0.283605	Sum squared resid		7.078017
F-statistics	1.945192	Durbin-Watson stat		1.107582
Prob (F-statistic)	0.082269			
Unweighted Statistics				
R-squared	0.192898	Mean dependent var		0.778947
Sum squared resid	13.20249	Durbin-Watson stat		0.593788

Source: Eviews 10 Data Processing

Table 8: Chow test results

Effects Test	Statistics	df	Prob.
Cross-section F	5.088719	(18.70)	0.0000
Cross-section Chi-square	79.477949	18	0.0000

Source: Eviews 10 Data Processin

Table 9: Housman test results

Test Summary	Chi-sq. Statistics	Chi-sq. df	Prob.
Random cross-section	11.092751	6	0.0856

Source: Eviews 10 Data Processing

4.5.1. Linear regression test

This research with panel data regression is used to see the effect of the independent variable on the dependent variable. The equation of the panel data regression model in this study uses REM (BRAKE) as in Table 7 and poured with the following equation:

Carbon Emission Disclosure = 0.317635+3.33E-17 X1 + 0.002483 X2 − 0.001279 X3 + 0.159327 X4 + 0.073477 X5a − 0.096599 X5b

The above equation can be explained as follows:

a. The constant of 0.317635 states that if the firm size, profitability, leverage, institutional ownership, board size, board independence variables are considered zero then the Carbon Emission Disclosure is worth 0.317635.

b. Firm size coefficient value is 3.33E-17 with a positive mathematical sign, it means that firm size has a positive effect on Carbon Emission Disclosure. This means that every 1% increase in firm size will be followed by an increase in Carbon Emission Disclosure of 3.33E-17 assuming the other coefficients are held constant.
c. Profitability coefficient value of 0.002483 with a positive mathematical sign means that profitability has a positive effect on Carbon Emission Disclosure. This means that every 1% increase in profitability will be followed by an increase in Carbon Emission Disclosure of 0.002483 assuming the other coefficients are held constant.
d. Leverage coefficient value of -0.001279 with a negative mathematical sign, it means that leverage has a negative effect on Carbon Emission Disclosure. This means that every 1% increase in leverage will be followed by a decrease in Carbon Emission Disclosure of −0.001279 assuming the other coefficients are held constant.
e. Institutional ownership coefficient value of 0.159327 with a positive mathematical sign, it means that institutional ownership has a positive effect on Carbon Emission Disclosure. This means that every 1% increase in institutional ownership will be followed by an increase in Carbon Emission Disclosure of 0.159327 assuming the other coefficients are held constant.
f. Board size coefficient valueof 0.073477with a positive mathematical sign, it means that the board size has a positive effect on Carbon Emission Disclosure. This means that every 1% increase in board size will be followed by an increase in Carbon Emission Disclosure of 0.073477 assuming the other coefficients are held constant.
g. Board independence coefficient valueof −0.096599 with a negative mathematical sign, it means that board independence has a negative effect on Carbon Emission Disclosure. This means that every 1% increase in board independence will be followed by a decrease in Carbon Emission Disclosure of-0.096599 assuming the other coefficients are held constant.

Table 10: Lagrange multiplier test results

Null (no rand. Effect) Alternative	Cross-section one-sided	Period one-sided	Both
Honda	4.823878	1.639079	4.570001
	(0.0000)	(0.0506)	(0.0000)
King-Wu	4.823878	1.639079	3.539511
	(0.0000)	(0.0506)	(0.0002)
SLM	6.185065	2.064148	--
	(0.0000)	(0.0195)	--
GHM	--	--	25.95638
	--	--	(0.0000)

Source: Eviews 10 Data Processing

Table 11: Model conclusion

Method	Test	Results
Chow test	CEM vs. FEM	FEM
Hausman test	REM vs. FEM	REM
Lagrange Multiplier Test	REM vs. CEM	REM

Source: Eviews 10 Data Processing

4.5.2. Coefficient of determination test

Determinant coefficient testing is carried out with the aim of knowing the percentage of firm size, profitability, leverage, Institutional Ownership, Board Size, Board Independence variables on Carbon Emission Disclosure. These results can be seen in the following Table 12.

The model estimation results show a very high R2, namely 0.056899, this value indicates that the magnitude of the influence of the independent variable on the dependent variable is 5.68% while the rest is explained by other variables that are not included in the model. Meanwhile, the adjusted R-squared value is 0.117097, which means that the variation of the independent variable is able to explain 11.70% of the variation in the dependent variable and the rest is explained by other variables not examined.

4.5.3. F Uji test

The statistical test of the F test was carried out with the aim of knowing the feasibility of firm size, profitability, leverage, Institutional Ownership, Board Size, Board Independence variables on Carbon Emission Disclosure. These results can be seen in the following F test table.

Based on the results shown in Table 13, the Fcount value is1.945192 while F table is 2.20, thus Fcount is smaller than F table (1.945192 < 2.20). While the probability value of 0.082269 greater than 0.05 or 5% (0.082269 > 0.05), which means that simultaneously firm size, profitability, leverage, Institutional Ownership, Board Size, and Board Independence variables have no and no significant effect on Carbon Emission Disclosure. So that it can be interpreted that this model is not feasible to use and cannot predict the effect of firm size, profitability, leverage, Institutional Ownership, Board Size, and Board Independence variables on Carbon Emission Disclosure.

4.5.4. t-test

Statistical testing of the t-test was carried out with the aim of knowing the significance of the influence of firm size, profitability, leverage, Institutional Ownership, Board Size, and Board Independence individually on Carbon Emission Disclosure. These results can be seen in the following t-test Table 14.

Table 12: Determinant coefficient test results

R-squared	0.117097
Adjusted R-sqaured	0.056899
SE of regression	0.283605
F-statistics	1.945192
Prob (F-statistic)	0.082269

Source: Eviews 10 Data Processing

Table 13: F test Results

R-squared	0.117097
Adjusted R-sqaured	0.056899
SE of regression	0.283605
F-statistics	1.945192
Prob (F-statistic)	0.082269

Source: Eviews 10 Data Processing

The t-test was carried out using criteria based on the comparison of the t-statistical value (tcount) of each independent variable coefficient to the t table value and also based on probability (ρ). Where in this study it is known that the t table value is 1.66.

5. DISCUSSION

5.1. The Results of Testing the Firm Size Variable on Carbon Emission Disclosure

Based on Table 14, the value of tcount is obtained for the firm size. Variable of 0.041543 more smaller than the t table value of 1.66. The probability value of 0.9670 is greater than the significance value (0.9670 > 0.05). So it can be interpreted that Firm size has no effect and is not significant on Carbon Emission Disclosure.

The results of this study are in line with the research conducted Amran et al., (2014), Guenther et al., (2016), Irwhantoko and Basuki, (2016), Li et al., (2018), Kurnia et al., (2021) where firm size has no and no significant effect on Carbon Emission Disclosure. However, this is not in line with the research conducted Brammer and Pavelin, (2008), Liu and Anbumozhi, (2009), Prado-Lorenzo et al., (2009), Reverte (2009), Y. Li et al., (2014), Eleftheriadis and Anagnostopoulou, (2015), Peng et al., (2015), D'Amico et al., (2016), Abdullah et al., (2020), Ratmono et al., (2021).

5.2. Results of Testing the Profitability Variable on Carbon Emission Disclosure

Based on Table 4.14, the tcount value for the profitability variable is 0.422325 which is smaller than the t table value of 1.66. The probability value of 0.6738 is greater than the significance value (0.6738 > 0.05). So it can be interpreted that profitability has no negative and insignificant effect on Carbon Emission Disclosure.

The results of this study are in line withBrammer and Pavelin, (2008), Reverte, (2009), Eleftheriadis and Anagnostopoulou, (2015), Li et al., (2018), Allam and Diyanty, (2020), Kurnia et al., (2021) where profitability has no and no significant effect on Carbon Emission Disclosure. However, this is not in line with the research conducted Prado-Lorenzo et al., (2009), Upadhyay et al., (2015), Abdullah et al., (2020), Garzón-Jiménez and Zorio-Grima, (2021), Ratmono et al., (2021).

5.3. The Results of Testing the Leverage variable on Carbon Emission Disclosure

Based on Table 4.14, the tcount value for the leverage variable is −0.153417 which is smaller than the t table value of 1.66. The probability value of 0.8784 is greater than the significance value (0.8784 > 0.05). So it can be interpreted that leverage has no effect and is not significant on Carbon Emission Disclosure.

Table 14: t-test results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	0.317635	0.211731	1.500181	0.1371
X1	3.33E-17	8.02E-16	0.041543	0.9670
X2	0.002483	0.005879	0.422325	0.6738
X3	−0.001279	0.008337	−0.153417	0.8784
X4	0.159327	0.129112	1.234018	0.2205
X5	0.073477	0.032807	2.239693	0.0276
X6	−0.096599	0.061916	−1.560159	0.1223

Source: Eviews 10 Data Processing

The results of this study are in line with Brammer and Pavelin, (2008), Reverte, (2009), Eleftheriadis and Anagnostopoulou, (2015), Guenther et al., (2016), Kurnia et al., (2021) where leverage has no and no significant effect on Carbon Emission Disclosure. However, this research is not in line with the research conducted Prado-Lorenzo et al., (2009), Y. Li et al., (2014), Peng et al., (2015), Li et al., (2018), Abdullah et al., (2020), Ratmono et al., (2021)

5.4. The Results of the Institutional Ownership Variable Testing on Carbon Emission Disclosure

Based on Table 4.14, it is obtained that the tcount value for the institutional ownership variable is 1.234018 which is smaller than the t table value of 1.66. The probability value of 0.2205 is greater than the significance value (0.2205 > 0.05). So it can be interpreted that institutional ownership has no effect and is not significant on Carbon Emission Disclosure.

The results of this study are in line with the research conducted Li et al., (2018), Hardiyansah et al., (2021), which states that institutional ownership has no and no significant effect on Carbon Emission Disclosure. However, this research is not in line with the research conducted Akbaş and Canikli, (2019), Andrian and Kevin, (2021)

5.5. The Results of Testing the Board Size Variable on Carbon Emission Disclosure

Based on Table 4.14, the tcount value for the board size variable is 2.239693, which is greater than the t table value of 1.66. The probability value of 0.0276 is smaller than the significance value (0.0276 < 0.05). So it can be interpreted that the board size has a positive and significant effect on Carbon Emission Disclosure.

The results of this study are in line with the research conducted Yunus et al., (2018)where the board size has a positive and significant effect on Carbon Emission Disclosure. However, this study is not in line with Amran et al., (2014), Nasih et al., (2019), Akbaş and Canikli, (2019), Kılıç and Kuzey, (2019), Andrian and Kevin, (2021) where the board size has no and no significant effect on Carbon Emission Disclosure.

5.6. The Results of Testing the Board Independence Variable on Carbon Emission Disclosure

Based on Table 4.14, it is obtained that the tcount value for the board independence variable is −1.560159 which is smaller than the t table value of 1.66. The probability value of 0.1223 is greater than the significance value (0.1223 > 0.05). So it can be interpreted that board independence has no effect and is not significant on Carbon Emission Disclosure.

The results of this study are in line with the research conducted Li et al., (2018), Kılıç and Kuzey, (2019) which states that board independence has no and no significant effect on Carbon Emission Disclosure. However, this is not in line with the research conducted Yunus et al., (2018)

6. CONCLUSIONS AND RECOMMENDATIONS

Based on the results and discussions that have been described previously, the conclusions in this study are as follows:

1. Firm sizeno effect and no significant on Carbon Emission Disclosure.
2. Profitabilityno effect and no significant on Carbon Emission Disclosure.
3. Leverageno effect and no significant on Carbon Emission Disclosure.
4. Institutional ownershipno effect and no significant on Carbon Emission Disclosure.
5. Board sizepositive and significant effect on Carbon Emission Disclosure.
6. Board independenceno effect and no significant on Carbon Emission Disclosure.

Based on the conclusions above, the suggestions in this study are:

1. For Investors
   For investors, it is better to start considering the Carbon Emission Disclosure activities disclosed by the company in carrying out environmental improvements. Investors must assess the company's sustainability not only from the level of dividends, but also in terms of fulfilling the company's obligations in managing its social responsibilities.
2. For Companies
   Given that firm size, profitability, leverage, institutional ownership, and board independence have no and no significant effect on Carbon Emission Disclosure, it is advisable to increase the company's Carbon Emission Disclosure disclosure in order to maintain its obligations to the environment.
3. For Next Researchers
   It is recommended for the next researcher to conduct research using other variables, a longer period of time, theories, and other models. So that more varied results are obtained.

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