

Disclosure of Carbon Emissions as Moderating Variables and Effects of Green Accounting, and Corporate Social Responsibility on Firm Value

(Empirical Study of Mining Sector Companies Listed on the Indonesia Stock Exchange in 2018-2020)

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Abstract: With use declaration emission carbon as variable moderation, research This try For know How influence greenaccountingandcorporatesocialresponsibilitytowards mark company on company sector mining traded on the Indonesia Stock Exchange from 2018 to 2020. Research This using additional data, which includes 65 records _ business chosen as sample study with use purposive sampling method, on which it is based on set criteria sample. Analysis multiple linear regression and analysis modified regression (MRA) was used in data analysis with SPSS version 26. Findings disclose that while corporate social responsibility has impact big on mark companies, whilegreenaccountingis not. Besides that, the impact of green accounting on mark company part can reduced with disclosure emission carbon. However, impact corporatesocialresponsibilityto mark company No can reduced with disclosure emission carbon.

Keywords: Firm Value, Green Accounting, Corporate Social Responsibility, and Disclosure of Carbon Emissions.

1. Introduction

The end _ This Ministry Environment Busy life _ right with issue about pollution environment and house gases glass. Concern world to circumstances continuous environment _ continuously broken, wrong only one caused by activity company. According to the cited data from WALHI Indonesia on 18 May 2019 that company responsible biggest answer _ on damage environment in Indonesia. The company is responsible answer over 39.4% damage nature in Indonesia, burning ongoing forest _ a number of year And No only annoying Indonesia but Also country neighbor such as Singapore, Malaysia, as well as Brunei Darussalam. In some parts of the world's major countries, they are very concerned about global warming and are trying to find ways to minimize greenhouse gases for climate change in the world (Egbunike & Emudainohwo, 2017). The issue put forward regarding the reduction of global warming is a problem that is currently being seriously discussed in various parts of the world. One of the causes of this problem is greenhouse gases. Indonesia is one of the countries that produces greenhouse gas emissions in the world.

The problems of environmental pollution and greenhouse gases in the world are accompanied by an increase in social crises which have caused company performance to have a direct impact on company value, and have led to competition between companies which is constantly increasing. This intense competition requires companies to maintain their position, so companies must implement various strategies to deal with competition in maintaining and improving company performance which is the company's main goal by focusing on the company's operational and financial activities.

Green accounting was found to have a positive impact on company value in previous research by Ajeng & Gracelia (2022) stating that green accounting has a significant influence on company value. However, in another study conducted by Shella & Franco (2021) it was concluded that green accounting has no effect on company value. Meanwhile, corporate social responsibility was found to have a positive impact on firm value in a previous study by Erlangga et.al (2021) which stated that corporate social responsibility disclosures by companies had a positive impact on firm value. Other research conducted by Khasanah and Sucipto (2020) also states that corporate social responsibility has a positive impact on company value, but research conducted by Cessilia & Hutabarat (2018) states that corporate social responsibility has no effect on company value.

In previous studies, carbon emission reports were usually used as independent and dependent variables. Disclosure of carbon emissions is used as the dependent variable to assess the capacity of this variable as an outcome, while disclosure of carbon emissions is used as an independent variable to assess the capacity of this variable as a cause. In this study, researchers include disclosure of carbon emissions as a moderating variable

based on the description of the problem context given above. The decision to position the variable was made with the aim of increasing the impact of disclosing carbon emissions whose existence and function aim to reduce the impact of green accounting and corporate social responsibility on firm value.

2. Literature Review and Hypothesis

2.1 Legitimacy Theory

Legitimacy theory reveals that organizations or companies must continuously ensure whether they have operated within the norms upheld by society and ensure that their activities can be accepted by outsiders. Companies that can socialize well with the community can improve their reputation which will ultimately affect the value of the company.

2.2 Stakeholder Theory

Stakeholder theory basically states that a company is an entity that not only operates for its own interests but must contribute to providing benefits for stakeholders, including creditors, suppliers, shareholders, consumers and society. Stakeholder theory states that companies are not only responsible for maximizing profits for owners of investors, but also must provide benefits to the environment in which the company operates which in turn can also benefit the surrounding community.

2.3 Carbon Emissions Disposal

CO₂ emissions from time to time continue to increase both at the global and local levels. This is due to the increasing use of energy from organic materials (fossils), changes in land use and forest fires, as well as an increase in anthropogenic activities. Transparency through the annual report is expected to increase the public's sense of trust in the company, which not only observes the importance of financial reports but also important information related to disclosure of carbon emissions.

2.4 Firm Value

Company value is a number or value that shows the level of evaluation of a company for its success in managing and carrying out its business activities. When a company has offered its shares to the public, the value of the company is used as a benchmark by investors in making investment decisions.

2.5 The Effect of Green Accounting on Firm Value

The application of green accounting is very influential on the development of the company, if the application of green accounting is done well, the value of the company will also increase so that it can attract investors to invest in the company.

H1 = Green Accounting Has an Influence on Firm Value

2.6 The Effect of Corporate Social Responsibility on Company Value

Stakeholder theory believes that the success of a company depends on how capable the company is in meeting the needs of stakeholders and the surrounding community, these needs can include economic and non-economic needs.

H2 = Corporate Social Responsibility Has an Influence on Company Value

2.7 The Effect of Green Accounting on Firm Value with Carbon Emission Disclosure as a Moderating Variable

Good implementation of green accounting can help in subtraction carbon emissions, carbon emissions can gas from _ pollution air from activity human, who can damage environment And health human. So that If company succeed in effort application of green accounting can give Power pull to investors and can increase mark company.

H3 = Disclosure of Carbon Emissions Moderates the Effect of Green Accounting on Firm Value

2.8 The Effect of Corporate Social Responsibility on Company Value with Carbon Emission Disclosure as a Moderating Variable

Corporate social responsibility is a company program in its efforts to protect the environment in which the company operates. If the company can properly realize its responsibility towards the environment, the company will also participate in efforts to reduce carbon emission disclosures

H4 = Disclosure of Carbon Emissions Moderates the Effect of Corporate Social Responsibility on Company Value

2.9 Research Concept

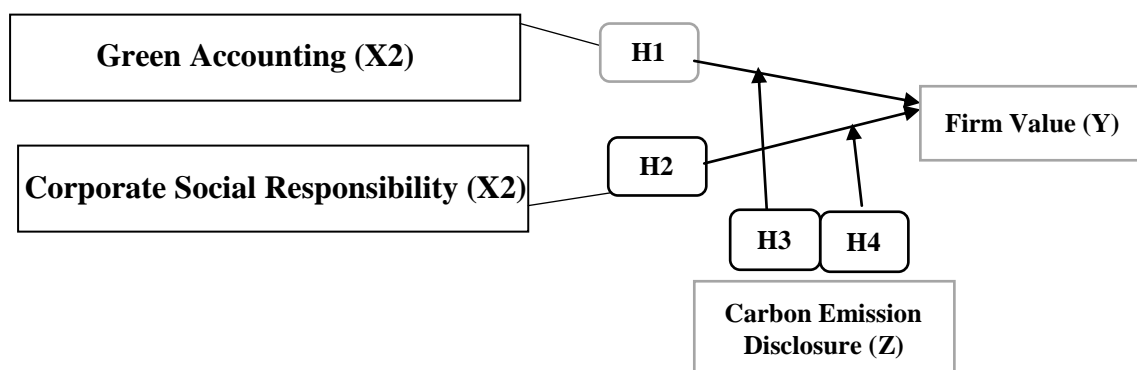


Figure 1: Conceptual Research

3. Research Methodology

3.1 Types of Research

This study uses a quantitative method with comparative explanations and figures taken from the Indonesian Stock Exchange (IDX) to determine the effect of the independent variables on the dependent variable and/or through moderating variables which are interconnected and can be compared.

3.2 Population and Sample

The population in this study are mining companies listed on the Indonesia Stock Exchange in the observation range from 2018-2020. The selection method used was purposive sampling.

3.3 Data Collection Methods

The data collection method used is the documentation method. The documentation method is carried out using data derived from existing documents. In this study sourced from the Indonesian Stock Exchange website.

3.4.1 Independent Variables

The value of the company

By determining the ratio of the stock price to the book value of equity, the value of the company will be determined. Calculation of price book value (PBV) is as follows:

$$PBV = \frac{\text{Share Price}}{\text{Book Value}} \times 100\%$$

3.4.2 Dependent Variables

A. Green Accounting

The measurement of the application of green accounting is used by taking into account the environmental disclosure indicators disclosed in the annual report.

Table 1 Analysis Content Green Accounting

No	Score	Explanation
1	0	Companies that don't do disclosure indicator <i>green accounting</i> in the annual report
2	1	Companies that do disclosure indicator <i>green accounting</i> in form numbers / pictures in the annual report
3	2	Companies that do disclosure indicator <i>green accounting</i> in form narrative in the annual report
4	3	Companies that do disclosure indicator <i>green accounting</i> in form supported narrative _ number or picture in the annual report

Source: Selpiyanti & Fakhroni 2020

B. Corporate Social Responsibility

Disclosure of social responsibility is measured by using CSRDI (corporate social responsibility disclosure index) proxy based on GRI (global reporting initiative) indicators. The CSRDI formula is as follows:

$$CSR_{ij} = \frac{\sum X_{ij}}{n_j}$$

Information:

CSR_{ij} : Corporate Social

Responsibility Disclosure

Company index j

n_j : Number of company items

$n_j = 78$ (maximum score)

$\sum X_{ij}$: the total number of CSR disclosures by the company

(Source:Septi et al, 2022)

3.4.3 Moderation Variables

Disclosure of Carbon Emissions

There are five groups and 18 elements that are in accordance with the disclosure of carbon emissions in the research by Choi et al. (2013). Each transparency item is given a score of 1, with a lowest score of 0 and a maximum score of 18, to determine this variable's value. The Carbon Emissions Disclosure (CED) algorithm is as follows:

$$CED = \frac{\text{Disclosed Items}}{\text{Total Item by CDP}} \times 100\%$$

3.5 Analisis Regresi Linier Berganda

Multiple linear regression was used in this study's research in order to determine how the independent factors affected the dependent variable. Consequently, the following solution can be used to verify the theory:

Equation 1 (Without Moderating Variable):

$$PBV = \alpha + \beta_1 GA + \beta_2 CSR + \varepsilon$$

Equation 2 (With Moderating Variable):

$$PBV = \alpha + \beta_1 GA + \beta_2 CSR + \beta_3 CED + \beta_4 GA * CED + \beta_5 CSR * CED + \varepsilon$$

Keterangan:

PBV = Price to Book Value (Firm Value)

GA = Green Accounting

CSR = Corporate Social Responsibility

CED = Carbon Emission Disclosure

$GA * CED$ = Carbon Emission Disclosure and Green Accounting Interaction

$ROA * CED$ = Carbon Emission Disclosure and Corporate Social Responsibility Interaction

α = Constant $\beta_1 - \beta_7$ = Regression Coefficient

ε = Error Term

4. Results and Discussion

4.1 Descriptive Statistical Analysis

Table 2 Results Analysis Statistics Descriptive

Variable	N	Minimum	Maximum	Means	std. Deviation
GA	61	2	3	2.36	0.484
CSR	61	0,179	0,628	0,36005	0,125270
CED	61	0,111	0,944	0.43620	0,299702

PBV	61	0,096	2,384	0,88769	0,552703
GA*CED	61	0,222	2.833	1,06734	0,826181
CSR*CED	61	0,026	0,593	0,17275	0,160715
VALID N (listwise)	61				

Source: Results of analyzing SPSS data, 2023

Table 2 interpretation can be as follows:

1. The measurement of the company value variable uses price book value, has a value range from 0.096 to 2.384 with an average (mean) of 0.88769 and a standard deviation of 0.552703
2. Green accounting variable measurement has a range of values from 2 to 3 with an average (mean) of 2.36 and a standard deviation of 0.484
3. The measurement of the corporate social responsibility variable has a value range from 0.179 to 0.628 with an average (mean) of 0.36005 and a standard deviation of 0.125270
4. Measurement of the carbon emission variable has a value range from 0.111 to 944 with an average (mean) of 0.43620 and a standard deviation of 0.299702
5. Green accounting measurements with moderation in disclosure of carbon emissions have a value range of 0.222 to 2.833 with an average (mean) of 1.06734 and a standard deviation of 0.826181
6. Measurement of corporate social responsibility with moderation in disclosure of carbon emissions has a value range of 0.026 to 0.593 with an average (mean) of 0.172275 and a standard deviation of 0.160715.

4.2 Classic assumption test

4.2.1 Normality Test

Table 3 Normality Test Results

Variable	Equation 1		Equation 2		Keterangan
	Kolmogorov - Smirnov Exact . Sig. (2- tailed)	Z Information	Kolmogorov- Smirnov Exact. Sig. (2- tailed)	Z	
Unstandardized Residual	0,051	Berdistribusi Normal	0,211		Berdistribusi Normal

Source: Results of analyzing SPSS data, 2023

According to the findings of the normality test in table 2, equations 1 and 2 both yield values for the Kolmogorov-Smirnov Exact Sig (2-tailed) that are greater than = 0 or 5%, 0,051 and 0,211, respectively. The statistics are therefore presumed to be normally distributed.

4.2.2 Uji Multikolinieritas

Tabel 4 Hasil Uji Multikolinearitas

Model (Constant)	Collinearity Statistics		Information
	tolerance	VIF	
GA	0.930	1,076	No There is Multicollinearity
CSR	0.818	1.223	No There is Multicollinearity
CED	0.777	1,287	No There is Multicollinearity

Source: Results of analyzing SPSS data, 2023

According to the findings of the multicollinearity test in table 4, demonstrates that there is no multicollinearity in the regression model between the independent variables because the independent variable has a tolerance value (TV) higher than 0,10 and a variance inflation factor (VIF) value less than 10.

4.2.3 Uji Heterokedastisitas

Tabel 5 Hasil Uji Heteroskedastisitas

Variabel	Persamaan 1	Persamaan 2	Keterangan
	<i>P-Value</i>	<i>P-Value</i>	
GA	0,533	0,953	Pass Test Heteroscedasticity
CSR	.635 _	.550 _	Pass Test Heteroscedasticity
CED		0.120	Pass Test Heteroscedasticity
GA *CED		0.194	Pass Test Heteroscedasticity
C S R *CED		0.232 _	Lolos Uji Heteroskedastisitas

Source: Results of analyzing SPSS data, 2023

According to the findings of the heteroscedasticity test in table 4, demonstrates that the regression model from equations 1 and 2 passes the heteroscedasticity test, with a significant value higher than 0,05 or 5% (P 0,05 or 5%) for each independent variable.

4.2.4 Uji Autokorelasi

Tabel 6 Hasil Uji Autokorelasi

Persamaan 1		Persamaan 2	
Durbin-Watson	1,606	Durbin-Watson	1,472

Source: Results of analyzing SPSS data, 2023

According to the findings of the autocorrelation test in table 5, demonstrates that equations 1 and 2 result in Durbin-Watsons of 1,606 and 1,472, respectively. As a result, it can be said that there is no autocorrelation because the regression model in use meets the requirement of a DW number between (-2) and (+2).

4.3 Uji Hipotesis

4.3.1 Uji Regresi Linier Berganda

Tabel 7 Hasil Uji Regresi Linier Berganda

Variabel	Persamaan 1			Persamaan 2		
	Koefisien	t	Sig	Koefisien	t	Sig
(Constant)	0,367	1,249	0,217	0,696	-0,916	0,364
GA	0,141	-0,485	0,630	0,264	1,430	0,158
CSR	0,544	3,011	0,004	1,075	1,542	0,129
CED				1,308	1,940	0,058
GA*CED				0,471	-2,078	0,042
CSR*CED				1,814	-0,087	0,931
Adjusted R2	0.105			0.130		
F _{count}	4,536			2,795		
Sig	0.015			0.026		

Source: Results of analyzing SPSS data, 2023

Based on the results in the table above, the regression equation can be obtained, as follows:

Equation 1:

$$PBV = 0.367 - 0.141 GA + 0.544 CSR + \varepsilon$$

Equation 2:

$$PBV = 0.696 + 0.264 GA + 1.075 CSR - 1.308 CED - 0.471 GA*CED + 1.814 CSR*CED + \varepsilon$$

It is possible to understand equation 1 in table 6 as follows:

1. A constant value (α) of 0.367 means that if all the independent variables consisting of green accounting (GA) and corporate social responsibility (CSR) are considered constant, then the level of the dependent variable, namely firm value (PBV), remains at 0.367.
2. The green accounting (GA) β_1 coefficient value of 0.141 means that if a company discloses green accounting (GA) it will have an impact on increasing the company's value (PBV) of 0.141.
3. The coefficient value of corporate social responsibility (CSR) β_2 is 0.544 meaning that if a company discloses corporate social responsibility (CSR) it will have an impact on firm value (PBV) which will increase by 0.544 times.
4. ε is an error term, which explains that there will be other assessment criteria that can affect firm value (PBV) in this study.

It is possible to understand equation 2 in table 6 as follows:

1. A constant value (α) of 0.696 means that if all the independent variables consist of green accounting (GA), and corporate social responsibility (CSR) with carbon emission disclosure as the moderating variable studied is considered constant, then the level of the dependent variable, namely firm value (PBV), remains at 0.696.
2. The green accounting (GA) β_1 coefficient value of 0.264 means that if a company discloses green accounting (GA) it will have an impact on increasing the company's value (PBV) of 0.264.
3. The coefficient value of corporate social responsibility (CSR) β_2 is 1.075, meaning that if a company discloses corporate social responsibility (CSR) it will have an impact on company value (PBV) which will increase by 1.075 times.
4. The value of the carbon emission disclosure coefficient β_3 is 1.308, meaning that if there is an increase in carbon emission disclosure by 1 unit, it will have an impact on firm value (PBV) which will increase by 1.308 times.
5. Mark moderated green accounting (GA) coefficient β_4 with *carbon emissions disclosure* of 0.471 means if variable green accounting interactions and *carbon emission disclosure* (GA *CED) occurs accompanied by green accounting disclosures disclosure of carbon emission disclosure, then will impact on mark company (PBV) that will increase of 0.471 times.
6. Mark moderated coefficient of corporate social responsibility (CSR) β_5 with *carbon emissions disclosure* of 1.814 means if variable corporate social responsibility interactions And *carbon emission disclosure* (CSR *CED) occurs disclosure accompanying corporatesocialresponsibility disclosure of carbon emission disclosure, then will impact on mark company (PBV) that will increase of 1.814 times.

7. ϵ is an error term, which explains that there will be other assessment criteria that can affect firm value (PBV) in this study.

4.3.2 Test of the Coefficient of Determination (R²)

Table 8 Results Test Coefficient Determination (R²)

Equation 1		Equation 2	
<i>Adjusted R Square</i>	0.105	<i>Adjusted R Square</i>	0.130

Source: Results of analyzing SPSS data, 2023

Based on the results of multiple linear regression testing in equation 1, it shows that the coefficient of determination (Adjusted R²) is 0.115. It can be concluded that the independent variables, namely green accounting (GA), and corporate social responsibility (CSR) are able to explain the dependent variable, namely firm value (PBV) of 10.5%, while 89.5% is influenced by other variables outside the research model. While the multiple linear regression test on equation 2 based on shows that the value of the coefficient of determination (Adjusted R²) is 0.130. It can be concluded that the independent variables, namely green accounting (GA), and corporate social responsibility (CSR) along with their moderating variable, namely Carbon Emission Disclosure (CED) are able to explain the dependent variable, namely firm value (PBV) of 13.0%, while 87.0% influenced by other variables outside the research model.

4.3.3 Simultaneous Significance Test (F Test)

Table 9 Results Test Significant Simultaneous (Test F)

Model	Equation 1		Equation 2	
	F	Sig.	F	Sig.
Regression	4,536	0.015b -	2,795	0.026b -

Source: Results of analyzing SPSS data, 2023

Based on the results of multiple linear regression in equation 1, the Fcount value is 4.536 with a probability value of 0.015 < 0.05 (p < 0.05). This shows that the independent variables, namely green accounting (GA), and corporate social responsibility (CSR) simultaneously or together can have a significant effect on firm value (PBV).

Based on the results of multiple linear regression in equation 2 in the table, the Fcount value is 2.795 with a probability value of 0.026 < 0.05 (p < 0.05). This shows that the independent variables, namely green accounting (GA) and corporate social responsibility (CSR) along with their moderating variable, namely Carbon Emission Disclosure (CED) simultaneously or together can have a significant effect on firm value (PBV).

4.3.4 Test of Significance of Individual Parameters (T-test Statistics)

Table 10 Results Test Significance of Individual Parameters (Test Statistics t)

Model		Equation 1 Sig.	Equation 2 Sig.
1	GA	0.630	0.158
	CSR	0.004	0.129
	CE D		0.058
	GA *CED		0.042
	C S R *CED		0.931

Source: Results of analyzing SPSS data, 2023

Results multiple linear regression on test significant individual parameters (test statistic t), as following this :

1. Mark significance variable greenaccountinghavet_{count} -0.485 with mark significance of $0.630 \geq 0.05$ then H1 is rejected, meaning that green accounting is not influential significant to mark company (PBV). this _ show that the hypothesis that green accounting has an effect to mark company (PBV) is not proven.
2. Mark significance variable corporatesocialresponsibility own t_{count} 3.011 with mark significance of $0.004 \leq 0.05$ then H2 is accepted, meaning corporatesocialresponsibility influential significant to mark company (PBV). this _ show that stated hypothesis _ corporatesocialresponsibility influential to mark proven company (PBV).
3. The significance value of the green accounting variable moderated by carbon emission disclosure has a tcount of -2.078 with a significance value of $0.042 \leq 0.05$, so H3 is accepted. This means that carbon emission disclosure has a significant effect on the relationship between green accounting (GA) and firm value (PBV). This shows that the hypothesis which states that carbon emission disclosure has an effect on the relationship between green accounting (GA) and firm value (PBV) is proven.
4. The significance value of the corporate social responsibility variable which is moderated by carbon emission disclosure has a tcount of 1.814 with a significance value of $0.931 \geq 0.05$, then H4 is rejected. This means that carbon emission disclosure has no significant effect on the relationship between corporate social responsibility company value (PBV). This shows that the hypothesis which states that carbon emission disclosure has an effect on the relationship between corporate social responsibility and company value (PBV) is not proven.

5. Conclusion

From the results of the research and discussion above, it can be concluded as follows: (1) Green accounting has no significant effect on firm value; (2) Corporate social responsibility has a significant effect on company value; (3) Disclosure of carbon emissions is able to moderate green accounting on company value; (4) Disclosure of carbon emissions is not able to moderate corporate social responsibility towards company value.

Disclosure of carbon emissions is usually considered as an independent and dependent variable in research so far. However, in this study the researchers used disclosure of carbon emissions as moderation, and these findings succeeded in showing that disclosure of carbon emissions can affect the relationship between green accounting disclosure and company value.

The results of this study resulted in several theoretical advances, one of which is that disclosure of carbon emissions can mitigate the impact of green accounting on firm value. This research is to motivate companies to continue to carry out environmental responsibility, one of which is by disclosing the company's carbon emissions and increasing the company's environmental performance. With good disclosure of carbon emissions and environmental performance, stakeholders will give a positive response to the company, this will increase the company's value in the market.

The limitations of this study are that this research was only conducted within the scope of mining companies listed on the Indonesia Stock Exchange for a period of only three years 2018-2020 and the results of the coefficient of determination test (Adjust R square) show that the independent variable explains the dependent variation, namely firm value (PBV) of 0.235 or 23.5% while the remaining 76.5% is explained by other variables not included in this study. It is hoped that further research can add years of observation and add other variables that also affect firm value (PBV).

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