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The Role of Corporate Governance as a Moderating Variable on Earnings Management and Carbon Emission Disclosure

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ABSTRACT

The purpose of this study is to examine the influence of earnings management on carbon emission disclosure with corporate governance as a moderating variable. The population was companies in the sector of industry and chemical, agriculture, energy, transportation listed on the Indonesia stock exchange (IDX). Based on the purposive sampling method, 12 companies were selected as the samples (60 firm-year observations). The data analysis technique used is the moderate regression analysis (MRA). The results showed that the earnings management has a significant positive effect on carbon emission disclosure. The board of commissioner size moderates the influence of the earnings management on the carbon emission disclosure. The board of directors has a role in affecting the carbon emission disclosure, while the independent commissioners, the institutional ownership, and the audit committee meetings do not have a significant effect on weakening the effect of profit management on carbon emission disclosure.

Pengaruh Manajemen Laba Terhadap Pengungkapan Emisi Karbon dengan Corporate Governance sebagai Variabel Moderasi

ABSTRAK

Tujuan penelitian ini adalah menguji pengaruh manajemen laba terhadap pengungkapan emisi karbon dimana corporate governance berperan sebagai variabel moderasi. Teknik analisis menggunakan moderate regression analysis (MRA). Populasi penelitian adalah perusahaan sektor industri dasar dan kimia, pertanian, energi, transportasi yang terdaftar di bursa efek Indonesia (BEI). Berdasarkan metode purposive sampling, 12 sampel perusahaan dipilih (60 observasi). Hasil penelitian menunjukkan bahwa adanya praktik manajemen laba dalam perusahaan dapat meningkatkan pengungkapan informasi emisi karbon. Dewan komisaris berperan dalam mempengaruhi pengungkapan emisi karbon, sedangkan dewan komisaris independen, kepemilikan institusional, dan jumlah pertemuan audit committee tidak memiliki peran dalam hubungan antara manajemen laba terhadap pengungkapan emisi karbon.

1. Introduction

In 2010, Burger King decided to stop purchasing palm oil from PT. Sinar Mas Agro Resources and Technology (SMART), because the suppling company has involved in the destruction of tropical forests, and other

following consequences which contributed to global climate change or global warming (Neviana, 2010). The issues regarding climate change and its impact have led to the emergence of regulations to reduce the number of

greenhouse gases in every country (Borghei-Ghomi & Leung, 2013).

As the gas emissions contributors, companies are encouraged to disclose information about carbon emissions they produce. Several countries such as the European Union, the United States, Canada, Japan, South Korea, and New Zealand have already mandatory regulations in place regarding carbon emission disclosure (World Resources Institute, 2015).

Since 2013, the Indonesian government has continuously released regulations to reduce carbon emissions and to attain sustainable development as its contribution to overcome global warming problems (Faisal et al., 2018). In Indonesia, concern on the carbon emission disclosure has emerged after the government issued Presidential Regulation No. 61/2011 concerning the National Action Plan for Reducing Greenhouse Gas Emissions (or RAN-GRK), and Presidential Regulation No. 71 (2011) regarding the implementation of national Greenhouse Gas Inventory (Nainggolan & Rohman, 2015). However, the carbon emission disclosure in Indonesia is still voluntary, thus every company has the flexibility in determining what information they will not disclose and consider as relevant information for the decision making process.

The carbon emission disclosure is a form of accountability that used to explain the impacts of corporate operational activities on climate change. However, the disclosure of carbon emissions can contain several risks for corporate, such as increasing operating costs (Coburn et al., 2011), decreasing market value (Aggarwal & Dow, 2011), and giving managers opportunities to engage in earnings management (Prior et al., 2008).

According to experts, managers who involve in earning management practice might use corporate social responsibility disclosure to keep their position in the company and increase the confidence from stakeholders (Prior et al., 2008). The results of previous studies unveiled that good

corporate governance can support management to carry out activities that benefit themselves (Chen et al., 2007; Dechow et al., 1996; Klein, 2002; Mansor et al., 2013). The corporate governance mechanism is expected to control management performance and determine carbon emissions disclosure policies. Choi et al., (2013) and Elyasih et al., (2018) showed that the effectiveness of corporate governance is the main key to control the carbon emissions disclosure in the annual report.

Sun et al., (2010) demonstrated the role of corporate governance mechanism as a moderation variable, proxied by the number of audit committee meetings. It weaken the effect of earnings management on corporate environmental disclosure, while board size does not have such impact. Besides, the earnings management, measured by discretionary accruals, does not have a significant effect on corporate environmental disclosure (Sun et al., 2010). Meanwhile, Faisal et al., (2018) found that carbon emissions disclosure is one effort done by managers to respond to stakeholders' pressure.

This study aims to investigate the effect of earnings management on carbon emissions disclosure with the role of corporate governance as a moderating variable. Unlike previous studies, for instance Sun et al., (2010), the carbon emissions disclosure was measured using an index developed by Choi et al., (2013), as a part of the Carbon Disclosure Project (CDP). The carbon emissions questionnaire issued by CDP can be used in various countries because it has a standard of voluntary disclosure that is globally accepted (Blanco et al., 2017).

Therefore, this study contributes to the confirmation of stakeholder theory and agency theory. The results can be used to advise management to implement good corporate governance and enhance transparency, accountability, and also reduce earnings management practices. Besides, this research expected to be an input for the regulator to

determine corporate governance to reduce earnings management practices, and carbon emissions management to respond to the problem of climate change.

The next section discusses the stakeholder theory and agency theory that used to explain and propose the tested hypothesis. Following that, the research method section describes how this study undertaken. In results and discussion part, the research findings are presented and discussed. Conclusion and recommendations for further studies can be found in the last section of this paper.

2. Literature review

Stakeholder theory

Stakeholder theory explains how management meets the expectations of stakeholders (Freeman, 2010). According to the theory, paying attention to the needs of broader stakeholders is imperative for those companies implementing social responsibility (Velayutham, 2014). The stakeholder pressure is considered to be more influential on managers' attitudes in controlling social and environmental problems compared to regulations or mandatory disclosure rules (Wood & Ross, 2006). Neu et al., (1998) found that some companies were more responsive to the demands of financial stakeholder groups compared to other groups such as environmental observers/activists. In this case, management issued to responsible for balancing conflicting pressures from various stakeholders (Brower & Mahajan, 2013).

Agency theory

Agency theory is a theory that explains the relationship between the principal and agent or referred by the agency relationship. Smith (1937) in his work *The Wealth of Nations*, states that if an organization managed by a person or group who are not owners, then there is a possibility that the person or group will not work for the benefit of the owner (Panda & Leepsa, 2017).

An agency relationship is a contract between the principal and the agent who works to fulfill his interest lead to agency conflict (Panda & Leepsa, 2017). The agency relations lead to conflicts of interest due to the inconsistency of interests between agents and principals because managers do not always act in the interests of the owner (Messier et al., 2008). Agency theory helps in applying corporate governance mechanisms to control agent actions and replace agency conflicts within the company (Panda & Leepsa, 2017).

Agency theory offers a framework linking carbon emissions disclosure with corporate governance mechanisms. According to the theory, a good corporate governance mechanism can improve a company's ability to deal with existing problems and reduce agency conflict (Haniffa & Cooke, 2002). In addition, agency theory views carbon emissions reporting as a solution to reducing information asymmetry between agents and principals (Salewski & Zulch, 2014).

Earnings management

Earnings management is a choice of accounting policies selected by managers or concrete actions that can affect earnings, to achieve a certain profit reporting goal (Scott, 2015:455). Managers may choose accounting policies that support the achievement of certain objectives within the limits set by the Generally Accepted Accounting Principles (GAAP). GAAP is flexible, allowing management to use this policy to report actual earnings that do not accurately reflect the company's economic conditions (Prior et al., 2008).

Earnings management in an opportunistic perspective seeks to provide information that can mislead investors but protect the performance, reputation, and compensation of managers within the company. Managers who are indicated to carry out earnings management are trying to cover up one of these actions by expressing

broader social responsibility in the form of disclosure of carbon emissions.

Disclosure of social responsibility gives rise to an image that the company is environmentally friendly so that it can increase support from stakeholders (Prior et al., 2008). The stakeholders will ultimately divert supervision from any indication of earnings management with good corporate social responsibility performance.

Carbon emission and carbon emission disclosure

Greenhouse gas emissions are referred to as carbon emissions because the amount of greenhouse gas emissions is often calculated based on the amount of carbon dioxide (CO₂). Concentrations of carbon dioxide (CO₂) in the earth's atmosphere have increased since the start of the industrial revolution because at this time human activity develops rapidly. Carbon dioxide (CO₂) is part of a greenhouse gas that must be reduced by member countries according to the amendment to the Kyoto Protocol (United Nations Framework Convention on Climate Change (UNFCCC, 1988).

The disclosure of carbon emissions which is part of social responsibility, regulated in Indonesia Statement of Financial Accounting Standard (or *Pernyataan Standar Akuntansi Keuangan/PSAK*) No. 1 paragraph 9 concerning environmental problems. The disclosure and reporting of carbon emissions information in Indonesia began to develop after the government issued Presidential Regulation No. 61/2011 concerning the National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK) and Presidential Regulation No. 71 of 2011 concerning the Implementation of the National Greenhouse Gas Inventory (Nainggolan & Rohman, 2015).

The practice of disclosing carbon emissions is seen as a form of corporate accountability to the public to explain the impact of the company's activities on climate change. Further regulations

on voluntary disclosure of carbon gas emissions have not been established by the Indonesian Financial Services Authority (Bapepam-LK, 2002). The BAPEPAM only regulates mandatory disclosures required by accounting standards through decision No. SE-02 / PM / 2002.

Corporate governance

Corporate governance defined as a set of mechanisms that control companies directly by stakeholders' expectations (ICG, 2015). The concept of corporate governance started to be an important issue to investigate since the separation between ownership and management particularly after the 1930 (Khan, 2011). Corporate governance aims to create added value for stakeholders, explain, and enhance the role of the board of directors, the board of commissioners, management, and shareholders (FCGI, 2001). Also, a sound corporate governance mechanism is expected to reduce the manipulation activities that can be carried out within the company and creating value-added.

Earnings management and carbon emissions disclosure

The stakeholder theory explains that managers do not only act as agents of the owner but also of other stakeholders (Sun et al., 2010). As a controller of the decision-making process, managers tend to maximize their profits by making financial reports that are more informative but have an impact on the interests of other stakeholders (Prior et al., 2008; Sun et al., 2010).

Agency theory explains that as a principal, investors naturally want to profit from the funds invested. While managers as agents want bonuses and compensation in return for their performance. Social responsibility expressed to give the impression to stakeholders that the company is transparent. Companies involved in earnings management are behind the company's transparent image (Kim et al., 2012). Prior et al.,

(2008) and Gavana et al., (2017) found earnings management had a positive effect on disclosure of social responsibility. Disclosure of social responsibility is used to cover earnings management actions that will have a direct impact on stakeholders.

Hope et al., (2013) uncovered the extent of disclosure of corporate social responsibility can be influenced by the interests of opportunistic managers. Callery & Perkins (2017) used forensic analysis and found that disclosure of carbon emissions is related to symbolic management, which is to increase the attention of stakeholders to the company's non-financial performance.

H₁: Earnings management has a positive effect on carbon emissions disclosure

Mechanism of corporate governance

Size of board of commissioner

Indonesia adopted a European continental legal system that separated the structure of the company council into two levels (two-tier system). The board of commissioner have a role as a supervisor, while the board of directors (including management) acts as an executive. The board of commissioners uses financial statements to assess the performance of the board of directors. However, the board of directors often manipulates numbers in the records to present good financial reports (Nugroho & Eko, 2011).

According to Anderson et al., (2004), the size of the board of commissioners plays an important role in monitoring the function of the board of directors and reducing agency conflicts. Research by Obigbemi et al., (2016) shows that the size of the board of commissioners can reduce earnings management in line with the background knowledge and experience of different board members. The larger size of the board of commissioners tends to carry out effective monitoring mechanisms and encourage disclosure, to reduce information asymmetry between management and shareholders (Buertey et al., 2019). In line with previous research, Nasih et al.,

(2019) also found that the size of the board of commissioners had a positive effect on the disclosure of carbon emissions to achieve corporate transparency.

H_{2a}: The size of the board of commissioners moderates the effect of earnings management on the carbon-emissions disclosure.

Independent board of commissioners

The mechanism of corporate governance is effective if the company has a majority of independent boards of commissioners that carry out the monitoring function of management (Dechow et al., 1996; Velayutham, 2014). The monitoring function is carried out to reduce opportunistic actions and information asymmetries by disclosing relevant information in the annual report.

The independent board of commissioners has a higher awareness of the demands in controlling carbon emissions compared to management. The management considers that investment in controlling carbon emissions will only produce long-term benefits. While the independent board of commissioners has a desire to provide transparent information related to policies and carbon emissions to various stakeholders (Rupley et al., 2012).

If the carbon emissions disclosure still voluntary, management will have the authority to decide what kind of information they disclose (Bansal et al., 2018). Therefore, the independent board of commissioners play an important role in encouraging carbon emissions disclosure and responsible for stakeholder's welfare (Bansal et al., 2018). Previous studies have found that an independent board of commissioners encourages companies to disclose carbon emissions (Kilic & Kuzey, 2018; Liao et al., 2014; Rupley et al., 2012)

H_{2b}: The independent board of commissioners moderates the effect of earnings

management on the carbon-emissions disclosure.

Institutional ownership

Institutional ownership is a company share owned by institutions such as insurance companies, banks, investment companies and others (Fransiska et al., 2016). Al-Zyoud (2012) uncovered that institutional ownership has a negative effect on earnings management.

These results indicate that institutional ownership is an effective corporate governance mechanism to limit earnings management. In line with previous research, Attig et al., (2012) explained that institutional investors play a role in efficient corporate governance mechanisms to reduce information asymmetry and agency problems.

Research Zhou et al., (2018) showed that carbon emissions disclosure can be used as a corporate communication tool to an investor for reducing agency costs and limit the behavior of

opportunistic management. Velayutham (2014) found institutional ownership has a positive effect on carbon emissions disclosure. This result shows that institutional investors have an important role in occupying the pressure of stakeholders through carbon-emissions disclosure.

H_{2c}: Institutional ownership moderates the effect of earnings management on the carbon-emissions disclosure.

Audit committee meetings

Audit committee meetings are held regularly every year to ensure the financial reporting process and the disclosure of social responsibility function properly (Soliman & Ragab, 2014). Audit committee meetings are referring to the number of meetings held annually for monitoring management activities effectively (Appuhami & Tashakor, 2017). Saleh et al., (2007) found that audit committee meetings significantly influence earnings management.

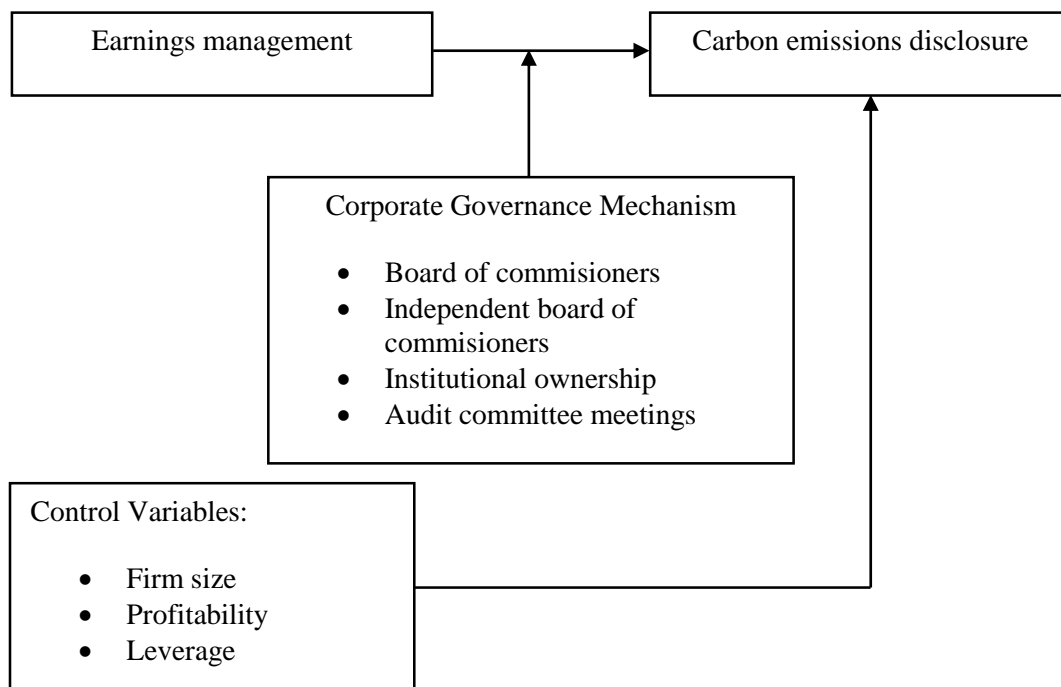


Figure 1. Conceptual framework

According to Albersmann & Hohenfels (2017), a sufficient frequency of meetings between 4 and 5 times a year can show the role of the audit committee effectively to reduce the

level of earnings management. At the same time, the higher frequency of audit committee meetings also helps each member in ensuring the quality of

corporate social responsibility disclosure (Appuhami & Tashakor, 2017).

Furthermore, Allegrini & Greco (2013) and Chariri et al., (2018) found the frequency of audit committee meetings had a positive effect on the disclosure of carbon emissions. The higher frequency of audit committee meetings increases the oversight function of carbon emission disclosures by the management effectively. The carbon emissions disclosure illustrates corporate transparency which can be used as a means of reducing agency problems and information asymmetry between majority and minority shareholders (Allegrini & Greco, 2013).

H_{2a}: Audit committee meetings moderates the effect of earnings management on the carbon-emissions disclosure.

3. Research method

The population of this study is companies in the basic industry and chemical, agriculture,

energy, transportation sectors listed on the Indonesia Stock Exchange (BEI) between 2014 and 2018. These sectors are four priority areas proposed by the Ministry of National Development Planning (or BAPPENAS) refer to the Presidential Regulation No. 61 of 2011 concerning National Action Plan for Reduction of Greenhouse Gas Emissions (or *Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca/RAN-GRK*). The sample is those companies that publish audited annual reports during the period 2014 to 2018 in Rupiah.

In addition, the sample company did not experience loss and disclosed at least one policy, or one item related to carbon emissions disclosure in the annual report for the period 2014 - 2018. Having considering these criteria, this study obtained a final sample of 12 companies with a total of 60 observations with details in the following table:

Table 1. Judgmental sampling

No	Criteria	Number of companies
	Companies in the basic and chemical, agriculture, energy, transportation sectors listed on the Indonesia Stock Exchange 2014 – 2018	116
1	Companies that do not publish audited annual reports during the period 2014 - 2018	(4)
2	Companies that implicitly or explicitly do not disclose at least one policy or one item of disclosure related to carbon emissions in the annual report for the period 2014 - 2018.	(80)
3	The companies use other currency (US\$) only	(10)
4	The company suffered a loss	(10)
	Total	12
	Observation for 5 years (2014-2018)	60

The annual reports were obtained from the Indonesia Stock Exchange (www.idx.co.id) and the company's website. The company's sustainability report used to obtain carbon emissions disclosure data. Moderate regression

analysis (MRA) used to maintain sample integration and control the effect of moderating variables (Ghozali, 2009:203). Data testing was performed using IBM SPSS statistics 23. The operational definitions of each variable are shown in table 2.

Table 2. Operationalization of variables

Variable	Definition	Indicator
Carbon emissions disclosure	Corporate sustainability disclosure related to carbon emissions.	The number of valuation items disclosed by the company based on the carbon emissions disclosure index described in table 2.
Earnings	Earnings management proxied by the	$it = \alpha + \beta_1 \Delta Rit + \beta_2 \Delta Rit \times SIZE_{it} + \beta_3 \Delta Rit \times AGE_{it}$

management	conditional revenue model developed by Stubben, 2010. Conditional revenue model based on discretionary revenue which is the difference between actual changes in receivables and estimated changes in receivables based on the calculation model.	$+ \beta_4 \Delta Rit \times AGE_SQit + \beta_5 \Delta Rit \times GRR_Pit + \beta_6 \Delta Rit \times GRR_Nit + \beta_7 \Delta Rit \times GRMit + \beta_8 \Delta Rit \times GRM_SQit + \varepsilon it$ <p>it = Account receivable Rit = The difference between company income SIZE = Natural log of total year-end assets AGE = Natural log of company age (years) GRM = Gross margin SQ = Square of variable GRR_P = Adjusted growth revenue (= 0 if negative) GRR_N = Adjusted growth revenue (= 0 if positive) Δ = Annual change COMMSIZE = Number of commissioners in the company.</p>
The size of the board of commissioners	The board of commissioner as a supervisor who conducts oversight in general or specifically by the budget and provides input to the board of directors.	
The independent board of commissioners	According to Undang-Undang No. 40 Tahun, 2007 Perseroan Terbatas (UUPT) pasal 120 ayat (2), the independent commissioners in good corporate governance guidelines come from outside parties who are not affiliated with major shareholders, members of the Board of Directors and other members of the Board of Commissioners.	$COMMIND = \frac{\text{Number of an independent board of commissioners}}{\text{Number of all commissioners}} \times 100\%$
Institutional Ownership	Institutional ownership is the percentage of share ownership owned by the institution.	$INSOWN = \frac{\text{Number of share ownership}}{\text{Number of shares}} \times 100\%$
Audit Committee Meetings	Frequency of audit committee meetings conducted to carry out its responsibilities.	AUDIT = Number of meetings conducted by the audit committee in the current year.
Firm Size	The size of the company illustrates the company's resources.	SIZE = Natural log of total asset
Profitability	Companies' ability to use their capital to obtain revenue (Pahuja, 2009).	$ROA = \frac{\text{Net profit}}{\text{Total assets}} \times 100\%$
Leverage	The ratio used to measure the company's assets financed by long-term and short-term debt (Pahuja, 2009).	$\text{Debt Ratio} = \frac{\text{The total amount of debt}}{\text{Total assets}} \times 100\%$

Tabel 3. Carbon disclosure checklist

Category	Item	Item
Climate change: risks and opportunities	CC - 1	Assessment/description of the risks (regulatory, physical or general) relating to climate change and actions are taken or to be taken to manage the risks.
	CC - 2	Assessment/description of current (and future) financial implications, business implications and opportunities of climate change.
GHG emissions accounting	GHG - 1	Description of the methodology used to calculate GHG emissions (e.g. GHG protocol or ISO).
	GHG - 2	Existence external verification of quantity of GHG emission– if so by whom and on what basis.
	GHG - 3	Total GHG emissions – metric tonnes CO2-e emitted.
	GHG - 4	Disclosure of Scopes 1 and 2, or Scope 3 direct GHG emissions.

	GHG – 5	Disclosure of GHG emissions by sources (e.g. coal, electricity, etc.).
	GHG – 6	Disclosure of GHG emissions by facility or segment level.
	GHG - 7	Comparison of GHG emissions with previous years.
Energy consumption accounting	EC - 1	Total energy consumed (e.g. tera-joules or petajoules).
	EC - 2	Quantification of energy used from renewable sources.
	EC - 3	Disclosure by type, facility or segment.
GHG reduction and cost	RC - 1	Detail of plans or strategies to reduce GHG emissions
	RC – 2	Specification of GHG emissions reduction target level and target year
	RC – 3	Emissions reductions and associated costs or savings achieved to date as a result of the reduction plan
	RC – 4	Cost of future emissions factored into capital expenditure planning
Carbon emission accountability	ACC – 1	Indication of which board committee (or another executive body) has overall responsibility for actions related to climate change
	ACC - 2	Description of the mechanism by which the board (or another executive body) reviews the company's progress regarding climate change

Source: Choi et al., (2013)

4. Results and discussion

The descriptive statistical test serves to describe the object in this study including the minimum value, maximum value, average, and standard

deviation. Table 4 shows the results of descriptive statistical tests on the variable in this study.

Table 4. Descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
EM	60	-76.9053	15.4453	-24.50	10.953
CED	60	1	15	5.00	4.310
COMMSIZE	60	2	8	5.27	1.676
COMMIND	60	0.2000	0.6667	0.41	0.101
INSOWN	60	0.1397	0.9901	0.67	0.218
AUDIT	60	2	15	7.57	3.670
SIZE	60	14.0460	17.7504	15.97	0.984
ROA	60	0.0008	0.2078	0.08	0.046
LEV	60	0.0715	0.6637	0.35	0.153

The earnings management (EM) measured using conditional revenue model Stubben (2010). The calculation of earnings management conducted a regression test on each proxy to obtain the coefficient value in calculating earnings management. Furthermore, the minimum value of earnings management is -76.9053 and the maximum value is 15.4453 with a standard deviation of 10.953. A higher standard deviation than the average of 24.50 indicates that the data distribution is normal.

The carbon emissions disclosure (CED) as the dependent variable in this study was assessed by the dichotomy score 1 if disclosed and 0 if not disclosed. Disclosure of carbon emissions assessed by the carbon disclosure project (CDP) disclosure checklist, consists of 18 disclosure items. Furthermore, a minimum value for the level of carbon emission disclosure is obtained, a maximum value of 15, an average of 5.00 and a standard deviation of 4.310. The largest level of

carbon emissions disclosure is owned by Indocement Tunggal Prakarsa Tbk.

The size of the board of commissioners (COMMSIZE) as a moderating variable in this study measured by the number of members of the board of commissioners in a company. The maximum value for the board of commissioner's size is 8, the minimum value is 2, the average value is 5.27, and the standard deviation is 1.676. The smallest size of the board of commissioners is owned by Sawit Sumbermas Sarana Tbk. While the largest is owned by PP London Sumatra Indonesia Tbk and Blue Bird Tbk.

The independent board of commissioners (COMMIND) measured by the number of independent boards of commissioners divided by the total number of boards of commissioners. Thus, the minimum value obtained for the size of the independent board of commissioners is 0.2000, a maximum value of 0.6667, an average of 0.41 and a standard deviation of 0.101. Semen Baturaja (Persero) Tbk has the smallest board size, while the largest is owned by Sampoerna Agro Tbk.

Institutional ownership (INSOWN) in this study measured by dividing the number of shares owned by the institution with the number of shares of the company in circulation. The minimum and maximum values for institutional ownership are 0.1397 and 0.9901, respectively. The lowest level of institutional ownership is owned by Arwana Citramulia Tbk. While the highest is owned by Semen Indonesia (Persero) Tbk. The average value of institutional ownership is 0.67 and the standard deviation is 0.218. A lower than average standard deviation indicates that the diversity of institutional ownership data is relatively low.

Audit committee meetings (AUDIT) measured by the number of meetings conducted by the audit committee annually, with an average of 7.57. The minimum and maximum values are 2 and 15. The lowest number of audit committee meetings are owned by Blue Bird Tbk and the

highest is Ashashimas Flat Glass Tbk. Meanwhile, this variable has a standard deviation of 3.670.

The firm size (SIZE) as a control variable in this study measured using the natural log of total assets. The minimum and maximum values of company size are 14.0460 and 17.7504, respectively. This variable has an average value of 15.97 and a standard deviation of 0.984. The smallest company size is owned by Arwana Citramulia Tbk, while the largest is owned by Semen Indonesia (Persero) Tbk.

The profitability measured by using the return on assets (ROA), has an average value of 0.08 while a standard deviation value of 0.046. A smaller standard deviation compared to the average indicates that there is no large gap between the minimum and maximum values of the company's profitability. The minimum and maximum values for each of these variables are 0.0008 and 0.2078. The company with the lowest level of profitability is owned by Sampoerna Agro Tbk and the highest is owned by Arwana Citramulia Tbk.

The next control variable in this study is leverage with an average value of 0.35. Meanwhile, for the standard deviation, the minimum and maximum values for this variable are 0.153, 0.0715, and 0.6637, respectively. Japfa comfeed Indonesia Tbk has the highest and the lowest leverage level owned by Semen Baturaja (Persero) Tbk.

This study uses two regression models. The first regression model was used to test hypothesis 1. Meanwhile, the second model was used to test hypotheses 2,3,4 and 5. In the classical assumption test, it was found that the normality test data was normally distributed with a significance level in the two regression models built by 0.200 or more greater than 0.05. The regression models do not show the problem of heteroskedasticity and multicollinearity. Based on the regression test results, the analysis results are obtained as follows:

Table 5. Results of regression analysis without moderation

Variable	Coefficient	t-count	Sig.
EM	0.085	2.462	0.017*
SIZE	1.340	3.903	0.000*
ROA	4.161	0.426	0.672
LEV	-3.298	-1.188	0.240
Constanta	-4.657	-1.467	0.148

**Sig. at level 0.05 (p<0.05)

Notes:

Model 1: $CED = \alpha + \beta_1EM + \beta_2SIZE + \beta_3ROA + \beta_4LEV + e$

EM= earnings management, SIZE= firm size, ROA= profitability, LEV= leverage.

Table 6. Results of moderation regression analysis

Variable	Coefficient	t-count	Sig.
EM	0.298	3.688	0.001*
COMMSIZE	-1.061	-2.125	0.039
COMMIND	1.331	0.260	0.796
INSOWN	-1.689	-0.448	0.656
AUDIT	0.137	0.584	0.562
EM*COMMSIZE	-0.041	-3.159	0.003*
EM*COMMIND	-3.613	-0.278	0.782
EM*INSOWN	4.200	0.250	0.803
EM*AUDIT	-132.624	-0.619	0.539
SIZE	2.623	4.393	0.000*
ROA	6.817	0.665	0.509
LEV	-3.565	-1.115	0.270
Constanta	-10.325	-2.190	0.034

**Sig. at level 0.05 (p<0.05)

Notes:

Model 2: $CED = \alpha + \beta_1EM + \beta_2COMMSIZE + \beta_3COMMIND + \beta_4INSOWN + \beta_5AUDIT + \beta_6EM*COMMSIZE + \beta_7EM*COMMIND + \beta_8EM*INSOWN + \beta_9EM*AUDIT + \beta_{10}SIZE + \beta_{11}ROA + \beta_{12}LEV + e$

EM= earnings management, COMMSIZE= the size of the board of commissioner's, COMMIND= the independent board of commissioners, INSOWN= institutional ownership, AUDIT= audit committee meetings, EM*COMMSIZE= interaction of earnings management with the size of the board of commissioners, EM*COMMIND= interaction of earnings management with the independent board of commissioners, EM*INSOWN= interaction of earnings management with institutional ownership, EM*AUDIT= interaction of earnings management with audit committee meetings, SIZE= firm size, ROA= profitability, LEV= leverage.

The effect of profit management on carbon emission disclosures

The results of hypothesis 1 (table 5), statistically show a significance of 0.017 with a positive coefficient value. This result showed that H₁ accepted. Management that practices earnings management uses carbon emission disclosures to protect its interests and divert stakeholders' awareness of management performance. The results support the agency theory's assumptions which emphasize that basically, humans tend to be selfish (self-interest) and avoid risk. When the company is managed by someone or a group of people who are not the owner, then the party will

not work for the benefit of the owner. On the other hand, companies must provide benefits for stakeholders that have an impact on the company's survival.

One of them is the demands of stakeholders in controlling social and environmental issues such as carbon emissions. In addition, the results of the research support the stakeholder theory states that when information asymmetry gets higher because management tries to meet the demands of stakeholders, so management tends to be involved in earnings management. The strength of stakeholders and financial

performance is related to the level of disclosure (Roberts, 1992).

The results of this study support the research of Prior et al., (2008); Velayutham (2014); and Gavana et al., (2017) state that disclosure of social responsibility is used to cover earnings management actions that will have a direct impact on stakeholders. The increase of carbon emissions disclosure used to create an image that the company has good ethics behind the personal interests of management. Carbon emissions disclosure provides a positive image that will affect the company's reputation (Kim et al., 2012). The disclosure of carbon emissions used by management to cover up their mistakes, so the company can operate with a good reputation (Hemingway & Maclagan, 2014).

The role of corporate governance as a moderating variable

The result of regression test of earnings management interaction variables with the size of the board of commissioners on the disclosure of carbon emissions can be seen in the table 6. It shows that H_{2a} accepted with a significant negative coefficient. The board of commissioners is proven to be a moderating variable by weakening the effect of earnings management on the disclosure of carbon emissions. Increasing the number of commissioners in a company can strengthen the negative influence of earnings management on the disclosure of carbon emissions.

The higher the level of earnings management moderated by the size of the board of commissioners, the lower the level of carbon emissions disclosure. This shows that the board of commissioners has a role in influencing the disclosure of carbon emissions whose level of disclosure is not only used as a symbolic form by management in covering the opportunist actions taken.

This study supports the results of previous studies in Prasetya & Marsono (2015);

Kusumawati & Nurharjanti (2019) who found that the board of commissioners could carry out the function of monitoring the earnings management practices so that the disclosure of carbon emissions was carried out voluntarily. The results of the study are in line with agency theory which states that good corporate governance mechanisms are supported by the greater size of the board of commissioners so that it can demonstrate corporate transparency through disclosure of carbon emissions. Carbon emissions disclosure not only carried out as a form of fulfillment in diverting stakeholder's attention.

Table 6 shows that H_{2b} is rejected with a negative coefficient of 0.782. This result can be influenced by the possibility that the existence of an independent board of commissioners is only used to meet the demands of the regulation but does not have the aim to improve good corporate governance in the company. The results of the study contradict Machmuddah et al., (2017) who found that the increasing proportion of the independent board of commissioners would improve the supervisory function to weaken the positive influence of earnings management on disclosure of carbon emissions.

In addition, this result is certainly not in line with agency theory which explains that an independent board of commissioners carries out a monitoring function on management performance to disclose relevant financial and non-financial performance information. On the other hand, the results of this study are in line with Hermiyetti & Manik (2013) that the proportion of the independent board of commissioners does not carry out the supervisory function so that the majority shareholders have a greater role in controlling the activities of the company.

Table 6 indicates that H_{2c} is rejected with a positive coefficient of 0.803. The absence of a moderating role in institutional ownership in this study could be due to institutional ownership not playing an effective role in carrying out the monitoring function of earnings management

practices and disclosure of carbon emissions. This research is in line with Kusumaningtyas & Farida (2015) which shows that institutional owners tend to focus on short-term earnings, so management is forced to manipulate earnings. The results of this study contradict the findings Akbas & Canikli (2018) that companies with higher levels of institutional ownership tend to disclose carbon emissions. Institutional investors are involved in monitoring accounting policy choices made by management to reduce earnings management practices (Ajay & Madhumati, 2015).

Table 6 shows H_{2d} is rejected with a negative coefficient of 0.539. This result can be influenced by the possibility that the audit committee holds a meeting to discuss the interests of the company which is urgent compared to overseeing management. This study is in line with Choi et al., (2004); and Leksono & Butar (2018) which states that audit committee meetings cannot find errors in accounting practices by management and affect the level of carbon emissions disclosure. The results of this study contradict Sun et al., (2010); and Chariri et al., (2018) who found that audit committee members meet at least 5 times a year to improve the quality of carbon emissions disclosure and financial reporting better.

Moreover, this study found that firm size has a positive and significant effect on carbon emissions disclosure. The results are in line with Velayutham (2014); and Faisal et al., (2018) which states that companies with greater levels of visibility and resources have intensive efforts to overcome environmental problems and tend to disclose carbon emissions information voluntarily. Profitability does not affect carbon-emissions disclosure. This result showed that financial performance not always be considered in assessing the company's carbon emissions disclosure.

Conversely, companies with high profitability do not increase the disclosure of carbon emissions information to demonstrate

good financial performance (Pradini & Kiswara, 2013). These results are not in line with previous research conducted by Faisal et al., (2018) which shows that companies with high profitability tend to disclose carbon emissions information.

Moreover, the leverage does not affect the disclosure of carbon emissions, because the company has gained good trust from debtholders. Thus, the company feels no need to disclose carbon emissions. This result is contrary to Faisal et al., (2018) which states that disclosure of carbon emissions information is done by companies to increase the credibility of debtholders. Furthermore, the results of this study contradict with the agency theory which states that the independent board of commissioners has a role in carrying out the monitoring function of management performance to disclose relevant financial and non-financial performance information.

5. Conclusions

This study aims to examine the effect of earnings management on carbon emissions disclosure by corporate governance mechanisms as moderating variables in the basic industrial and chemical, agricultural, energy, and transportation sectors listed on the Indonesia Stock Exchange. The results of this study provide empirical evidence that earnings management has a significant positive effect on carbon emissions disclosure.

In addition, this study shows that the board of commissioners has a role in strengthening the negative influence of earnings management on carbon-emissions disclosure. The board of commissioners has a role in influencing carbon emissions disclosure which is not only used as a symbolic form to cover earnings management actions.

The independent board of directors has no role in influencing earnings management on carbon-emissions disclosure. The role of the independent board of commissioners in carrying

out monitoring function, not comparable to the majority shareholders who have more control in monitoring management activities.

This study provides evidence that the level of institutional ownership does not play a role in the effect of earnings management on disclosure of carbon emissions because institutional owners do not play an effective role in carrying out monitoring functions on management performance.

Moreover, the audit committee meetings cannot either weaken or strengthen the relationship of earnings management with disclosure of carbon emissions because oversight of management performance is less of a concern on the agenda of meetings conducted by the audit committee. Thus, this research has proven that disclosure of carbon emissions can be used by companies to shift the awareness of stakeholders to the existence of earnings management practices in a company.

This research has several contributions both theoretically, practically, and in the policy. The theoretical contribution of this study provides support for the application of agency theory with the acceptance of the first hypothesis, namely the positive effect of earnings management on disclosure of carbon emissions. The findings support the stakeholder theory which states that when information asymmetry gets higher, management tends to be involved in earnings management to meet the demands of stakeholders.

Second, the results can be used as a reference for companies included in the basic industrial and chemical, agricultural, energy, transportation sectors to be able to review the functions of each aspect of corporate governance to achieve effective implementation of good corporate governance, which of course will affect management performance and improve the quality of carbon-emissions disclosure.

Third, this research is expected to be able to make policy contributions to the government as

the main regulator in Indonesia to establish laws that specifically regulate accounting standards that guide the preparation of financial statements and protect the interests of the general public, particularly investors and creditors.

This study also has limitations, including the small number of samples and the possibility of subjectivity in assessing carbon emissions disclosure based on the interpretations of researchers. Future studies are expected to provide evidence of disclosure of carbon emissions in other business sectors, for instance mining industries.

References

- Aggarwal, R., & Dow, S. (2011). Greenhouse gas emissions mitigation and firm value: a study of large north-American and European firms. *SSRN Electronic Journal*, 1–37. <https://doi.org/10.2139/ssrn.1929453>
- Ajay, R., & Madhumati, R. (2015). Institutional ownership and earnings management in India. *Indian Journal of Corporate Governance*, 8(2), 119–136.
- Akbas, H. E., & Canikli, S. (2018). Determinants of voluntary greenhouse gas emission disclosure: an empirical investigation on Turkish firms. *Sustainability MDPI*, 11(1).
- Al-Zyoud, A. A. (2012). The effects of chairman independence and ownership structure on earnings management. *World Applied Sciences Journal*, 17(8), 934–940.
- Albersmann, B. T., & Hohenfels, D. (2017). Audit committees and earnings management – evidence from the German two-tier board system. *Schmalenbach Business Review*, 18(2), 147–178.
- Allegrini, M., & Greco, G. (2013). Corporate boards, audit committees and voluntary disclosure: evidence from Italian Listed Companies. *Journal of Management Governance*, 17(1), 187–216.
- Anderson, C. R., Mansi, S. A., & Reeb, D. M. (2004). Board characteristics, accounting report integrity, and the cost of debt. *Journal of Accounting and Economics*, 37(3), 315–342.

- Appuhami, R., & Tashakor, S. (2017). The impact of audit committee characteristics on CSR disclosure: an analysis of Australian firms. *Australian Accounting Review*, 27(4), 1–21.
- Attig, N., Cleary, S., Ghoul, S. E., & Guedhami, O. (2012). Institutional investment horizon and investment–cash flow sensitivity. *Journal of Banking & Finance*, 36(4), 1164–1180.
- Bansal, S., Lopez-Perez, M. V., & Rodriguez-Ariza, L. (2018). Board independence and corporate social responsibility disclosure: the mediating role of the presence of family ownership. *Administrative Sciences*, 8(3), 33–54.
- Bapepam-LK. (2002). *Surat edaran ketua Bapepam no. SE-02/PM/2002 tentang pedoman penyajian dan pengungkapan laporan keuangan emiten atau perusahaan publik*. Kementerian Keuangan Republik Indonesia.
- Blanco, C., Caro, F., & Corbett, C. J. (2017). An inside perspective on carbon disclosure. *Business Horizons*, 60(5), 635–646.
- Borghesi-Ghomi, Z., & Leung, P. (2013). An empirical analysis of the determinants of greenhouse gas voluntary disclosure in Australia. *Sciedu Press*, 2(1). <https://doi.org/10.5430/afr.v2n1p110>
- Brower, J., & Mahajan, V. (2013). Driven to be good: a stakeholder theory perspective on the drivers of corporate social performance. *Journal of Business Ethics*, 117, 313–331.
- Buerter, E., Sun, E., Lee, J. S., & Hwang, J. (2019). Corporate social responsibility and earnings management: the moderating effect of corporate governance mechanisms. *Corporate Social Responsibility and Environmental Management*, 1–16.
- Callery, P. J., & Perkins, J. (2017). *Unmasking symbolic management: evidence from voluntary corporate carbon disclosures*. University of California.
- Chariri, A., Januarti, I., & Yuyetta, E. N. (2018). Audit committee characteristics and carbon emission disclosure. *E3S Web of Conferences*.
- Chen, Y. C., Elder, R. J., & Hsieh, Y.-M. (2007). Corporate governance and earnings management: The implications of corporate governance best-practice principles for Taiwanese listed companies. *Journal of Contemporary Accounting & Economics*, 3(2), 73–105.
- Choi, B. B., Lee, D., & Psaros, J. (2013). An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review*, 25(1), 58–79.
- Choi, J., Jeon, K., & Park, J. (2004). The role of audit committees in decreasing earnings management: Korean evidence. *International Journal Accounting, Auditing and Performance Evaluation*, 1(1), 37–60.
- Coburn, J., Donahue, S. H., & Jayanti, S. (2011). Disclosing climate risks & opportunities in SEC filings: A guide for corporate executives, attorneys & directors. *Ceres, February*. <http://www.ceres.org/resources/reports/disclosing-climate-risks-2011/view>
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*, 13(1), 1–36.
- Elyasih, J., Tang, Q., & Len, Y.-C. (2018). Corporate governance and carbon transparency: Australian experience. *Accounting Research Journal*, 31(3), 405–422.
- Faisal, F., Andiningtyas, E. D., Achmad, T., Haryanto, H., & Meiranto, W. (2018). The content and determinants of greenhouse gas emission disclosure: Evidence from Indonesian companies. *Corporate Social Responsibility and Environmental Management*, 1–10.
- FCGI. (2001). Peranan dewan komisaris dan komite audit dalam pelaksanaan corporate governance (tata kelola perusahaan). *Forum for Corporate Governance in Indonesia*.
- Fransiska, Y., Endang, R. A., & Purwanto, N. (2016). Pengaruh kepemilikan institusional, kepemilikan manajerial, dan kebijakan dividen terhadap kebijakan hutang pada perusahaan manufaktur yang terdaftar di bursa efek Indonesia tahun 2012-2014. *Jurnal Riset Mahasiswa Akuntansi Unikama*, 4(1).

- Freeman, R. E. E. al. (2010). *Stakeholder theory- the state of the art*. Cambridge University Press.
- Gavana, G., Gottardo, P., & Maoisello, A. M. (2017). Earnings management and csr disclosure. Family vs. non-family firms. *Sustainability MDPI*, 9(12), 1–21.
- Ghozali, I. (2009). *Aplikasi analisis multivariate dengan program SPSS*. UNDIP.
- Haniffa, R. M., & Cooke, T. E. (2002). Culture, corporate governance and disclosure in Malaysian corporations. *A Journal of Accounting, Finance, and Business Studies ABACUS*, 38(3), 317–349. <https://doi.org/10.1111/1467-6281.00112>
- Hemingway, C. A., & Maclagan, P. W. (2014). Managers' personal values as drivers of corporate social responsibility. *Journal of Business Ethics*, 50(1), 33–44.
- Hermiyetti, & Manik, E. N. (2013). The influence of good corporate governance mechanism on earnings management: empirical study in Indonesian stock exchange listed company for periods of 2006-2010. *Indonesian Capital Market Review*, 5(1), 52–63.
- Hope, O. K., Thomas, W. B., & Vyas, D. (2013). Financial reporting quality of U.S private and public firms. *The Accounting Review*, 88(5), 1715–1742.
- IICG. (2015). *Corporate governance perception index*. <http://www.iicg.org/agenda-iicg/21-corporate-governance-perception-index> (accessed February 10 2019)
- Khan, H. (2011). A literature review of corporate governance. *International Conference on E-Business, Management and Economics IPEDR*.
- Kilic, M., & Kuzey, C. (2018). The effect of corporate governance on carbon emission disclosures: evidence from turkey. *International Journal of Climate Change Strategies and Management*, 33(1), 115–144.
- Kim, Y., Park, M. S., & Wier, B. (2012). Is earnings quality associated with corporate social responsibility? *The Accounting Review*, 87(3), 761–796.
- Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33, 375–400.
- Kusumaningtyas, M., & Farida, D. N. (2015). Pengaruh kompetensi komite audit, aktivitas komite audit dan kepemilikan institusional terhadap manajemen laba. *Jurnal Akuntansi Indonesia*, 4(1), 66–82.
- Kusumawati, E., & Nurharjanti, N. N. (2019). Manajemen laba, pengungkapan corporate social responsibility (csr) dengan corporate governance sebagai variabel moderasi. *The 9th University Research Colloquium*, 163–173.
- Leksono, A. A., & Butar, S. B. (2018). Pengaruh good corporate governance dan karakteristik perusahaan terhadap pengungkapan corporate social responsibility. *Jurnal Akuntansi Bisnis*, 16(1), 1–18.
- Liao, L., Luo, L., & Tang, Q. (2014). Gender diversity, board independence, environmental committee and greenhouse gas disclosure. *The British Accounting Review*, 4(4), 409–424.
- Machmuddah, Z., Syafruddin, M., Muid, D., & Utomo, S. D. (2017). Manajemen laba, pengungkapan lingkungan perusahaan dan mekanisme tata kelola perusahaan. *Jurnal Dinamika Akuntansi Dan Bisnis*, 4(1), 55–72.
- Mansor, N., Che-Ahmad, A., Ahmad-Zaluki, N. A., & Osman, A. H. (2013). Corporate governance and earnings management: A study on the Malaysian family and non-family owned PLCs. *Procedia Economics and Finance*, 7, 221–229.
- Messier, W. F., Glover, S. M., & Prawitt, D. F. (2008). *Auditing & assurance services: a systematic approach* (Sixth). The Mc Graw-Hill Companies, Inc.
- Nainggolan, N. E., & Rohman, A. (2015). Pengaruh struktur corporate governance terhadap pengungkapan lingkungan. *Diponegoro Journal of Accounting*, 4(2), 1-9.
- Nasih, M., Harymawan, I., Paramitasari, Y. I., & Handayani, A. (2019). Carbon emissions, firm size, and corporate governance structure: evidence from the mining and agricultural industries in Indonesia. *Sustainability MDPI*, 11(9), 1–14.
- Neu, D., Warsame, H., & Pedwell, K. (1998). Managing public impressions: environmental disclosures in annual report. *Accounting, Organizations and Society*, 23(3), 265–282.

- Neviana. (2010). *Triple bottom line: lebih dari sekadar profit*. Swa.Co.Id. <https://swa.co.id/swa/my-article/triple-bottom-line-lebih-dari-sekadar-profit> (accessed January 26 2019).
- Nugroho, B. Y., & Eko, U. (2011). Board characteristics and earnings management. *Journal of Administrative Science & Organization*, 18(1), 1–10.
- Obigbemi, I. F., Omolehinwa, E. O., Mukoro, D O Ben-Caleb, E., & Olusanmi, O. A. (2016). Earnings management and board structure: evidence from Nigeria. *SAGE Open*, 6(3), 1–15.
- Panda, B., & Leepsa, N. M. (2017). Agency theory: review of theory and evidence on problems and perspectives. *Indian Journal of Corporate Governance*, 10(1), 74–95.
- Pradini, H. S., & Kiswara, E. (2013). The analysis of information content towards greenhouse gas emissions disclosure in Indonesia's companies. *Diponegoro Journal of Accounting*, 2(2), 1–12.
- Prasetya, D., & Marsono. (2015). Analisis pengaruh manajemen laba terhadap pengungkapan corporate social responsibility dengan corporate governance sebagai variabel moderasi. *Diponegoro Journal of Accounting*, 4(1), 1–12.
- Prior, D., Surroca, J., & Tribo, J. A. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate Governance: An International Review*, 16(3), 160–177.
- Peraturan presiden nomor 71 tahun 2011 tentang penyelenggaraan inventarisasi gas rumah kaca nasional, (2011).
- Peraturan presiden republik indonesia nomor 61 tahun 2011, 1 (2011).
- Roberts, R. W. (1992). Determinants of corporate social responsibility disclosure: an application of stakeholder theory. *Accounting Organizations and Society*, 17(6), 595–612.
- Rupley, K. H., Brown, D., & Marshall, R. S. (2012). Governance, media and the quality of environmental disclosure. *Journal of Accounting and Public Policy*, 31(6), 610–640.
- Saleh, N. M., Iskandar, T. M., & Rahmat, M. M. (2007). Audit committee characteristics and earnings management: evidence from Malaysia. *Asian Review of Accounting*, 15(2), 147–163.
- Salewski, M., & Zulch, H. (2014). The association between corporate social responsibility and earnings quality. *HHL Working Paper Series*.
- Scott, W. R. (2015). *Financial accounting theory* (Seventh). Pearson.
- Smith, A. (1937). *An inquiry into the nature and causes of the wealth of nations*. The Modern Library.
- Soliman, M. M., & Ragab, A. A. (2014). Audit committee effectiveness, audit quality and earnings management: an empirical study of the listed companies in Egypt. *Research Journal of Finance and Accounting*, 5(2), 155–166.
- Sun, N., Salama, A., Hussainey, K., & Habbash, M. (2010). Corporate environmental disclosure, corporate governance and earnings management. *Managerial Auditing Journal*, 25(7), 679–700.
- UNFCCC. (1988). *Kyoto Protocol to the unites nations framework convention on climate change*.
- Velayutham, E. (2014). Voluntary disclosure of greenhouse gas emissions, corporate governance and earnings management: Australian evidence. In *Tesis*. University of Southern Queensland. Australia.
- Wood, D., & Ross, D. G. (2006). Environmental social controls and capital investments: Australian evidence. *Accounting and Finance*, 46, 677–695.
- World Resources Institute. (2015). *A global look at mandatory greenhouse gas reporting programs*. <http://www.wri.org/blog/2015/05/global-look-mandatory-greenhouse-gas-reporting-programs>
- Zhou, Z., Zhou, H., Peng, D., Chen, X., & Li, S. (2018). Carbon disclosure, financial transparency, and agency cost : evidence from Chinese manufacturing listed companies. *Emerging Markets Finance and Trade*, 54(12), 2669–2686.