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The Effect of Capital Expenditure, Debt Maturity, Financial Slack on Carbon Emission Disclosure

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Abstract:- This study aims to determine the effect of Capital Expenditure, Debt Maturity, Financial Slack on Carbon Emission Disclosure. The population in this study is manufacturing companies listed on the Indonesia Stock Exchange for the 2019-2021 period. The sampling technique uses purposive sampling of 69 samples. The Analysis Methods used are Descriptive Analysis, Model Selection Test, Classical assumption Test, Hypothesis Test, Multiple Regression Test. The results show that Capital Expenditure and Financial Slack have a positive influence on Carbon Emission Disclosure. While Debt Maturity has no influence on Carbon Emission Disclosure.

Keywords:- *Disclosure of Carbon Emissions; Capital Expenditure; Debt Maturity; Financial Slack.*

I. INTRODUCTION

Since the beginning of the industrial revolution, the world has experiencing a spike about climate change. According to the results of the Environment Performance Index measurement (2022), it states that Indonesia is a country that is bad at managing environmental sustainability. It is proven that the Indonesian state is at the bottom, which is 164th out of 180 countries involved. *The sustainability of* a country is triggered by high levels of carbon emissions.

According to the Union of Concern Scientists (2020), Indonesia has been recorded to contribute in terms of carbon emissions of 0.58 GT or equivalent to 2% of world emissions. Indonesia is also known to be the eighth largest emitter of greenhouse gases that contribute to air quality in the world. This increasing heat is a serious concern for all circles (Dwinanda &; Kaweda, 2019).

Industries such as manufacturing companies have a big role in contributing to carbon emissions. manufacturing companies need energy to achieve production goals. The Ministry of Energy and Mineral Resources (2021) stated that the projected coal demand for the company's production has increased by 42% from 2025 of 58.57 million tons to 83.09 million tons in 2035. In fact, the largest emission is generated by the use of coal (Eka Chandra Pramuditya &; Budiasih, 2020). Due to the high carbon emissions produced, information disclosed by the company is needed to convey various points of company involvement to protect the environment in the form of carbon emission disclosure.

According to Syahputra et al., (2019) there are several companies that do not submit comprehensive entity carbon emission information, namely PT Bukit Asam Tbk (PTBA) in 2016 to 2017 only submitted environmental disclosures of 62% and low quality. Another company that discloses low carbon emissions is PT Indo Tambangraya Megah Tbk with disclosure levels that decreased in 2016 by 53% then in 2017 to 50%. In this case, it is proven that there are still companies that lack interest in the importance of caring for the environment. In fact, the disclosure of carbon emissions can help management in terms of decision making as an evaluation of environmental activities in the next period (Pratiwi, 2018).

Disclosure of carbon emissions can provide a transparent and reliable picture of information as an effort to prevent and reduce carbon emissions arising from the company's operating activities. In line with this, the practice of disclosing environmental responsibility is regulated in the Statement of Financial Accounting Standards (PSAK) 2019 No. 1 paragraph 9 which implicitly provides direction for companies to disclose social responsibility in the form of presenting environmental reports for the industry. The presentation of this information can be in the form of an annual report or a sustainability report.

The Financial Services Authority issued POJK regulation No. 51/2017 which regulates the implementation of sustainable finance for various business lines such as financial service institutions, issuers, and public companies by requiring these companies to report *sustainability reports*. One of the standards for delivering sustainability reports *focuses on environmental issues, but unfortunately the form of* sustainability reports *in which there is disclosure of carbon emissions disclosed by companies still varies, due to the absence of standardization of company submissions in presenting carbon emission reports related to environmental concerns* (Yuliandhari &; Setyani, 2022). Even though this report can be used by companies in terms of transparency to reduce the occurrence of climate change (*climate change*). This is why the disclosure of carbon emissions in companies in Indonesia is still voluntary because there is no strict sanction set by the government. This carbon emission disclosure was measured using a *proxy checklist* of information request sheets provided by the *Carbon Disclosure Project* project developed by (Bae Choi et al., 2013).

There are several factors that affect the disclosure of carbon emissions in companies, including Capital Expenditure. Capital Expenditure adds value to the company in terms of activity and economy. This value addition can be in the form of investment purchases in the form of fixed assets that are utilized in the future (Karim et al., 2021). Fixed assets operated by companies can contribute to poor air quality if purchased without considering renewable energy technology (Adrati &; Augustine, 2018). Therefore, investors should want to understand more about the purchase of fixed assets in order to get more complete carbon footprint information through transparent delivery with carbon emission disclosure (Karim et al., 2021).

The delivery of this information is also useful in reducing the occurrence of information asymmetry between investors and company managers to have the same information. Therefore, companies that choose to buy more capital expenditure have the opportunity to disclose higher carbon emission information. In a previous study revealed by Karim et al., (2021)Ratmono et al., (2021)Sulfitri et al., (2023) stated that Capital Expenditure has a positive influence on carbon emission disclosure. In acquiring fixed assets, companies can buy by means of credit obtained from banks.

Debt maturity is the maturity of illiquid debt (K. Q. T. Nguyen, 2022). Debt with a longer repayment term commitment has the view that the company is gaining a reputation trusted by lenders in payment obligations (Ganda, 2022). Companies that have a long maturity rate of debt are companies that have dependency on credibility obtained from lenders. This credibility can be maintained by various efforts, namely convincing lenders to convey more complete information from the company. Therefore, debt maturity can have an impact on companies in disclosing comprehensive carbon emission information. According to research conducted by (Lemma et al., 2020)(V. H. Nguyen et al., 2020) states that debt maturity is positively related to carbon emission disclosure.

Another factor influencing carbon emissions disclosure is Financial Slack. Financial Slack is the availability of a company's financial resources that exceed the needs needed to fund other activities. Financial slack can be one of the drivers for entities to be able to set aside more funds to be able to deliver more comprehensive news about the company's activities and their impact on the environment.

This study aims to provide recommendations to regulatory parties because the disclosure of carbon emissions applicable in Indonesia is still submitted in a voluntary way and there are no sanctions that strengthen the obligation to report carbon emissions so this study presents recommendations to various related parties in order to consider the importance of carbon emission disclosure.

Thus, this study will present the importance of reporting carbon emissions even though it is still voluntary, this section consists of 6 parts arranged as follows. The first part is about background reports, the second part is about literature studies, the third part is about research methods, the fourth part is about statistical test results, the fifth part is about results and discussion, the last part is about conclusions and suggestions.

II. LITERATURE STUDY

- *Stakeholder Theory*

Stakeholder theory popularized by Freeman (1984) states that to carry out the Company's operational activities not only focus on personal interests but also focus on interests *stakeholders. Stakeholders* It also has an important role in the sustainability of the company's business because it is the controller of the resources needed by the company. Therefore, the company is expected to provide benefits to stakeholders. According to Cahya (2017) One of the company's strategies in order to maintain good relations with stakeholders is information disclosure related to the company's production activities that affect the environment.

- *Legitimate Theory*

According to (Gray et al., 1995) Legitimacy theory is a corporate management system that focuses on alignment with the community, government, individuals and community groups. This legitimacy theory provides assurance to the community that the company's operational activities are prioritized, through a binding social contract between the company and the community. Companies can also transparently provide relevant information to the public at large. According to Manurung et al., (2022) stated that concern for the environment is important to be expressed explicitly or implicitly in order to have a view that the company has a positive contribution in the scope of society.

- *Agency Theory*

Agency theory conceptualized by Jensen &; Meckling (1976) Explain that there is a contract to be accountable for its duties as decision making, namely managers and investors of the company who serve as owners and supervisors of the company. Because the separation of these two tasks causes managers to have more information than investors (Primary, 2021). Conflict between managers and company owners also triggers managers to act not in accordance with the interests of the owners. Therefore, to avoid information asymmetry, it is necessary to disclose information transparently by the company so that investors can have the same information as the manager.

- *Capital Expenditure*

Capital Expenditure is a sum of money used to buy, maintain and improve fixed assets in order to have benefits in the future (Wijanto, 2021). Other meanings according to Reeve et al., (2011: 418) states that Capital Expenditure is an expense that can increase or extend the life of an asset. Companies that have a high capital expenditure value are companies that continue to grow and develop with the aim of maximizing production in order to achieve the expected profits of the company.

Capital Expenditure measurement proxy = (Net Increase in PPE)/(Total Assets) (Karim et al., 2021) (Nurainun Bangun, 2020).

➢ *Debt Maturity*

Debt Maturity is the company's due date given by the creditor to pay off a number of loans (Li & Lin, 2023). Companies that have a longer time limit have a risk of default. To anticipate this, the company can convince lenders by utilizing the financial flexibility of available funds through efforts to provide relevant information, which can be in the form of disclosure of environmental information.

According to Lemma et al., (2020) The company's long-term debt can indicate that the company that takes the initiative to report environmental information is a company that has credibility in terms of debt repayment.

Debt Maturity measurement proxy = (Long Term Liabilities)/(Total Liability) source : (Lemma et al., 2020)

➢ *Financial Slack*

Financial Slack according to Bourgeois (1981) is the existence of excess resources controlled by the entity. This excess arises from the optimization of funds utilized by the entity. The role of Financial Slack is used with the aim of adjusting in the event of economic turmoil arising from internal or external pressure. Financial Slack is used as a tool to improve environmental performance.

Financial Slack measurement proxy = (Cash and Cash Equivalent)/(Total Sales) source : (Aini et al., 2022)

➢ *Carbon Emissions Disclosure*

Carbon emission disclosure is a Corporate Social Responsibility (CSR) report consisting of a set of records related to the company's carbon performance including qualitative statements and quantitative calculations of carbon, reducing and adding carbon emission values that have implications for climate change submitted to stakeholders (Syabilla et al., 2021). This disclosure of carbon emissions comes from the concern of each individual member (Octris, 2018). Individuals who have the responsibility of managing a business must also take into account the company's cost budget by paying attention to compliance based on environmental sustainability (Hidayah et al., 2021).

- *Measurement proxy Carbon emission disclosure = (∑in/M) (Bae Choi et al., 2013)*
- *∑di = Total overall score obtained from the company's report*
- *M = Maximum items total that can be disclosed (18*

- *The Framework of Thinking in this Study can be Seen in the Following Picture:*

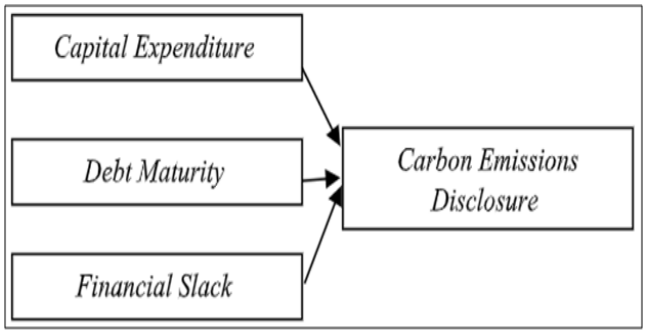

Fig 1 Framework of Thought

➢ *Hypothesis Formulation*

Based on the presentation of the theory and framework of thought, the hypothesis of this research is as follows:

- H1: Is there any effect of Capital Expenditure on carbon emission disclosure?
- H2 : Is there any effect of Debt Maturity on carbon emission disclosure?
- H3: Is there any effect of Financial Slack on carbon emission disclosure?

III. RESEARCH METHODS

The population in this study is manufacturing companies listed on the Indonesia Stock Exchange. The data collection of this study uses secondary data available on the company's website and official website from www.idx.co.id with the period 2019 to 2021. Data analysis using Econometric Views (eviews) research tool 12. The use of the Eviews 12 analysis tool is considered appropriate because it has strong analysis in conducting econometric analysis involving panel data types. The analysis used in this study is multiple regression analysis. The sampling technique of this study is purposive sampling with several criteria. The classification in the selection of manufacturing company samples consists of 3 sectors, namely (1) basic industrial and chemical sectors, (2) various industrial sectors and (3) consumer goods industry sectors.

IV. STATISTICAL TEST RESULTS

Table 1 Descriptive Analysis

Description	CAP (X1)	DEB (X2)	FIN (X3)	CED (Y)
Mean	0,0386	0,0392	0,0176	0,5427
Maximum	0,0995	0,1902	0,0922	1,0000
Minimum	0,0000	0,0012	0,0030	0,0556
Std. Dev	0,0241	0,0279	0,0156	0,1974
Observation	207	207	207	207

Based on the descriptive analysis, it is obtained that Capital Expenditure (X1) has an average of 0.0386. This indicates that the average purchase of fixed assets is still relatively low because it is close to the minimum value. The sample with the lowest value of 0.0000 is owned by PT Arkha Jayanti Persada Tbk (ARKA) and PT Eterindo Wahanatama Tbk (ETWA), while the sample with the highest value of 0.0995 is only owned by PT Champion Pacific Indonesia Tbk.

Debt Maturity (X2) shows that the variable Debt Maturity has an average of 0.0392. This indicates that the average manufacturing company has a relatively low Debt Maturity because it is close to the minimum value. The sample with the lowest value of 0.0012 is owned by PT Sekar Bumi Tbk (SKBM), while the sample with the highest value is 0.1902 which is only owned by PT Akasha Wira International Tbk (ADES).

Financial Slack (X3) shows that the variable Financial Slack has an average of 0, this indicates that the average manufacturing company has a relatively high Financial Slack because the average is close to the maximum value. The sample with the lowest value of 0.0030 is owned by PT Mega Perintis Tbk (ZONE), while the sample with the highest value is 0.0922 which is only owned by PT Indofarma Tbk (INAF)

The Carbon Emission Disclosure variable (Y) shows that the Carbon Emission Disclosure variable has an average of 0.5427. This indicates that the average manufacturing company has a relatively high Carbon Emission Disclosure because it is close to the maximum value. The sample with the lowest value of 0.0556 is owned by PT Gunawan Dianjaya Steel Tbk (GDST), while the sample with the highest value of 1 is only owned by 3 companies, namely Astra Otoparts Tbk (AUTO), PT Unilever Indonesia Tbk (UNVR) and PT Steel Pipe Industry of Indonesia Tbk (ISSP)

A. Panel Data Regression Model Estimation

➢ *Common Effect Model*

This model is a simple model that occurs because of the process of combining all data without regard to time (time series) and observation companies (cross section). This approach uses the least squares technique.

➢ *Fixed Effect Model*

The Fixed Effect Model is a model that assumes that differences between observations can be accommodated from differences in interception. In estimating Fixed Effect model panel data using dummy variable techniques aims to capture intercept differences between companies.

➢ *Random Effect Model*

The Random Effect Model (REM) is a model that estimates panel data where interference variables may be interrelated between time and between observations. In this model, the difference in intercepts is accommodated by the error terms of each company.

B. Panel Data Model Selection Test

➢ *Test Chow*

The chow test is used in determining the right model between the common effect and fixed effect models. In this study produced a cross section chi square of 0.0000 or less than 0.05 so that the model selected in this test is a fixed effect model.

- *The Results of the Chow Test can be Seen in Table 2 below:*

Table 2 Chow Test Results

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.814105	(68,135)	0.0017
Cross-section Chi-square	134.358726	68	0.0000

Source: Output E Views Version 12

➢ *Hausman Test*

The Hausman test is used in determining the exact model between the random effect and fixed effect models. In this study produced a cross section probability value of 0.6584 or greater than 0.05, then the selected model has a random effect model.

- *The Results of the Hausman Test can be Seen in Table 3 below:*

Table 3 Hausman Test Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.604229	3	0.6584

Source: Output E Views Version 12

➢ *Lagrange Multiplier Test*

The Lagrange Multiplier test is used in determining the right model between the random effect and common effect models. This Breusch-Pagan probability value produces a number of 0.0025 which is smaller than 0.05 so that the best model in this study is the *Random effect model.*

- *The Results of the Lagrange Multiplier Test can be Seen in the Table 4 following :*

Table 4 Lagrange Multiplier Test Results

Lagrange Multiplier Tests for Random Effects Null hypotheses: No effects Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives			
	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	9.149358 (0.0025)	35.47748 (0.0000)	44.62684 (0.0000)

Source: Output E Views Version 12

C. Test Classical Assumptions

The Normality Test is useful for detecting residual values that are normally distributed or not. This test is performed by prob analysis. Jarque-Bera and the results show that prob. amounted to 0.0850. This result is more than 0.05 which means the data is normally distributed.

The Multicollinearity Test aims to test whether the regression model found a correlation between independent variables. This test produces a correlation value not exceeding 0.80. So that in the regression model it can be said that there is no violation of multicollinearity.

The Autocorrelation Test aims to determine the presence or absence of confounding errors in period t with confounding errors in period t-1. This test using the Breusch-Godfrey Correlation LM test shows that the value of Prob*R-Square is 0.0862 or more than 0.05 so that it can be stated that the data is free from autocorrelation problems.

The heteroscedasticity test aims to determine whether in a regression model there is an inequality of variance from the residual of one observation to another observation. This test uses the white test and the results show the value of Prob. Chi Square of 0.1093 is more than 0.05 So it can be concluded that in this study the data did not contain symptoms of heteroscedasticity.

D. Multiple Linear Regression

In estimating the panel data model, regression analysis of panel data can be carried out which has a confidence level of 95%. Multiple linear regression analysis testing aims to see if the independent variable has an influence on the dependent variable. The results of the multiple linear regression analysis test with the selected model, namely the random effect model, are presented in table 5 below:

Table 5 Multiple Linear Regression Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.440757	0.037845	11.64629	0.0000
CAP	1.301821	0.655017	1.987461	0.0482
DEB	0.253601	0.509059	0.498176	0.6189
FIN	2.375614	0.947841	2.506342	0.0130
Effects Specification			S.D.	Rho
Cross-section random			0.090728	0.2230
Idiosyncratic random			0.169348	0.7770
Weighted Statistics				
R-squared	0.090528	Mean dependent var		0.397793
Adjusted R-squared	0.077088	S.D. dependent var		0.175672
S.E. of regression	0.168765	Sum squared resid		5.781752
F-statistic	6.735511	Durbin-Watson stat		1.820659
Prob(F-statistic)	0.000236			
Unweighted Statistics				
R-squared	0.076287	Mean dependent var		0.542673
Sum squared resid	7.414989	Durbin-Watson stat		1.419638

➢ *In Accordance with the Processing Results in Table 6, the Regression Equation Obtained in this Study is:*

Y = 0.4408 + 1.3018*CAP + 0.2536*DEB + 2.3756*FIN

➢ *Information:*

- Y = Carbon Emissions Disclosure
- STAMP = Capital Expenditure
- DEB = Debt maturity
- FIN = Financial Slack

The regression equation model is able to show the influence of independent variables on carbon emission disclosure variables. The result of the equation is obtained by 0.4408 which means that carbon emission disclosure will be 0.4408 if the variables Capital Expenditure, Debt Maturity and Financial slack are equal to zero or constant.

The variable coefficient of Capital Expenditure (X1) is 1.3018. If the value of the other variable is constant and the CAP variable increases by 1%, then variable Y will increase by 130.18%. vice versa, if the value of other variables is constant and the CAP variable decreases by 1%, then variable Y will decrease by 130.18%.

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The variable coefficient of Debt Maturity (X2) is 0.2536. If the value of the other variable is constant and the DEB variable increases by 1%, then variable Y will increase by 25.36%. vice versa, if the value of other variables is constant and the DEB variable decreases by 1%, then variable Y will decrease by 25.36%.

The coefficient of the Financial Slack variable (X3) is 2.3756. If the value of the other variable is constant and the FIN variable has increased by 1%, then variable Y will experience an increase of 237.56%. vice versa, if the value of other variables is constant and the FIN variable decreases by 1%, then variable Y will decrease by 237.56%.

E. Hypothesis Testing

➢ *Statistical Test t*

The t test is performed to test the effect between the independent variable on the dependent variable which is carried out separately. This t-test has a significance value of 0.05. The results of the t-test can be seen in table 6.

Based on the results of the t test on the Capital Expenditure variable (X1) shows the value of prob. At 0.0482 this value is smaller than the expected significant level (0.0482<0.05). This shows that Capital Expenditure has an influence on carbon emission disclosure.

The results of the t test on the variable Debt Maturity (X2) show the value of prob. At 0.6189 this value is greater than the expected significant level (0.6189>0.05). This shows that Debt Maturity has no influence on carbon emission disclosure.

The results of the t test on the Financial Slack variable (X3) show the value of prob. At 0.0130 this value is smaller than the expected significant level (0.0130<0.05). This shows that Financial Slack has an influence on carbon emission disclosure.

F. Statistical Test f

The f test is used to test whether the regression model is feasible for use in research. The results of statistical tests show that the statistical F probability of 0.0002 or less than 0.05 means that Capital Expenditure (X1), Debt Maturity (X2) and Financial Slack (X3) simultaneously have a significant influence on carbon emission disclosure.

G. Coefficient of Determination Test

The coefficient of determination (R^2) is used to measure how far the model is able to explain the dependent variable. In table 6 it is stated that the coefficient of determination is 7.71%. The remaining 92.29% is influenced by other factors.

V. RESULTS AND DISCUSSION

A. The Effect of Capital Expenditure on Carbon Emission Disclosure

Based on the test results, this study listed in table 5 results in that the Capital Expenditure (X1) variable has a positive influence on carbon emission disclosure. This means that if there is an increase in the value of Capital Expenditure, the company will present a more complete carbon emission disclosure report.

This happens because companies that choose to increase production capacity with a strategy that purchases more production equipment will leave a higher carbon footprint and have an impact on environmental pollution. The use of technology with renewable energy has a lower impact on carbon residue than using renewable energy technology (Irwhantoko &; Basuki, 2016). To ensure this, stakeholders put pressure on companies to disclose carbon emissions generated from the purchase of fixed assets.

This research is in line with research conducted by (Karim et al., 2021) (Sulfitri et al., 2023) (Ratmono et al., 2021) which also states that the purchase of capital expenditure has a positive effect on carbon emission disclosure.

B. The Effect of Debt Maturity on Carbon Emission Disclosure

Based on the results of testing conducted in this study listed in table 5 resulted that the variable Debt Maturity (X2) has no influence on carbon emission disclosure. This happens because debts that have maturities of more than one year have a risk of default due to too long maturities and pressure by creditors so that the company always has funds to pay its obligations. So the company is required to have high sales to be able to guarantee to lenders that funds are always available to pay maturing debts.

Debt maturity is a tool for the company's debt structure to fund operational and investment needs. So that management is more likely to focus on being able to pay its debts as a priority in supporting its business sustainability rather than only disclosing carbon emissions that do not directly support the sustainability of the company's business.

This research is in line with research (Fransiska & Triani, 2017) (Azani et al., 2019) (Ikhsan &; Septiana, 2019) Az Zahra &; the Aryati Point (2023) Dipasti & Sulistyowati (2022) Wahyuningrum et al., (2022) which states that debt maturity has no relationship with carbon emission disclosure.

C. Financial Slack's Impact on Carbon Emissions Disclosure

Based on the results of testing conducted in this study listed in table 5 resulted in that the Financial Slack variable (X3) has a positive influence on carbon emission disclosure. This means that if there is an increase in the

value of Financial Slack, the company will present a more complete carbon emission disclosure report.

This happens because companies that develop their business continuity will pay attention to an increase in sales. This increase in sales can predict the amount of profit in the future (Setiawan &; Mappanyukki, 2023). An entity's profits can be converted into cash or cash equivalents that become financial resources. These financial resources are useful for adjusting to take corporate development steps that have a broad impact on the company such as environmental disclosure. This allocation can be in the form of developing employee training to be aware of energy savings, purchasing renewable energy fixed assets and green investments oriented towards corporate sustainability.

Berdasarkan results of this study in line with research conducted by (Aini et al., 2022) (Elbanna & Abdel-Maksoud, 2020) (Nature & Islam, 2022) (Anam &; Utami, 2022) (Kristin Tiara Pita Napitu, 2021) (Hasanah et al., 2019) (Allam &; Diyanty, 2020) which states that Financial Slack is positively related to carbon emission disclosure.

VI. CONCLUSION

➢ *Based on the Results of research and Discussion in the Previous Chapter, the Conclusions of this Study are as Follows:*

- Capital expenditure and Financial Slack positively affect carbon emissions disclosure.
- Debt Maturity has no influence on carbon emission disclosure.
- Capital Expenditure, Debt Maturity and Financial Slack are model-fit tested or simultaneously have a significant effect on carbon emissions disclosure.

➢ *There are Several Suggestions for Several Related Parties from the Results of this Study, Namely:*

- To the company, especially for the company to always not only focus on goals that benefit the company but also focus on broader aspects, namely by paying attention to the environment. Companies are advised to exercise control over the ownership of fixed assets by taking into account the impact of the use of their assets on the environment. Furthermore, the Company is also advised to pay debts on time according to agreed commitments and control its carbon emissions. Furthermore, it is also recommended to companies that have excess financial resources to continue to optimize more complete disclosure of carbon emissions and contribute to various environmental control activities.
- To researchers who will conduct similar research to use carbon emission measurements with other proxies such as the International Standard Organization (ISO) or Global Reporting Initiative (GRI) proxies to be more comprehensive. As well as adding other independent variables that can explain a larger portion of the influence of free variables on carbon emission disclosure variables
- To the government to always enrich regulations that can provide firmness to companies to continue to control emissions produced through carbon emission delivery rules that must be disclosed by all companies transparently in order to preserve the earth. The formulation of this policy can also be in the form of incentives given to companies that have ownership of fixed assets with renewable energy that produces low-carbon emissions, provide low-interest rate incentives to companies that have complete carbon emission disclosure and optimize carbon trading.

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