





(2013) and Jannah and MUI (2014), Hermawan et al (2018). Based on these considerations, the following hypothesis was formulated.

H2: Profitability has a significant effect on carbon emission disclosure.

### Effect of Leverage on Carbon Emission Disclosure

Stakeholder theory states that the higher the leverage of the company, the greater the company's responsibility to creditors, forcing companies to use available sources of funds to pay off these debts rather than to disclose carbon emissions because disclosing will result in greater costs and can be a burden for company (Choi, et al 2013). Luo et al (2013) argue that companies with high leverage have little funds to implement a proactive carbon reporting system because of their large debt burden. In developing this hypothesis, there is a negative direction between the level of leverage and the level of disclosure of carbon emissions. The higher leverage the company, the lower the disclosure of carbon emissions, and vice versa, the smaller the company's leverage, the greater the disclosure of carbon emissions. Research conducted by Luo, et al (2013) and Zhang, et al (2013) found that leverage affects the disclosure of carbon emissions.

The description above is supported by the results of research by Bhorgei-Ghomi and Leung (2013), Lou et al (2013), Zhang et al (2013) and Jannah and Muid (2014) which state that leverage affects the disclosure of carbon emissions. On the basis of the above considerations, the following hypothesis is formulated.

H3: Leverage has a significant effect on disclosure of Carbon Emissions

### Effect of Type of Industri on Carbon Emission Disclosure

In legitimacy theory, carbon intensive companies tend to get greater pressure from the community so that the company must provide carbon disclosure reports to match demands and get legitimacy from the community. Research conducted by Choi, et al (2013), and Jannah and Muid (2014) found evidence that the type of industry has an effect on the disclosure of carbon emissions. Based on the explanation above, the following hypothesis is formulated.

H4: Type of industry affects the disclosure of carbon emissions.

## METHOD

### Research Variable

In this study, Carbon Emission Disclosure was measured using several items adopted from the research of Choi et al (2013). To measure the extent of carbon disclosure, Choi et al developed a checklist based on the information request sheet provided by the CDP (Carbon Disclosure Project). Choi et al defined five broad categories relevant to climate change and carbon emissions. Within these five categories, 18 items were identified. The following is a checklist for carbon emission disclosure:

**Tabel 1**  
**Carbon Emission Disclosure Checklist**

<b>Climate Change: risks and opportunities</b>	CC1- Assessment/description of the risks (regulatory, physical or general) relating to climate change and actions taken or to be taken to manage the risks
	CC2- Assessment/description of current (and future) financial implications, business implications and oportunities of climate change
<b>GHG Emission</b>	GHG1- Description of the methodology used to calculate GHG emissions (e.g. GHG protocol or ISO)
	GHG2- Existence external verification of quantity of GHG emission- if so by whom and on what basis
	GHG3- Total GHG Emissions – metric tones CO <sub>2</sub> -e emitted
	GHG4- Disclosure of scopes 1 and 2, or scope direct GHG emissions
	GHG5- Disclosure of GHG emissions by sources (e.g. coal, electricity, etc.)
	GHG6- Disclosure of GHG emissions by facility or segment level
	GHG7- Comparison of GHG emissions with previous years
<b>Energy Consumption</b>	EC1- Total energy consumed (e.g. tera-joules or peta-joules)
	EC2- Quantification of energy used from renewable sources
	EC3- Disclosure by type, facility or segment
<b>GHG Reduction and-Cost</b>	RC1- Detail of plans or strategies to reduce GHG emissions
	RC-2- Specification of GHG emissions reduction target level and target year
	RC3- Emissions reductions ad associated costs or savings
	RC4- Cost of future emissions factored into capital expenditure planning
<b>Carbon Emission Accountability</b>	AEC1- Indication of which board committee (or other executive body) has overall responsibility for actions related to climate change
	AEC2- Description of the mechanism by which the board (or other executive body) reviews the company's progress regarding climate change

Source: Choi et al (2013)

The calculation of the carbon emissions' disclosure index is carried out by the following steps: Giving a score for each item of disclosure with a dichotomy scale is in line with research conducted by Choi et al (2013), Jannah and Muid (2014) and Hermawan et al (2018). The maximum score is 18, while the minimum score is 1. Each item has a value of 1 so that if the company discloses all the items in the information in its report, the company's score is 18. The scores for each company are then added up.

Company size is measured from the company's total assets. Profitability is measured by using ROA (Return on Assets). Leverage is measured using the DER (debt to equity ratio). Type Industry is measured using a dummy variable where the value of 1 for the company is included in industries that are intensive in producing emissions (Firms in emission intensive industries) which includes energy, transportation, raw materials (materials) and utilities based on Global Industry Classification Standard (GICS), while the value 0 is the opposite.

### Sample Determination

The population in this study is non-financial companies listed on the Indonesia Stock Exchange. The sample in the study was determined using a sampling technique. The technique used in this research is purposive sampling technique. The criteria set in determining this sampling are:

1. Non-financial companies listed on the IDX for the 2017-2019 period.
2. Non-financial companies that provide financial reports or sustainability reports for the 2017-2019 period.
3. Companies that explicitly disclose carbon emissions (covering at least one policy related to carbon / greenhouse gas emissions or disclosing at least one emission disclosure item).

### Analysis Method

The data that has been collected were analyzed using statistical analysis tools, namely multiple regression analysis with the equation model as following:

$$CE\_Disc = \alpha + \beta_1Size + \beta_2Pro + \beta_3Lev + \beta_4Tipe + e$$

Explanation

CE\_Disc = Carbon Emission Disclosure

$\alpha$  = Constanta

$\beta_1 - \beta_4$  = regression Koefisien

$\beta_1Size$  = company size

$\beta_2Pro$  = Profitability

$\beta_3Lev$  = Leverage

$\beta_4Tipe$  = Type of industri

e = error

## RESULT AND DISCUSSION

### Research Sample Description

This research was conducted on companies listed on the Indonesia Stock Exchange (IDX) for three years in the 2017-2019 period, sourced from the company's annual report or sustainability report through the website [www.idx.co.id](http://www.idx.co.id) and the company's official website. This study uses purposive sampling technique, which is a sampling technique with certain considerations. The focus of this research is on companies that meet the sample selection criteria, which can be seen in the table below:

**Tabel 2**  
**Criteria Sample**

Explanation	total
Non-financial companies listed on the IDX for the 2017-2019 period	578
Companies that provide annual reports / sustainability reports for the 2017-2019 period.	543
The total number of companies that do not disclose explicitly disclosing information about carbon emissions in their annual / sustainability reports.	(503)
Research sample based on criteria	40

Source: Secondary data processed, 2020

Descriptive statistics in this study are presented in the table below. The table shows that 120 reports, both annual and sustainability reports, were studied in this research period (2017-2019).

**Tabel 3**  
**Descriptive Statistic**

Variabel	N	Minimum	Maksimum	Mean	Std. Deviation
Company Size	120	28,717	33,495	30,89097	1,046411
Profitability	120	-0,286	0,447	0,06588	0,090962
Leverage	120	0,145	7,036	1,18938	1,192345
Type of Industri	120	0,000	1,000	0,92500	0,264496
CED	120	1	16	7,89	3,69

Source: Secondary data processed, 2020

Based on table 3, it can be seen that the maximum value of the company size variable is 33.495 which comes from PT Astra International while the minimum value is 28.717 owned by PT Total Bangun Persada. While the average value of the company size variable is 30.89097 with a standard deviation of 1.046411.

Based on table 3 it can be seen that the maximum value of the variable profitability of 0, 447 from PT Unilever while the minimum value of -0.286 is owned by PT Bumi Resources. While the average value of the profitability variable is 0.06588 with a standard deviation of 0.090962.

Based on table 3 it can be seen that the maximum value of the variable leverage of 7,036 which comes from PT Tower Bersama Infrastruktur while the minimum value of 0, 145 is owned by PT Vale Indonesia. While the average value of the leverage variable is 1.18938 with a standard deviation of 1.192345.

Based on table 3 it can be seen that the maximum value of the variable type of industry is 1, while the minimum value is 0. While the average value of the industrial type variable is 0.92500 with a standard deviation of 0.264496.

Based on table 3 it can be seen that the maximum value of the variable disclosure of carbon emissions of 16 items from PT Indocement Tunggul Prakasa while the minimum value of 1 item is owned by PT Indo Tambangraya Megah and PT Telekomunikasi Indonesia. Meanwhile, the average value of the carbon emission disclosure variable is 7.89 with a standard deviation of 3.69.

## Discussion of Research Results

The results were tested by using multivariate analysis using regression analysis multiple linear. A clearer picture of the regression results will be described in table 4.

**Table 4**  
**Summary of Hypotheses Testing**

Variable	Unstandardized Coefficients	Sig ( $\alpha = 5\%$ )
(Constant)	-22.852	.015
Company Size	.913	.003
Profitability	-4.520	.217
Leverage	-.625	.045
Type of Industri	3.789	.005

Source: Secondary data processed, 2020

From the results of the above calculations, it can be concluded that 4 (four) independent variables influence on ECD, namely: company size (X1), Leverage (X3), type of industry (X4); and 1 (one) The independent variable has no effect on the ECD variable, namely Profitability (X2). Based on table 4, concluded the mathematical equation as follows:

$$CED = -22.852 + 0.913 \text{ Company Size} - 0.625 \text{ Leverage} + 3.789 \text{ Type of Industry} - 4.520 \text{ Profitability}$$

Based on the spss output, company size has a positive effect on carbon emission disclosure. The results of this study are in accordance with the legitimacy theory that large companies will be the main focus of society, because the activities carried out by the company have an impact on the environment. So that large companies get greater public pressure to show their environmental social responsibility than small companies. The results found in this study are in line with several previous studies such as Choi et al (2013), Lou et al (2013) and Hermawan et al (2018). Larger companies are encouraged to provide quality voluntary disclosures to gain legitimacy.

Based on the spss output, ptofitability doesn't have effect on carbon emission disclosure. The results of this study are not in

accordance with the research results of Jannah and Muid (2014) and Nisak and Yuniarti (2018) but support the research of Choi et al. (2013), Luo et al. (2013), Eleftheriadis and Anagnostopoulou (2014). The difference between the results of this study and those of Jannah and Muid (2014) can be due to the nature of the sample used. The companies that are the samples of Jannah and Muid's (2014) research are companies listed on the Indonesia Stock Exchange (IDX), 35 companies were observed in 2010, and 37 companies were observed in 2011 and 2012. The description of the research sample shows a mean profitability of 11.13 is greater than the standard deviation of 9.34, the mean value of carbon emission disclosure is 7.49, which is greater than the standard deviation of 3.42, which means that the companies studied have a high profit on average and disclose quite a lot of carbon emissions, especially when involve high profile companies such as mining companies which of course have higher profits and pressure on the environment. The difference between the results of this study and previous research can be caused by the nature of the companies being sampled in this study, namely there are companies that have the highest profitability but do not broadly convey carbon emission disclosures and there are companies that have low profitability but convey more carbon emission disclosure points. So it can be said that the amount of profitability does not move along with disclosure of carbon emissions. The insignificance of the profitability function on the disclosure of carbon emissions because the benefits and costs of disclosure are not relevant.

Based on the spss output, leverage has a negative effect on carbon emission disclosure. The results of this study are in accordance with stakeholder theory which states that the higher the leverage of the company, the greater the company's responsibility towards creditors, forcing the company to use available sources of funds to pay off these debts rather than to disclose carbon emissions because disclosing it will result in greater costs and can be a burden for the company (Choi, et al 2013). The results found in this study are in line with several studies by Bhorgei-Ghomi and Leung (2013), Lou et al (2013), Zhang et al (2013) and Jannah and Muid (2014), Nisak and Yuniarti (2018), Hermawan et al. (2018) which states that leverage affects the disclosure of carbon emissions.

Based on the spss output, type of industry has a positive effect on carbon emission disclosure. The results of this study are in accordance with the theory of legitimacy, carbon-intensive companies tend to get greater pressure from the community so that companies must provide carbon disclosure reports in order to comply with demands and gain legitimacy from the community. The results found in this study are in line with several previous studies such as Choi et al (2013) that companies that are more intensive in producing carbon from their operational activities have an effect on the disclosure of carbon emissions. Likewise, the research that has been conducted by Jannah and Muid (2014), the type of industry affects the disclosure of carbon emissions, and the companies that most disclose are companies engaged in mining, manufacturing and agriculture.

## CONCLUSION

Based on the analysis and discussion that has been carried out using a sample of 40 companies listed on the Indonesia Stock Exchange the 2017-2019 then the following conclusion can be drawn:

1. Company size has a significant effect on carbon emission disclosure in non-financial companies in Indonesia. Thus, large companies are more encouraged to provide voluntary quality disclosures to gain legitimacy and disclose detailed information related to pollution.
2. Profitability has no significant effect on disclosure of carbon emissions in non-financial companies in Indonesia. This means that the level of profitability does not affect the level of disclosure of carbon emissions by the company.
3. Leverage has a significant effect on the disclosure of carbon emissions in non-financial companies in Indonesia. The higher the leverage of the company, the smaller the company will disclose its carbon emissions because the company prioritizes its responsibilities to creditors.
4. Type of industry affects the disclosure of carbon emissions (carbon emission disclosures) in non-financial companies in Indonesia. Companies that are intensive in producing carbon such as energy, transportation, materials and utilities tend to disclose information related to environmental aspects compared to companies that are not intensive in producing carbon from their operational activities such as financial companies.

## IMPLICATION & LIMITATION

The theoretical implication, this research is a form of theory development which is the theoretical basis of this research. The results of this study can provide benefits in the form of additional literature / research references regarding the effect of company size, profitability, influence and type of industry on carbon emission disclosures. This research can be used as reference material for further research.

Practical research implications, the results of this study can Investors are used, brokers and capital market analysts as a consideration in making the right investment in companies that care more about the environment in order to preserve nature. This is due to the problem of climate changes, global transactions have become an increasingly widespread issue and have attracted international reactions. So that by prioritizing investment in environmentally friendly companies, it will be able to increase the number of companies that care more about nature, more and more environmentally friendly products will be produced, and in the end the balance between the three basic pillars of business which includes profit, society, and the planet is achieved.

This study has limitations in conducting research such as there are several other variables that have not been included in this

study that affect the disclosure of carbon emissions. and the research method used in the form of an index developed by Choi et al. (2013) based on a request sheet obtained from the Carbon Disclosure Project (CDP). With these limitations, it is hoped that further research can improve these limitations. First, Adding variables that can explain the effect of the effect on the extent of disclosure of carbon emissions in companies in Indonesia such as carbon emission levels, quality of corporate governance, media exposure, environmental performance and so on. Second, the researchers can then develop measurements for disclosure of carbon emissions in accordance with conditions in Indonesia and to avoid the subjectivity of researchers in assessing the extent of disclosure of carbon emissions.

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