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Does Board Capital Improve Climate Change Disclosures?

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ABSTRACT

Climate change is a global issue faced by many countries that cause enormous damage. This is the biggest challenge for a sustainable economy so firms have to mitigate the risk of climate change. Climate change disclosures can be a way for firms to gain legitimacy from stakeholders. The purpose of the study is to examine the effect of board capital on climate change disclosures. This study consists of 191 firm-year observations of banks listed on the Indonesia Stock Exchange from 2016-2020. Data were obtained from annual reports, sustainability reports, and company websites and were analyzed using regression. The results of the study show that board capital has a positive effect on climate change disclosures. This study examines the dimensions of board capital separately too consisting of networking, education, and experience owned by the board on climate change disclosures. The result shows that networking, education, and experience of the board have a positive effect on climate change disclosures. The board plays a significant role in disclosing information about climate change, so companies need to pay attention to the quality of the board. The board's extensive network, higher education, and background experience will increase climate change disclosures.

Keywords: climate change disclosures; board capital; board networking; board education; board experience.

1. INTRODUCTION

Climate change is a global issue faced by many countries because it threatens the existence of humans and other living things. The existence of climate change results in extreme weather changes that cause enormous damage in various countries which also have an impact on business activities. In an external press release, the United Nations Framework Convention on Climate Change (UNFCCC) stated that the increase in global carbon emissions of more than 2 billion tons by 2021 was the largest in history. This is the biggest challenge for a sustainable economy, both financial and reputational challenges that companies must address. The long-term impact of climate change has attracted the attention of the governments of 196 countries that have agreed to sign an international agreement on climate change, known as the Paris Agreement.

Countries that signed the Paris Agreement agreed to contribute to reducing global temperature increases by limiting global temperatures to below 2°C or even up to 1.5°C (United Nations, 2015).

In Indonesia, Financial Services Authority has prepared a Sustainable Finance Roadmap to support solving problems caused by climate change. In the Sustainable Finance Roadmap, there is a green taxonomy component which is a classification of business sectors that support environmental protection and management efforts as well as mitigation and adaptation to climate change. Based on the Regulation of Financial Services Authority NO. 51/POJK.03/2017 Article 4(1), financial service institutions are required to prepare a Sustainable Finance Action Plan which is a written document containing the financial industry strategy to implement activities that harmonize economic, social, and environmental aspects. Banks also contribute to the fight against climate change through the use of electronic documents (paperless), water and electricity efficiency (green building), as well as financing environmentally friendly projects (green investing).

Climate change affects business so companies need to adapt and make efforts to reduce risks that may occur (Iriyadi & Antonio, 2021). Businesses can be affected by forest fires, lack of clean water, deteriorating agricultural production, damaged resources, increased risk of infectious disease outbreaks, and also have an impact on economic activity (Ahzar, 2018). Companies are expected to prove that they are careful about environmental pollution and work responsibly to reduce carbon emissions that can trigger climate change (Ahmad & Hossain, 2015). Therefore, many companies in various countries express their views and activities related to climate change issues in annual reports, websites, and sustainability reports (Ahzar, 2018). Companies that contribute to carbon emissions and do not make efforts to overcome them will suffer consequences such as reputation risk, reduced demand, increased operational costs, and fines (Berthelot & Robert, 2011). Companies are under pressure from stakeholders to disclose information related to company activities that affect climate change (Daradkeh et al., 2022). Stakeholders, especially investors, want to know not only how much carbon emissions are issued, but also how the company evaluates the risks, financial

impacts, and whether there is a control system related to carbon emissions. Creditors also consider information related to environmental issues to make funding decisions (Kim et al., 2021).

Previous studies examine the factors that can affect climate change disclosures. Climate change disclosures will be made by companies with good corporate governance (Choi et al., 2013; Daradkeh et al., 2022); larger board size (Ahzar, 2018; Asare et al., 2022; Nasih et al., 2019); the percentage of the number of female boards (Al-Qahtani & Elgharbawy, 2020) and well-known boards (celebrity board) (Shui & Zhang, 2020). Climate change disclosures can also be influenced by the board's background such as education and board experience (Reeb & Zhao, 2013; Brahmna et al., 2019; Elsayih et al., 2021). This study uses companies in Indonesia as a sample with board capital as a factor that is thought to increase climate change disclosures.

The board of the company has the task of overseeing material risks that may be faced by the company and ensuring the identification of these risks is accompanied by risk management. Board groups with a range of abilities, experience, and knowledge are able to initiate strategic change by assessing threats, evaluating alternatives, and making better decisions (Pan et al., 2020). An effective board will seek to reduce the risk of climate change and respond to stakeholder expectations by increasing disclosure related to climate change (Ben-Amar & McIlkenny, 2015). The risks arising from climate change are also opportunities for companies to develop renewable energy sources, introduce low-carbon products, and support customers to manage carbon emissions.

This study aims to examine the effect of board capital on climate change disclosures. In addition, this study examines the dimensions of board capital separately consisting of networking, education, and experience owned by the board on climate change disclosures. This research contributes by providing benefits to the literature on how board capital can increase the disclosure of non-financial information of companies. With climate change as a global issue, this research provides information for regulators to encourage companies to reduce carbon emissions.

In the next section, this study will present a literature review followed by the development of hypothesis. Section 3 describes the sample and research methodology. Section 4 discusses the results. Section 5 is the conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Board capital and climate change disclosures

The risks arising from climate change will continue to increase from time to time so investors have the right to get information on how the company is dealing with this reality and how the business opportunities from climate change are. This means that the company's response to climate change and environmental degradation is becoming increasingly important (Aggarwal & Dow, 2012). If the company is not able to provide information, there will be a risk that the public will make an assessment of the company based on inaccurate information (Haque & Deegan, 2010). Risks and opportunities related to climate change can be material for companies so the Task Force on Climate-related Financial Disclosures (TCFD) encourages companies to start disclosing financial information related to climate. TCFD provides a framework to help companies create reports to convey information related to climate change.

Theories that can explain the relationship between board capital and climate change disclosures are legitimacy theory and stakeholder theory. The company has contracts with stakeholders as well as with the wider community through the interactions that occur. Companies have rights and authority from the community to access resources (Choi et al., 2013). Because these resources are important for survival, companies must ensure to operate within the boundaries and norms prevailing in society to convince stakeholders that the company is legitimate (Berthelot & Robert, 2011). Climate change disclosures can be a way for companies to gain legitimacy. Companies must pay attention to their activities so as not to cause harm to the community. Every bad action of the company can be a legitimacy gap that can harm the company (Ahmad & Hossain, 2015). Companies exist not only to pay attention to the interests of the company but also to provide benefits to stakeholders. Companies as going-concern entities need resources that can be obtained from stakeholder support to

be able to continue operating (Nasih et al., 2019). With the issue of climate change, companies get pressure from stakeholders to convey information related to climate change (Ahzar, 2018). Disclosure is a form of communication between companies and stakeholders because the company management has more information than the stakeholders (Kurnia, et al., 2021). Legitimacy theory and stakeholder theory are complementary theories.

The board is the highest level in the company management and is also a valuable asset for the company. The board of directors in the company functions to monitor management and provide the resources needed by the company such as advice and suggestion on strategic issues (Ricci et al., 2019) and serves to increase the trust and wealth of shareholders (Brahmana et al., 2019). Meanwhile, the board of commissioners functions to oversee the board of directors in managing the company (Rusli et al., 2020). Board capital is a factor considered by stakeholders because the board is chosen and entrusted to run the company. Stakeholders will benefit if the company has better resources and can also reduce agency costs (Kontesa et al., 2020).

Companies with wider board capital coverage will respond to climate change and allow higher disclosures (Shui & Zhang, 2020). Hillman and Dalziel (2003) interpret board capital as human and social capital owned by the company's board. Human capital includes a range of capabilities and knowledge such as educational background and work experience. While social capital includes potential resources that come from business networks or relationships owned by a person. Boards with high capabilities will maintain their reputation by reducing information asymmetry. The board's experience, education, and business network enable the disclosure of higher-quality information (Reeb & Zhao, 2013). One of the important tasks of the board is to make a policy regarding the company's disclosures.

Companies that can manage assets efficiently will be increasingly encouraged to disclose information because they have optimism and a good reputation (Ariantika & Geraldina, 2019). The board's experience which includes new ways of thinking, beliefs, concepts, and ideas has an impact on the company's strategic decisions including actions in managing risks related to climate change (Elsayih et al., 2021). In

their research, Reeb & Zhao (2013) stated that board capital increases governance efficacy with higher quality disclosures as well. Information in disclosures is needed by stakeholders so that management who can use their abilities, knowledge, and experience is needed to develop and implement business strategies that satisfy stakeholders (Ng & Daromes, 2016). Therefore, this study proposes the following hypothesis:

H₁: Board capital has a positive effect on climate change disclosures.

3. RESEARCH METHOD

Data and sample

This study uses data obtained from annual reports, sustainability reports, and company websites. The object of research is the banking companies listed on the Indonesia Stock Exchange (IDX) from 2016 to 2020 as many as 47 banks. After excluding unique factors from 47 banks, the final sample of this study is 191 firm-year observations.

Variable measurement

Climate change disclosures are measured using an index provided by TCFD. The TCFD recommendations cover four dimensions, namely Governance, Strategy, Risk Management, and Metrics and Targets. Each item in the index disclosed by the company will be given a score of 1, otherwise given a score of 0. With this scoring method, the maximum value that will be obtained by each company is 11, with a minimum value of 0. Previous research using the TCFD index as a climate change disclosures measurement are by Eccles and Krzus (2017), Bose and Hossain (2021), and Achenbach (2021).

GOVERNANCE	1) Describe the board’s oversight of climate-related risks and opportunities.
	2) Describe management’s role in assessing and managing climate-related risks and opportunities.

STRATEGY	1) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.
	2) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.
	3) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.
RISK MANAGEMENT	1) Describe the organization's processes for identifying and assessing climate-related risks.
	2) Describe the organization's processes for managing climate-related risks.
	3) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.
METRICS AND TARGETS	1) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
	2) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	3) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

Measurement of board capital follows the method Reeb & Zhao (2013) with three dimensions: networking, education, and experience. Another research that uses the method of Reeb & Zhao (2013) is the research of Kontesa et al., (2020) and Brahmana et al., (2019). In this measurement, the education dimension uses measurements from Brahmana et al., (2019). Each level of education is represented by a number from 1 to 9, namely: 1) Under a bachelor's degree; 2) Bachelor's degree; 3) MBA degree; 4) Master's degree; 5) Doctoral degree; 7) Best 200 undergraduate degrees based on QS University rankings; 8) Top 200 master's degrees based on QS University ranking; and 9) Best doctoral degree based on QS University ranking. The board capital calculation procedure uses ranking and average value. Each company will be given a score based on three dimensions of board capital. Then the company will be

ranked based on this score from year to year. Finally, the rankings are summed and averaged per dimension. Board capital is the average value of the three dimensions.

Networking of the Board	Educational of the Board	Experience capital of the Board
1. Total current number of boards a director sits on during a given year.	1. Total number of director that obtain bachelor's degree, master's degree, law degree or medical degree, as well as a PhD degree.	1. Working history: the number of directors who have been a partner in a law firm; have investment bank/venture capital firm expertise; management consulting experience; accounting firm expertise; academic experience.
2. Total current number of nonprofit boards a director sits on		2. Director information on professional certification such as CPA, CFA or certified fraud examiner.
3. Total number of corporate board memberships / the total number of commissioners		3. Number of positions higher than vice president (Chemmanur&Paeglis, 2005) that directors have held during their lifetime.
4. Number of non-profit boards that a director has served on in the past but is no longer a current member / the total number of independent commissioners		4. count the number of firms with which the directors have worked during their lifetime.
5. Any current or prior government position		5. Others potential director characteristic such as national level honours and awards and membership in professional or industrial association affiliations.

This study uses 5 control variables, namely firm size, profitability, leverage, firm age, and audit firm. Large companies are expected to have better resources where

management can identify risks and opportunities related to climate change and be able to provide the information needed by stakeholders (Ararat & Sayedy, 2019). Firm size is measured using the natural logarithm of the company's total revenue. Companies with high profitability (ROE) are expected to be able to manage their resources with due regard to environmental issues (Daradkeh et al., 2022). Companies with high levels of leverage tend to be pressured by stakeholders to disclose information in order to manage reputational and legitimacy risks (Bui et al., 2020). Leverage is measured by the ratio of debt to total equity. The greater the age of the company, the higher the disclosure related to climate change because the reputation and environmental and social responsibility of the company will be increasingly formed over time (Kılıç & Kuzey, 2019). Firm age is measured by the number of years since the company was founded. The dummy variable is used to indicate whether a company is audited by the big four audit firm or not. Companies audited by the big four are encouraged to disclose more information (Ding et al., 2021).

The regression model

The regression model used to test hypothesis 1 (H_1) is:

$$CCD_{it} = \alpha + \beta_1 BC_{it} + \beta_2 SIZE_{it} + \beta_3 ROE_{it} + \beta_4 LEV_{it} + \beta_5 AGE_{it} + \beta_6 AUDIT_{it} + \varepsilon$$

Where CCD = Climate Change Disclosures; BC = Board Capital; SIZE = Firm Size; ROE = Profitability ratio as measured by ROE; LEV = Leverage ratio as measured by DER; AGE = Firm Age; AUDIT = big four audit firm or non-big four audit firm

4. RESULTS AND DISCUSSION

Descriptive statistics

The results of the descriptive statistical analysis are shown in table 1. The independent variable board capital (BC) has an average value of 1.8890 with a maximum value of 4.4667 and a minimum value of 1. The average value of climate change disclosures (CCD) is 2.6649 which shows that among companies in the sample, there are still many who have not fully disclosed information related to climate change with a maximum value of 11 and a minimum of 0. For control variables, the average

firm size value is 27.7199 with a maximum value of 32.0341 and a minimum of 23.1657, thus the sample of this study is large companies. The company's performance can be seen from the profitability ratio with an average value of 2.2893 and a maximum and minimum value of 33.6092 and -54.7039, respectively. The sample company can settle its financial obligations with average leverage of 5.2299 from a maximum value of 14.7485 and a minimum value of 0.0553. The maximum age of the sample company is 125 years and the minimum age is 18 years with an average value of 46.5969. The companies in this research sample were audited by both big four and non-big four audit firms with an average score of 0.5497, a maximum score of 1 (big four), and a minimum of 0 (non-big four). In table 2, there are 54.97% of companies audited by big four audit firm, and 45.03% audited by non-big four audit firm.

Table 1. Descriptive statistics

Variable	N	Mean	Std. Dev	Max	Min
CCD	191	2.6649	2.8121	11	0
BC	191	1.8890	0.7953	4.4667	1
NETWORKING	191	2.0471	0.7518	4.8000	1
EDUCATION	191	2.0366	1.1760	5	1
EXPERIENCE	191	1.5832	0.6022	4	1
SIZE	191	27.7199	1.9774	32.0341	23.1657
ROE	191	2.2893	12.1861	33.6092	-54.7039
LEV	191	5.2299	2.5929	14.7485	0.0553
AGE	191	46.5969	23.0425	125	18

Information: **CCD** = Climate change index disclosed by the company; **BC** = Average value of networking, education, and experience board; **SIZE** = Company size; **ROE** = Return on Equity; **LEV** = Leverage; **AGE** = Age of the company since it was founded.

Table 2. Descriptive statistics for dummy variable

Variable	Freq (1)	Freq (0)
AUDIT	54.97%	45.03%

Note: **AUDIT** = dummy variable, 1 if the company is audited by big four audit firm and 0 otherwise.

Regression results

In this study, the estimation model used is the random effect model and does not require a classical assumption test. As shown in table 3, board capital has a positive effect with a coefficient value of 0.7666 ($p < 0.05$). Therefore, the hypothesis in this study is accepted that board capital has a positive effect on climate change disclosures. The results of this study are in line with the research of Reeb & Zhao (2013) and Shui and Zhang (2020) but contradict the research of Al-Qahtani and Elgharbawy (2020). Uncertainties faced by companies such as climate change will be responded by companies with diverse boards by making more disclosures and higher quality disclosures (Shui & Zhang, 2020). Boards with good skills prefer that the public get more information through disclosures to assess the company's actual performance and assess how the company responds to uncertainties such as the risk of climate change. The practice of climate change disclosures will spread more quickly in the industry if the company has a board with good capabilities or a quality board. This matter in line with the demands from stakeholders for companies to convey information related to climate change. Companies that disclose more information will also be more favored by investors.

Table 3. Regression results

	1	2	3	4
BC	0.7666 ** (0.0155)			
NET		0.5872 * (0.0669)		
EDC			0.3827 * (0.0570)	
EXP				0.9320 *** (0.0074)
SIZE	0.5672 (0.0000)	0.6196 (0.0000)	0.6415 (0.0000)	0.5821 (0.0000)
ROE	0.0046 (0.6989)	0.0049 (0.6806)	0.0035 (0.7680)	0.0057 (0.6266)
LEV	-0.0712	-0.0668	-0.0695	-0.0482

	(0.2377)	(0.2750)	(0.2535)	(0.4116)
AGE	0.0211	0.0228	0.022	0.0251
	(0.0088)	(0.0063)	(0.0071)	(0.0012)
AUDIT	-0.7592	-0.7198	-0.7845	-0.7533
	(0.0310)	(0.0436)	(0.0264)	(0.0315)
adj. R2	0.3064	0.2891	0.2992	0.3119
F-Statistics	14.9909	13.8809	14.5215	15.3546
Prob F-Statistic	0.0000	0.0000	0.0000	0.0000
Observation	191	191	191	191

Information: **CCD** = Climate change index disclosed by the company; **BC** = Average value of networking, education, and experience board; **NET** = Board's network value; **EDC** = Board's education value; **EXP** = Board's experience value; **SIZE** = Ln of the company's total revenue; **ROE** = Ratio of profit after tax divided by equity; **LEV** = Ratio of debt divided by assets; **AGE** = number of years since the company was founded; **AUDIT** = Auditor, dummy variable 1 if the company is audited by big four audit firm and 0 otherwise.

Significance levels : *10%, **5%, ***1%

This study also examines the effect of each dimension of board capital separately, namely networking, education, and experience on climate change disclosures. Table 3 shows that networking has a positive effect. This means that the wider the network within the board, the higher the level of climate change disclosures. In their research, Shui and Zhang (2020) argue that boards that have external connections allow companies to respond to climate change through disclosures. The board wants the company to be viewed favorably by investors, the government, and other board connections. The higher the number of board members, the wider the connection, insight, and awareness of the board that can increase climate change disclosures. Furthermore, education has a positive effect, which means that the higher the board's education, the higher the level of climate change disclosures. These results are in line with the research of Chang et al., (2017) where the company benefits from the existence of a highly educated board because the board is free to express opinions and tends to be more committed to disclosures. Boards with higher education have more knowledge and skills to manage the company and make the best decisions for the company such as making climate change disclosures to gain legitimacy. Furthermore, experience has a positive effect where companies with more experienced boards will

be more aware of making climate change disclosures. Based on the results of research by Al-Mamun and Seamer (2021), boards that have expertise in the business field as well as those with international experience are more aware of how the environmental impact of business activities will have an impact on company legitimacy. Boards involved in associations, occupying various positions, or working in different companies or industries have a broader view so that they can compare business strategies, risk mitigation, and disclosures between companies or industries. With the influence of board capital that can increase climate change disclosures, companies can look for boards that have good abilities which can be indicated by high education, a lot of experience, and a wide network of work.

5. CONCLUSION

Climate change which is a global issue attracts the attention of various parties, especially stakeholders, so companies are under pressure to evaluate the impact of the risks that arise and disclose them to stakeholders. Disclosure is part of communication between company management and stakeholders so that the company gains legitimacy. In this study, it was found that board capital has a positive effect on climate change disclosures by examining 191 firm-year observations of banks listed on the Indonesia Stock Exchange from 2016-2020. Companies that have boards with good skills tend to disclose more information such as climate change disclosures. Board knowledge is an aspect that can affect the governance of a company. Boards with human capital and social capital will pay attention to their reputation by reducing information asymmetry between managers and investors and stakeholders so that they will make disclosures (Reeb & Zhao, 2013). The practice of climate change disclosures will be more widespread if the company has a board with good capabilities.

This research provides information for regulators to encourage companies to reduce carbon emissions and make disclosures. This study contributes to the literature on how board capital affects the disclosure of company information. The board plays a significant role in disclosing information about climate change, so companies need to pay attention to quality when selecting a board. This research is limited to the sample

companies, namely the banking sector in Indonesia. Subsequent research can use a wider sample, namely from other countries and other sectors. Subsequent research can also add moderating variables such as foreign ownership or use other measurements of climate change disclosures such as the Carbon Disclosures Project (CDP) Scores.

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