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Do Board of Commisioners Characteristic and International Environmental Certification Affect Carbon Disclosure? Evidence from Indonesia

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ABSTRACT

The purpose of this study is to examine the influence of the characteristics of the board of commissioners and international environmental certification on the disclosure of carbon emissions. Populations of this study are financial and non-financial companies listed on the Indonesia Stock Exchange (IDX) between 2015 and 2019. Panel data regression is employed to analysis data that collected from annual reports and sustainability reports of the sample companies. The results show that size of board of commissioners and the proportion of independent commissioners have a negative effect on the disclosure of carbon emissions. Gender diversity of the board of commissioners has a positive effect on the disclosure of carbon emissions, while nationality diversity and international environmental certification have no effect on the disclosure of carbon emissions.

Apakah Karakteristik Dewan Komisaris dan Sertifikasi Lingkungan Internasional Mempengaruhi Pengungkapan Karbon? Bukti Empiris dari Indonesia

ABSTRAK

Tujuan penelitian ini adalah untuk menguji pengaruh karakteristik dewan komisaris dan sertifikasi lingkungan internasional terhadap pengungkapan emisi karbon. Populasi penelitian adalah perusahaan keuangan dan non keuangan yang terdaftar di Bursa Efek Indonesia (BEI) periode 2015 sampai dengan 2019. Berdasarkan metode purposive sampling diperoleh data observasional sebanyak 227 firm-years observasi. Dengan menggunakan metode regresi data panel terhadap data yang diperoleh dari laporan tahunan dan laporan keberlanjutan perusahaan sampel, penelitian ini menemukan bahwa ukuran dewan komisaris dan proporsi komisaris independen berpengaruh negatif terhadap pengungkapan emisi karbon. Keragaman gender dewan komisaris berpengaruh positif terhadap pengungkapan emisi karbon, sedangkan keragaman nasionalitas dewan komisaris dan sertifikasi lingkungan internasional tidak berpengaruh terhadap pengungkapan emisi karbon.

1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) in 2007 stated that the average temperature of the earth's air over the last 3 centuries has increased at a rate of 0.74^0C ± 0.18^0C due to rising greenhouse gas emissions, with the largest amount being carbon dioxide gas (Amaliyah & Solikhah, 2019).

The production of carbon dioxide (CO_2) gas emissions is closely related to human activities, for example logging and deforestation, use of fossil fuels, increasing industrial quantities, and natural events such as volcanic eruptions. The official website of the World Resources Institute (WRI) states that in 2014 there were 6 countries as the world's highest carbon emitters, namely America, Europe, China, Russia, India and Indonesia. China is the largest producer of carbon dioxide emissions, amounting to 10.68 Mt CO_2e, America is in second place as a carbon dioxide emitting country of 5.82 Mt CO_2e. In third place is Europe with a volume of carbon emissions of 4.12 Mt CO2e. India occupies the fourth position as a emitter of carbon dioxide, which is 2.89 Mt CO2e. In fifth place is Russia with a volume of carbon emissions of 2.25 Mt CO2e.

Indonesia is in the sixth rank of carbon dioxide emitting countries with a volume of 2.05 billion Mt CO2e (Halimah & Yanto, 2018). A number of actions have been taken to reduce climate change. In 2000, the Carbon Disclosure Project (CDP) was established which aims to collect data on public companies related to the environment. CDP is an international non-profit organization that has the largest information on climate change in the world with more than 3,000 organizations in 60 countries (Choi et al., 2013).

According to CDP, the disclosure of carbon emissions can improve the company's reputation so that public trust in the company will increase. Ahmad et al. (2021) stated that the disclosure of carbon emissions in a company can also affect investmfent decision criteria, including investor behavior. Several things cause a company to need to disclose carbon emissions including as an expression of public communication, stakeholder interests, as a legal requirement and to understand environmental impacts (Blanco et al., 2017).

To address the world's concern for weather or climate change, an international agreement called Kyoto Protocol has been agreed. The Kyoto Protocol is an international convention established in Kyoto, Japan in 1997 (Irwhantoko & Basuki, 2016). From 1997 to 2007 the Kyoto Protocol has been ratified by 174 countries. The implication of the Kyoto Protocol is carbon accounting, which is a way for companies to recognize, measure, record, present and disclose carbon emissions (Pratiwi & Sari, 2016). The impact of carbon emission pollution encourages companies to disclose carbon emissions as a form of corporate responsibility to the environment. Ratnatunga & Balachandran (2009) states that carbon accounting is related to the efficiency of carbon emissions in the use of raw materials, factory overhead costs, labor costs, environmental overhead costs and costs associated with carbon standard management.

Indonesia ratified Law Number 6 of 1994 concerning the United Nations Framework Convention on Climate Change and ratified the first Kyoto protocol, namely by issuing Law of the Republic of Indonesia Number 17 of 2004 concerning Ratification of the Kyoto Protocol (Amaliyah & Solikhah, 2019). The reason behind Indonesia's ratification of the Kyoto Protocol is that Indonesia is an agrarian country, so that climate change can cause water and food disturbances (Pratiwi & Sari, 2016). Huelsenbeck (2012) stated that Indonesia is included in the top 10 countries most vulnerable to threats to food security due to the impact of climate change. With the issuance of various regulations, it can support the government to commit to reducing carbon emissions. This participation can be reflected through the disclosure of information about carbon emissions in the annual report and sustainability report.

Companies that disclose carbon emissions have reasons, namely to gain legitimacy from stakeholders, to avoid fines and threats of punishment (Berthelot & Robert, 2011). Presentation and disclosure of carbon emissions resulting from operational activities in company reports every year, is a company's effort to reduce and prevent the carbon emissions they produce (Syabilla et al., 2021). However, in reality, the disclosure of carbon emissions by companies in Indonesia is classified as voluntary disclosure, so that the implementation is still little carried out by business entities. This could be due to the high cost of disclosing emissions that could harm the company so that it still shows a relatively small number.

Several studies on the disclosure of carbon emissions using various factors have been carried out by several researchers. Choi et al. (2013) researched large companies in Australia during 2006 to 2008 found that corporate governance has a positive influence on the disclosure of carbon emissions. This means that disclosure is a function of the composition of the board, because the board controls and decides what information will be disclosed in the company's annual report. Galbreath

(2010) also reports that the composition of the board affects the company's practice in dealing with climate change issues. Amaliyah & Solikhah (2019) researching non-financial companies on the Indonesia Stock Exchange (IDX) during 2013 to 2017 found that the characteristics of corporate governance which include high institutional ownership and audit committees are able to increase the disclosure of carbon emissions. Meanwhile, international environmental certification, managerial ownership, independent commissioners, board of directors, age of the board of directors, and education level of commissioners have no influence on the disclosure of carbon emissions.

Mutmainah & Indrasari (2017) studied manufacturing companies on the Indonesia Stock Exchange (IDX) during 2013 to 2015 found that the size of the board of commissioners and the number of board meetings have a positive influence on environmental disclosure, this is because the board of commissioners has a very large and effective influence in decision making, monitoring and evaluation. Meanwhile, the proportion of independent commissioners has a negative effect on environmental disclosure, because the role of independent commissioners does not function properly, lacks competence and is less objective in overcoming and supervising the performance of the management. According to Rahmawati & Budiwati (2018), international environmental certification has an effect on the disclosure of carbon emissions in mining companies listed on the Indonesia Stock Exchange (IDX) and the Thailand Stock Exchange (SET) during 2014 to 2016, this is because the existence of international environmental certification can motivate companies to commit to improving the environment.

Solikhah et al. (2021) investigated manufacturing companies on the Indonesia Stock Exchange (IDX) during 2012 to 2015 found that corporate governance consisting of independent commissioners and institutional ownership has a positive influence on carbon emission disclosures. The existence of an independent board of commissioners and institutional ownership is able to optimize the supervision of environmental management. While international environmental certification does not affect the disclosure of carbon emissions, this means that companies that have good environmental performance do not affect the company's decision to make more extensive carbon disclosures.

Factors that encourage the disclosure of carbon emissions are the existence of corporate governance and international environmental certification (Choi et al., 2013); (Mutmainah & Indrasari, 2017); (Solikhah et al., 2021); (Rahmawati & Budiwati, 2018). One of the indicators in corporate governance is the board of commissioners, it is possible that in the disclosure of carbon emissions, the board of commissioners has a significant role. However, research on the characteristics of the board of commissioners and international environmental certification in financial and non-financial companies in Indonesia is still very rare. Therefore, this study contributes to providing new empirical evidence on how the characteristics of the board of commissioners and international environmental certification can affect the disclosure of carbon emissions in financial and non-financial companies listed on the Indonesia Stock Exchange for the 2015-2019 period.

Following section describes legitimacy theory, upper echelon theory and stakeholder theory followed by hypotheses development. Section 3 describes research methods that explains data collection and analysis techniques perfomed in this study. Section 4 shows the results and discussion. Las section provides conclusions, implications, limitations, and suggestions for further research.

2. Literature review and hypotheses development

Legitimacy theory explains that there is a link between companies and the social environment through government policies (Mujiani et al., 2019). In this theory it is explained that a company must carry out social responsibility towards the community to gain legitimacy from the community.

According to Amaliyah & Solikhah (2019), the existence of company activities in the community creates a desire from the community for companies to pay attention to environmental problems from the impact of company activities. Deegan and Unerman (2006) state that the company wishes to gain legitimacy from the community so that it can influence that the company has carried out operating activities with applicable legal rules and regulations. The company will gain legitimacy by itself if the community and the company have the expected goals, thereby reducing long-term threats (Deegan, 2002).

Upper echelon theory was first developed in 1984 by Hambrick and Manson. This theory assumes that the company's survival in the future by studying the management of the company. The characteristics of this management can explain the company's activities. Hambrick & Manson (1984) argue that the concept of management as the main strategic decision maker in an organization. The output or outcomes of an organization are directly influenced by strategic decisions made by management. Disclosure of carbon emissions is one of the strategic decisions in an organization that is influenced by top management. Executive experience, values, and personality are the main basis of upper echelon theory which greatly influences management's interpretation of the situation at hand and influences management choices (Hollindale et al., 2017).

Stakeholder theory explains to whom the company is responsible (Kelvin et al., 2017). A company cannot be separated from its stakeholders. According to Mujiani et al. (2019), stakeholders are groups or individuals as stakeholders, who have an interest in a company and can influence each other by business activities as a whole. The relationship between stakeholders and the company must be maintained, one way to maintain the relationship between the two is by disclosing a sustainability report that presents information about the environmental, social and economic performance of a company to stakeholders (Tarigan & Semuel, 2014). One part of the sustainability report is the disclosure of carbon emissions which is expected to meet the information needs of stakeholders.

Based on legitimacy theory, upper echelon theory, and stakeholder theory, it is necessary to harmonize company operations by management with provisions that bind the community (Astari et al., 2020). Hanifah (2016) states that a company in carrying out its business operations will have an impact on the environment, so to ensure that the management characteristics in a company can be responsible and guarantee human rights, it is necessary to disclose social and environmental information, one of which is the disclosure of carbon emissions.

Effect of board of commissioners size on carbon emission disclosure

The task of the board of commissioners is to carry out a series of decisions and is responsible for carrying out supervisory activities in handling policies carried out by the board of directors, and also providing advice to the board of directors (Trufvisa et al., 2019). The role of control and providing advice from the board of commissioners covers activities for improvement, prevention and prohibition. The size of the board of commissioners is directly proportional to the effectiveness in controlling and monitoring the board of directors.

The main function of the board of commissioners is to formulate strategies and policies that will be carried out by management, so that the board of commissioners can also make policies related to disclosure (Chithambo & Tauringana, 2014). Disclosure of carbon emissions is one form of information transparency in company activities (Trufvisa et al., 2019). Companies that show information regarding the disclosure of carbon emissions mean that the company is serious about dealing with the environmental impacts caused by its business activities (Kelvin et al., 2017).

The results of research by Mutmainah & Indrasari (2017) reveal that the size of the board of commissioners has a positive relationship with the disclosure of carbon emissions. The size of the board of commissioners can have a very large and effective influence on the company's decision making regarding the disclosure of carbon emissions. This research is supported by research by Zanra et al. (2020) which reveals that the size of the board of commissioners has a positive relationship with the disclosure of carbon emissions. It is possible for the board of commissioners to have the competence to increase oversight of the disclosure of carbon emissions and to participate in overseeing environmental concerns. So the hypothesis:

Hs1: Size of the board of commissioners has a positive effect on the disclosure of carbon emissions.

Effect of the proportion of the independent board of commissioners on carbon emission disclosure

According to Bapepam No. 29/PM/2004, an independent board of commissioners is a board of commissioners that has no affiliation with the board of directors, stakeholders, and other boards of commissioners. Therefore, the independent board of commissioners should be able to carry out supervision that focuses only on the interests of the company (Jizi et al., 2014).

The existence of an independent board of commissioners can encourage companies to be transparent by providing voluntary disclosures to stakeholders, namely through the disclosure of carbon emissions (Trufvisa et al., 2019). The decision-making process in the company can be balanced because of the existence of an independent board of commissioners. The Financial Services Authority Regulation No.33/POJK.04/2014 states that the proportion of independent commissioners in companies that go public must be at least 30% of the total members of the board of commissioners.

The results of research by Trufvisa et al. (2019) reveal that the proportion of independent commissioners has a positive relationship to carbon emissions. This means that the greater the proportion of independent commissioners, the more capable they are of providing adequate disclosure to stakeholders. This research is supported by research by Solikhah et al. (2021) which reveals that the proportion of independent commissioners has a positive relationship with the disclosure of carbon emissions. As supervisors, the board of commissioners tends to realize that voluntary disclosure of carbon emissions can maintain the company's legitimacy.

Ha2: The proportion of independent commissioners has a positive effect on the disclosure of carbon emissions.

Effect of gender diversity of the board of commissioners on carbon emission disclosure

Diverse knowledge, perspectives, creativity, and ideas can be enhanced by the diversity of the board of directors (Post et al., 2011). Group diversity, for example education, age, gender, cultural background can provide a lot of member knowledge (Trufvisa et al., 2019). The performance quality of a board with a high level of diversity will be better than a board that is homogeneous, even though it has superior capabilities. The proportion of female board of commissioners motivates management to develop company interactions with stakeholders or stakeholders through disclosure.

The presence of women is considered to be able to improve the image and reputation of the company through environmental disclosure, so that women on the board of commissioners can have a positive influence on the company (Barako & Brown, 2008). According to Liao et al. (2015), women have a higher attitude of concern for the surrounding environment when compared to men, so that they can motivate companies to voluntarily make environmental disclosures.

The results of research from Oktadhea (2019) stated that the gender diversity of the board of commissioners has a positive relationship with the disclosure of carbon emissions. This means that a higher proportion of female commissioners will be able to increase the effectiveness of the board, and the presence of a female board of commissioners will provide better participation. This research is supported by research by (Hollindale et al., 2017), which states that the gender diversity of the board of commissioners has a positive relationship with the disclosure of carbon emissions. Companies that have female board members are more likely to tackle problems that arise from climate change and carbon emissions. The research of Zanra et al. (2020) also states that the gender diversity of the board of commissioners has a positive relationship with the disclosure of carbon emissions. The large proportion of female board members is able to encourage management to take responsible actions that can improve the company's relationship with stakeholders through disclosure.

Ha3: Gender diversity of board of commissioners has a positive effect on the disclosure of carbon emissions.

Effect of national diversity of the board of commissioners on carbon emission disclosure

Board of commissioners who have various nationalities are generally found in companies that have diverse shareholders, also have a worldwide business reach. Companies that have boards of commissioners of various nationalities have high support and are prone to pressure from stakeholders who have an attachment to global warming and climate change (Kılıç & Kuzey, 2018).

The existence of a board of commissioners who has a foreign nationality is considered to have a good influence on the continuity of the company's business, this good influence can have an impact on the sustainability of the company's information disclosure business activities so as to minimize the occurrence of information asymmetry (Damanik & Dewayanto, 2021). Irwansyah et al. (2020) stated that the national diversity of the board of commissioners provides different opinions and perspectives in the form of education, experience, professionalism and culture that varies between countries.

The results of the research by Kılıç & Kuzey (2019) stated that the national diversity of the board of commissioners has a positive relationship with the disclosure of carbon emissions. Entities with a diverse national board of commissioners have a larger audience and may experience pressure from various stakeholder groups related to climate change. In this case, the diversity of nationalities is expected to be involved in the practice of reducing carbon emissions and in disclosing information about carbon emissions.

Ha4: The national diversity of the board of commissioners has a positive effect on the disclosure of carbon emissions.

Effect of international environmental certification on carbon emission disclosure

Many business entities do not participate in environmental regulations when conducting their business. In fact, there are still many who have not implemented the ISO 14001 environmental management system (Andayani, 2015). The impact of carbon emissions can be minimized by implementing an environmental management system (Prafitri & Zulaikha, 2016)

The international standard of environmental management system known as ISO 14001 environmental certification is the best practice in environmental management, the benefits of which are to achieve sustainable management improvements and as a form of environmental control (Andayani, 2015). The environmental management system prioritizes pollution prevention.

According to Dianawati (2016) by giving the ISO 14001 award to companies that pay attention to environmental management, it can increase the company's self-confidence so that external parties will believe that the company has control over operating activities and has a commitment to comply with environmental regulations.

The results of research by Prafitri & Zulaikha (2016) state that international environmental certification has a positive relationship with the disclosure of carbon emissions. Companies that have international environmental certification mean that they have good environmental performance and will try to communicate their performance in the form of disclosure. This is also done to show the company's commitment to the environment in order to gain stakeholder support and also legitimacy from the community.

The results of research by Rahmawati & Budiwati (2018) also state that international environmental certification has a positive relationship with the disclosure of carbon emissions. Companies that implement ISO 14001 are committed to making improvements in the environment. So the hypothesis:

Ha5: International environmental certification has a positive effect on the disclosure of carbon emissions.

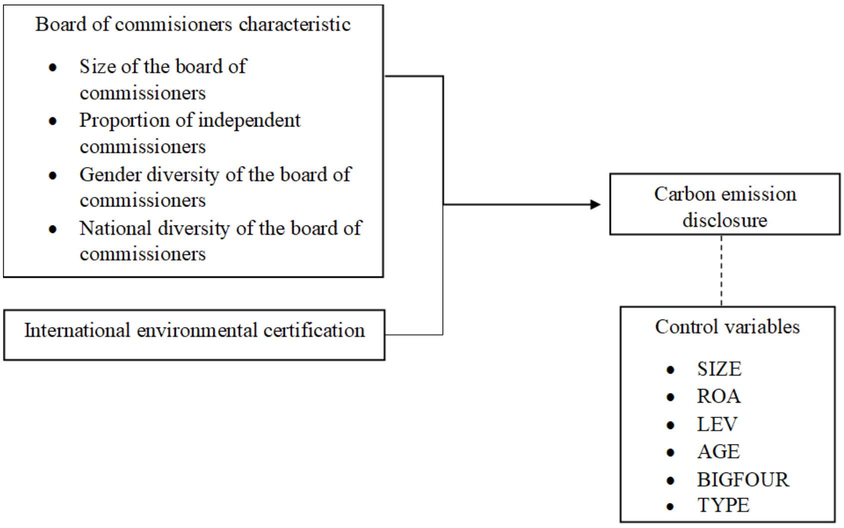

Figure 1. Conceptual framework

3. Research method

This type of research is quantitative research with a sample of 227 firm-years observations. The object of research was financial and non-financial companies listed on the Indonesia Stock Exchange (IDX) which publish annual reports and sustainability reports for the 2015-2019 period.

The dependent variable in this study is carbon emission disclosure which was analyzed based on 18 parameter items from the research of Choi et al. (2013). The calculation index on the disclosure of carbon emissions is with a dichotomous scale, giving a score for each item of disclosure. Each disclosure item is worth 1, if the company discloses all items in its company report, then the maximum score obtained is 18.

The independent variables in this study are the characteristics of the board of commissioners and international environmental certification. The characteristics of the board of commissioners consist of the size of the board of commissioners, the proportion of independent commissioners, the gender diversity of the board of commissioners and the diversity of nationalities of the board of commissioners. The control variables in this study are firm size, profitability, leverage, firm age, big four audit firms, and firm type. The size of the board of commissioners is calculated by the total of all members of the board of commissioners (Amaliyah & Solikhah, 2019).

The proportion of independent commissioners is calculated by comparing the total independent commissioners with the total number of members of the board of commissioners (Herlina & Juliarto, 2019). The gender diversity of the board of commissioners is measured by the percentage of female commissioners (Grediani et al., 2020). The national diversity of the board of commissioners is calculated by the percentage of foreign commissioners (Setiawan et al., 2019).

International environmental certification is measured by ISO 14001 certification (Rahmawati & Budiwati, 2018), namely with a dummy variable. If the company has ISO 14001 certification then the score is 1 and if not then the score is 0.

The data were analyzed using panel data regression with the equation model:

$$CED = \alpha + \beta 1\ BSIZE + \beta 2\ BINDP + \beta 3\ GENDER + \beta 4\ FOREIGN + \beta 5\ ISO + \beta 6\ SIZE + \beta 7\ ROA + \beta 8\ LEV + \beta 9\ AGE + \beta 10\ BIGFOUR + \beta 11\ TYPE + e$$

Where:

CED = Carbon Emission Disclosure. BSIZE = Board of commissioners proportion. BINDP = Independent board of commissioners. GENDER = Gender diversity of the board of commissioners. FOREIGN = National diversity of the board of commissioners. SIZE = Company size. ROA = Profitability. LEV = Leverage. AGE = Age of the company.

4. Result and discussion

Population and sample

This study uses financial and non-financial companies listed on the Indonesia Stock Exchange in 2015-2019. There are 320 firm-years of financial and non-financial listed on the Indonesia Stock Exchange that publish sustainability reports and annual reports for 2015-2019. However, 93 firm-years did not provide information on at least 1 of the 18 carbon emission disclosure items in the sustainability report during 2015-2019, so that the final sample in this study is 227 firm-years with details in the following table:

Table 1. Population and sample

Financial and non-financial companies listed on the Indonesia Stock Exchange that publish sustainability reports and annual reports for 2015-2019	320
Companies that do not provide information on at least 1 of the 18 items for disclosing carbon emissions in the sustainability report during 2015-2019	93
Research sample	227

Descriptive statistics

Table 2 presents the emission disclosure index. Disclosure value is between 0.0556 to 0.9444. The carbon emission disclosure index consists of 18 items, so the highest score that can be achieved is 18.

Table 2. Descriptive statistics

Variabel	Obs	Mean	Std. Dev	Min	Max
CED	227	0.4790	0.2385	0.0556	0.9444
BSIZE	227	5.8194	2.1031	2	13
BINDP	227	0.4329	0.1346	0	0.8
GENDER	227	0.0913	0.1276	0	0.5
FOREIGN	227	0.1591	0.2378	0	0.75
ISO	227	0.7225	0.4488	0	1
SIZE	227	30.9889	1.6581	26.0387	34.8872
ROA	227	0.0633	0.1074	-0.1143	0.9250
LEV	227	0.5580	0.2421	0.0424	1.8977
AGE	227	42.9251	21.6917	2	100
BIGFOUR	227	0.8326	0.3742	0	1
TYPE	227	0.7401	0.4396	0	1

CED = Carbon Emission Disclosure. BSIZE = Board of commissioner proportion. BINDP = Independent board of commissioners. GENDER = Gender diversity of the board of commissioners. FOREIGN = National diversity of the board of commissioners. SIZE = Company size. ROA = Profitability. LEV = Leverage. AGE = Age of the company.

Table 2 presents the emission disclosure index. Disclosure value is between 0.0556 to 0.9444. The carbon emission disclosure index consists of 18 items, so the highest score that can be achieved is 18. The value of disclosure in the study is 1 to 17. This states that the minimum and maximum values have a far range of values, while the average value is 0.4790. Then in this study the size of the board of commissioners is 2 to 13 people, with an average of 6 boards of commissioners. Furthermore, the independent board of commissioners in this study ranged from 0 to 0.08 with an average of 0.4329. Then the gender diversity of the board of commissioners in this study ranged from 0 to 0.5 with an average of 0.0913. The national diversity of the board of commissioners in this study ranged from 0 to 0.75 with an average of 0.1591. International environmental certifications range from 0 to 1 with an average of 0.7225.

Table 2 also shows descriptive statistics on the control variables. Company size ranged from 26.0387 to 34.8872 with an average of 1.6581. ROA profitability shows a range of 11.43% loss value to 92.50% profit value with an average value of 6.33%. The company's leverage ranges from 0.0424 to 1.8977 with an average of 0.5580. In this study, the age of the company is between 2 years to 100 years with an average of 43 years. Bigfour audit firms ranged from 0 to 1 with an average of 0.8326. The type of company ranges from 0 to 1 with an average of 0.740.

Table 3. Descriptive statistics of dummy variables

	Category 1	Category 0
ISO	0.7225	0.2775
BIGFOUR	0.8326	0.1674
TYPE	0.7401	0.2599

ISO = Independent variable indicating ownership of international environmental certification which is worth 1 and is worth 0 if it does not have international environmental certification. BIGFOUR = Control variable which shows the financial statements audited by bigfour audit firms with a value of 1 and a value of 0 for unaudited financial statements by bigfour audit firms. TYPE = Control variable that shows the type of non-financial company with a value of 1 and a value of 0 for financial companies.

Results analysis and discussion

Ha1 states that the size of the board of commissioners had a negative effect on the disclosure of carbon emissions. This means that Ha1 is rejected. This indicated that the agency theory which explained the existence of a board of commissioners having a role in monitoring the company's environmental performance could not be supported in this study, the more the number of the board of commissioners, the lower the supervision. Zulhaimi (2019) states that the high size of the board of commissioners in a company is not necessarily proportional to the extent of disclosure of carbon emissions. The board of commissioners has the responsibility to oversee the company's internal control. The effectiveness of the supervision is not measured only by the number of members of the board of commissioners. However, it focuses more on the confidence obtained by the company and also on the potential of the board of commissioners.

The independent board of commissioner’s views that information regarding disclosure of carbon emissions was not as important as other types of disclosure information. These results indicated that the independent board was more conservative in disclosing information about carbon emissions to stakeholders and other stakeholders. These results are supported by Qa’dan & Suwaidan (2019), Damanik & Dewayanto (2021), and Nasih et al. (2019) who explain that independent boards of commissioners have a negative relationship with disclosure of carbon emissions.

The test results on Ha3 stated that the board of commissioners' gender diversity variable had a positive effect on the disclosure of carbon emissions. This means that Ha3 is accepted. In this study, gender diversity could motivate companies to disclose carbon emissions. With the number of women commissioners being a minority, it turned out to be influential in determining a company decision. This was supported by agency theory, which stated that the company's management performance could be improved with a diverse board and the level of information asymmetry could be minimized.

Table 4. Hypothesis testing results

	1	2	3	4	5	6
C	-12.033 (0.005)	-10.387 (0.015)	-11.549 (0.007)	-10.885 (0.011)	-11.013 (0.010)	-12.208 (0.004)
BSIZE	-0.0139** (0.023)					-0.1313** (0.029)
BINDP		-0.1332** (0.023)				-0.1336** (0.021)
GENDER			0.1304* (0.072)			0.1523** (0.033)
FOREIGN				-0.0812 (0.291)		-0.2080 (0.440)
ISO					0.0408 (0.464)	0.0237 (0.664)
SIZE	0.0436*** (0.001)	0.0378*** (0.004)	0.0387*** (0.004)	0.0377*** (0.005)	0.0375*** (0.005)	0.0461*** (0.001)
ROA	0.1416* (0.088)	0.1168 (0.161)	0.1531* (0.067)	0.1492* (0.077)	0.1375 (0.101)	0.1461* (0.077)
LEV	0.0143 (0.790)	0.0252 (0.632)	0.0423 (0.419)	0.1996 (0.726)	0.0428 (0.417)	-0.0189 (0.740)
AGE	0.0046*** (0.000)	0.0046*** (0.000)	0.0044*** (0.000)	0.0045*** (0.000)	0.0044*** (0.000)	0.0050*** (0.000)
BIGFOUR	-0.0550* (0.062)	-0.0564* (0.055)	-0.0650** (0.029)	-0.0555* (0.064)	-0.0596** (0.045)	-0.0584** (0.046)
TYPE	0.3140*** (0.000)	0.2972*** (0.000)	0.3260*** (0.000)	0.3156*** (0.000)	0.2797*** (0.001)	0.2831*** (0.001)
Adjusted R^2	0.4040	0.3957	0.3907	0.3965	0.3907	0.4177
F-statistic	53.97	53.73	51.49	49.16	48.39	64.73
Prob (F-Statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observation	227	227	227	227	227	227

Notes:
*****, **, *Significance at 1%, 5%, 10% levels.**

Concern for the environment has grown if there is gender diversity on the board of commissioners. This result is supported by research by Damanik & Dewayanto (2021), Zanra et al. (2020), Oktadhea (2019) which explains that the gender diversity of the board of commissioners has a positive effect on disclosure of carbon emissions.

The test results on Ha4 stated that the variable national diversity had no effect on the disclosure of carbon emissions. This means that Ha4 is rejected. In this study, the nationality of the board of commissioners, both Indonesian and non-Indonesian, had no effect on increasing or decreasing carbon emission disclosures. Citizenship was not a guarantee of increased disclosure of carbon emissions. The government in Indonesia has made policies regarding climate change. Diversity could provide input on diverse opinions in effective decision making, but without diversity of nationalities, the board of commissioners of the company would still consider efforts to disclose carbon emissions. Hadya & Susanto (2018) states that in general, foreigners who work in companies that are not their birthplace have a salary orientation, while the element of loyalty does not necessarily exist. The results of this study are supported by research by Trufvisa et al. (2019), Oktadhea (2019), Hadya & Susanto (2018) which state that disclosure of carbon emissions affects the disclosure of carbon emissions.

The test results on Ha5 stated that the international environmental certification variable had no effect on the disclosure of carbon emissions. This means that Ha5 is rejected. The existence of international environmental certification did not fully show an increase in environmental performance to disclose carbon emissions. Considering that the disclosure of carbon emissions was voluntary, companies that had received ISO 14001 certification did not feel the need to disclose carbon emissions because the company's environmental performance was internationally certified and had made efforts to minimize the negative impact of the company's activities on the environment. The international environmental certification obtained by the company would not have an impact on stakeholder decisions. A good environmental management system can be demonstrated by having an ISO 14001 certificate.

The positive image of ISO 14001 tended to reduce management's motivation to expand disclosure of carbon emissions. In addition, ISO 14001 did not directly require the management of carbon emissions. If companies want to reduce carbon emissions, it must allocate additional costs. The results of this study are supported by Pradini & Kiswara (2013), Ningrum (2018), and Solikhah et al. (2021).

5. Conclusions

This study examines the effect of the characteristics of the board of commissioners and international environmental certification on the disclosure of carbon emissions in non-financial and financial companies in Indonesia. The characteristics of the board of commissioners discussed in this study include the size of the board of commissioners, the proportion of the board of independent commissioners, the gender diversity of the board of commissioners, and the national diversity of the board of commissioners. The test results prove that the size of the board of commissioners has a negative effect on the disclosure of carbon emissions. This means that every addition to the board of commissioners will have an effect on reducing carbon emission disclosures in a company. The proportion of the board of commissioners has a negative effect on the disclosure of carbon emissions. This means that the smaller the independent board of commissioners, the greater the level of carbon emission disclosure.

Gender diversity has a positive effect on disclosure of carbon emissions. This means that a woman's board of commissioners can provide added value in a company because women are considered to care about the environment and pay more attention to voluntary carbon emission disclosure. National diversity has no effect on disclosure of carbon emissions. Although diversity can provide input on various ideas in effective decision making, without diversity of nationalities, the company's board of commissioners will still consider efforts to disclose carbon emissions. International environmental certification has no effect on disclosure of carbon emissions. Companies that receive ISO 14001 certification feel that they do not need to disclose carbon emissions because the company's environmental performance is internationally certified and have made efforts to minimize the negative impact of company activities on the environment.

Some limitations of this study for instance the sample number is relatively small as not all companies disclose information about carbon emissions in their annual reports or sustainability reports. Moreover, the Carbon Emission Disclosure Index from Choi et al., (2013) is used in this study. Other proxies can be used for further research and also consider other variables that might affect the disclosure of carbon emissions.

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