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DO ENVIRONMENTAL AND FINANCIAL PERFORMANCES AFFECT ENVIRONMENTAL DISCLOSURES? EVIDENCE FROM LISTED COMPANIES IN INDONESIA

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Received 14 April 2020; accepted 10 October 2020; published 30 December 2020

Abstract. The number of companies in Indonesia that have participated in environmental-related activities continues to grow. Some of these companies have also engaged and implemented an assessment program called Program for Pollution Control, Evaluation, and Rating (PROPER). This assessment program was initially launched by the Indonesian Ministry of Environment in 1995 to measure and rate the environmental performance of companies in Indonesia. They have also administered an environmental management system as part of their environmental protection initiatives. However, the level of environmental disclosure by these companies is still low. This may occur due to the current situation in which the companies are not obliged to incorporate environmental disclosures on their annual reports. For those companies that disclose their environmental performance, there is also no apparent reason on why they have done that. This research aims to examine the effect of environmental performance, company financial performance, and company characteristics on environmental disclosure. The population used in this research comprised of all registered non-financial companies in the Indonesia Stock Exchange in 2014–2016. The sample was selected using a purposive sampling method to obtain 36 sample companies and analyzed through multiple regression analysis. Results show that the environmental performance variable, which is described by PROPER ratings and environmental management systems, and company size variable, both affect the extent of environmental disclosures. However, the financial performance variable, which is described by companies' profitability and leverage, and the number of board commissioners variable, both do not significantly affect the extent of environmental disclosures.

Keywords: environmental disclosure; environmental performance; financial performance; company characteristics; PROPER; Indonesia; listed companies

Reference to this paper should be made as follows: Wahyuningrum, I.F.S., Budihardjo, M.A., Muhammad, F.I., Djajadikerta, H.G., Trireksani, T. 2020. Do environmental and financial performances affect environmental disclosures? Evidence from listed companies in Indonesia. *Entrepreneurship and Sustainability Issues*, 8(2), 1047-1061. [http://doi.org/10.9770/jesi.2020.8.2\(63\)](http://doi.org/10.9770/jesi.2020.8.2(63))

JEL Classifications: Q56, M14, E16

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1. Introduction

Climate change and global warming are issues that have been widely explored. Surrounded by these issues, companies are obliged to participate in exploring and protecting the environment because the environment is the facilitator of a business organization (Sen, Mukherjee & Pattanyak, 2011). One of the efforts that can be made by companies around the world as a form of attention and commitment to protecting the environment is conducting environmental disclosures. Corporate environmental disclosure is a process of communicating information related to environmental activities, which are commonly done through various types of media, such as annual reports, stand-alone sustainability reports, or company websites (Bhatia & Makkar, 2019; Djajadikerta and Trireksani, 2012; Inekwe, Hashim & Yahya, 2020; Ismail, Rahman & Hezabr, 2018; Lu & Taylor, 2016; Ong & Djajadikerta, 2018; Sharma, 2019; Zhang, Djajadikerta & Zhang, 2018).

In relation to sustainability reporting standards, nonprofit organizations that echo the importance of environmental sustainability have formed an initiative called the global reporting initiative (GRI). GRI was first established by the Coalition for Environmentally Responsible Economies in Boston, United States, in 1997. This organization initially established standard guidelines for sustainability reporting with six items of disclosure indicators: economy, environment, employment practices and work convenience, human rights, society, and responsibility for products. It has since made several revisions and developed more comprehensive guidelines (Bidari & Djajadikerta, 2020).

Environmental performance affects the extent to which environmental disclosure and its impact will become a company risk (Cormier and Magnan, 1999). According to Cho and Patten (2007), companies can gain legitimacy by providing their environmental disclosure. Additionally, participating in external environmental performance assessments is another way for companies to gain legitimacy. The premise is that companies with an adequate level of environmental performance have more opportunity and may have a tendency to provide a higher level of environmental disclosure. However, many prior studies have revealed inconsistent results of the relationship between environmental performance and environmental disclosure (Ong, Trireksani & Djajadikerta, 2016). Some studies found a positive correlation between environmental performance and environmental disclosure (e.g., Plumlee et al., 2015; Purwantini et al., 2019), while some others showed a negative correlation (e.g., Patten, 2002).

Former studies also point out numerous outcomes on the relationship between company financial performance and the extent of environmental disclosure. Some results indicated a positive or negative correlation, and some of them initiate no correlation (Elijido-Ten, 2007; Lima Crisóstomo, de Souza Freire & Cortes de Vasconcellos, 2011). Many researchers investigated the correlation between company characteristics (such as type of industry, firm size, company age, etc.) and environmental discussion, and most of the results found that they are significantly related (Branco & Rodrigues, 2008). Larger companies tend to be more provide comprehensive information about their environmental activities and more visible to external audiences and their stakeholders (Liu & Anbumozhi, 2009). It can be said large companies may increase their reputation by communicating their environmental disclosure to the public (Branco & Rodrigues, 2008).

Currently, there are no regulations requiring Indonesian companies to disclose their environmental activities or performance (Devie et al., 2019). Some studies show that the environmental disclosure practice conducted by Indonesian companies is still relatively low. A study by Trireksani and Djajadikerta (2016), for example, indicates that the extent of environmental disclosures made by the listed mining companies in Indonesia was merely moderate. Another study by the Center for Governance, Institutions, and Organizations of the National University

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of Singapore Business School, using the GRI index, revealed that the quality of CSR implementation, which includes environmental disclosure, by Indonesian companies, was relatively lower than those of most of the other Southeast Asian nations (Suastha, 2016). This may occur due to the fact that reporting on environmental performance in Indonesia is still voluntary.

In 2002, however, the Indonesian government, through its Ministry of the Environment, developed a nationwide evaluation program, namely, Program for Pollution Control, Evaluation, and Rating (PROPER) (Deswanto & Siregar, 2018; Sulaiman, Abdullah & Fatima, 2014). PROPER is an assessment of environmental performance by companies carried out by the Indonesian government. This program aims to increase awareness and efforts of companies to preserve the environment. PROPER has five rankings, namely, gold, green, blue, red, and black, which respectively represent exceptional, excellent, good, bad, and poor rating given to companies based on their performance and environmental disclosures.

This study aims to examine the effect of environmental performance, financial performance, and company characteristic on environmental disclosure within the Indonesian listed companies context by utilizing its national PROPER instrument and the inclusion of ISO 14001 certification as one of the explanatory variables. An environmental management system is a part of the overall management system that includes organizational structure, responsibilities, implementation, procedures, and resources to develop, implement, achieve, evaluate, and maintain environmental policies (ISO 14001, 2004). A good or poor environmental management system of a company can be described by ISO 14001 certification. Companies with this certification indicate that they already have a good environmental management system. Therefore, ISO 14001 certification can be considered one of the proxies in assessing the environmental performance of a company. The findings of this study are expected to assist in the decision-making process related to environmental disclosure as initiated by companies, investors, and regulators. Furthermore, our results are expected to enrich knowledge related to environmental disclosures.

This paper is divided into several sections. Section 2 presents the conceptual background and hypothesis development. Section 3 describes the research method, Section 4 discusses the findings, and Section 5 presents conclusion and limitations.

2. Literature review and hypotheses development

2.1 Literature review

Stakeholder theory states that a company has responsibilities involving several parties, including shareholders and other stakeholders (Freeman et al., 1984). This theory assumes that stakeholders determine the existence of a company. As such, it needs to maintain relationships with stakeholders and avoid disrupting the achievement of company goals. Companies should focus on the environment and long-term sustainable development (Elsayih, Tang & Lan, 2018). One of the efforts to maintaining relationships with stakeholders that can be carried out by a company is providing environmental disclosure (Huang & Kung, 2010). The companies can use environmental disclosure as a means to connect to their stakeholders.

According to legitimacy theory, there is a “social contract” between companies and the society (Deegan, 2000), which leads to the companies disclosing their social and environmental report voluntarily (Luo, Tang & Lan, 2013). Therefore, company managements are expected to provide and disclose their companies’ corporate social responsibility activities to the public (Archel et al., 2009; Zhang, Djajadikerta & Trireksani, 2019). Nowadays, the legitimacy theory has become an important theory in environmental disclosure studies that indicates that companies use environmental disclosure as one of their tools to keep their legitimacy.

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2.2. Environmental performance

The environmental performance of a company in Indonesia can be revealed by PROPER ratings and environmental management systems. PROPER is a rating system that can indicate a good or bad environmental performance of a company based on the assessment by the Ministry of the Environment. Accordingly, companies with better PROPER ratings could be more easily make more significant environmental disclosures than companies with lower PROPER ratings. Some previous studies have found evidence that the PROPER ranking affects environmental disclosures (Deswanto & Siregar, 2018; Pradini & Kiswara, 2013; Prasetya & Yulianto, 2018; Sulaiman, Abdullah & Fatima, 2014)

Similarly, some companies apply and seek ISO 14001 certification to show that their companies have an excellent environmental management system. Companies that use ISO 14001 on environmental management systems tend to enhance environmental disclosure because they want to show the results of their environmental performance to stakeholders. Some previous studies (Nurhayati, Taylor & Tower, 2015; Yusoff Othman & Yatim, 2013) found a significant relationship between environmental management systems and environmental disclosures. This study proposes the following hypotheses:

- H1:** Companies with better PROPER ratings would have a higher environmental disclosure than companies with poorer PROPER ratings.
- H2:** Companies with better environmental management systems would make a greater extent of environmental disclosure than companies with poorer environmental management systems.

2.3. Financial Performance

Financial performance is a measure that can be used to describe the performance of companies in the financial sector. The theory of stakeholders explains that companies are responsive not only to shareholders but also to other stakeholders and the environment. Companies need to carry out activities that can be used to show their responsibilities to stakeholders, and one of them is by providing environment disclosure. The financial performance of a company can be described on the basis of profitability and leverage ratios.

Profitability is a ratio that describes a company's ability to generate profits by using its resources. Companies with a high profitability level likely present a high environment disclosure because profitable companies tend to have more resources to do environmental disclosure. Large resource ownership can be used to show a company's contribution to the environment to reduce social pressure from a community and give a positive impression to stakeholders (Giannarakis, 2014; Ismail et al., 2018). Some previous studies revealed the positive influence of profitability to environmental disclosure (Kansal, Joshi & Batra, 2014; Lu & Abeysekera, 2014; Muttakin & Khan, 2014).

Leverage is a ratio that can describe a company's ability to pay off its debts. Companies with a high leverage level possibly have a great extent of environmental disclosures because companies with high debts need to make other performance disclosures as a form of information that a company is in good condition. Furthermore, companies with a high leverage degree have a large-interest-bearing capital so that the existence of companies depends on lenders. This risk encourages companies to provide evidence of disclosure as a form of concern for the environment (Sulaiman et al., 2014). Some previous studies (Ismail et al., 2018; Yanto & Muzzammil, 2016) found that leverage positively affects environmental disclosure. This study proposes the following hypotheses:

- H3:** Companies with higher levels of profitability would provide a greater extent of environmental disclosure than companies with lower levels of profitability.

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H4: Companies with higher levels of leverage would provide a greater extent of environmental disclosure than companies with lower levels of leverage.

2.4. Company characteristic

Legitimacy theory explains that companies try to ensure that activities are in accordance with norms and rules and accepted by outsiders (Elsayih et al., 2018). Furthermore, operational activities are in a frame, and norms exist in a society and the environment where a company is located; one of these activities that is relevant to this study is environmental disclosure. Companies use environmental-related performance and disclosure to justify a company's operations without endangering the environment (Liao, Luo & Tang, 2015).

One of the characteristics of companies can be observed through the size of a company. Large-categorized companies will receive considerable attention from the public. As such, large-categorized companies will receive more significant pressure from the public. Furthermore, large companies have greater resources and shareholders. This advantage can be used by companies to make environmental disclosures as a way to reduce the existing social pressure. It has been found that in the gas and oil industry, the size of a company positively affects environmental disclosure (Ismail et al., 2018). Some other studies have also found evidence that company size influences environmental disclosure (Ben-Amar & McIlkenny, 2015; Fontana et al., 2015; Ismail et al., 2018; Muttakin & Khan, 2014; Wahyuningrum & Budihardjo, 2018). This study proposes this following hypothesis:

H5: Large companies would present a greater extent of environmental disclosure than smaller companies.

3. Methodology

3.1. Samples and data collection

This research uses secondary data taken from annual reports and sustainability reports of all the listed companies in the Indonesia Stock Exchange (ISX) in 2014–2016. The period of data collection was chosen since 2014 was the year when the country had gained significant continuous improvement in its political stability since the start of the Reformation. In Indonesia, 1998 marked a new era called Reformation, ending the ruling of the previous regime for over three decades, which started the country's road to democracy (Indonesia Investments, n.d.). Data from the Global Economy site showed that the country's political stability index had risen from -1.73 in 1998 to -0.42 in 2014 (Global Economy, n.d.) (this was the year when the country, for the first time, reached an index score above -0.5 since the Reformation era started in 1998). Political stability is essential for business environments since it affects business practice and stakeholder confidence (Euromonitor Research, 2014). The research sample is selected through purposive sampling with the criteria described in Table 1 as follows.

Table 1. Sample selection criteria

Criteria	Number of Samples
<i>ISX registered non-financial companies in 2014–2016</i>	406
<i>Non-financial companies that do not publish reports on social responsibility</i>	346
<i>Non-financial companies that do not provide complete information</i>	24
<i>Non-financial companies used for samples per annum</i>	36
<i>Number of samples (2014–2016)</i>	108
<i>Outliers</i>	36
<i>The total number of samples used (2014–2016)</i>	72

A total of 36 analysis units are categorized as outliers after normality testing. As such, the data are eliminated in this research. The number of analysis units after outlier elimination is 72.

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3.2. Variable measurement and analysis

The dependent variable in this research is environmental disclosure (EnvDisc). The indicators are adapted from a sustainability reporting standard, namely, GRI G4 2016, which was developed by the Global Sustainability Standards Board and launched in October 2016. GRI G4 includes reporting indicators on economic, social, and environmental impacts. This research focuses on the indicators of environmental disclosure, and hence adapts only the thirty items of environmental disclosure described in the GRI G4. They consist of three items on material; five items on energy; three items on water; four items on disclosure on biodiversity; seven items on emission; five disclosure items on wastewater (effluent) and solid waste; one disclosure item on compliance; and two disclosure items on harmony. An explanation of each of the environmental disclosure items in the GRI 2016 index is presented in Table 2 as follows.

Table 2. Environmental disclosure items in GRI G4 2016

No	Indicator	Code	Explanation
301	Material	EN1	Materials used based on weight or volume
		EN2	The input material from recycling is used
		EN3	Reclaimed products and their packaging materials
302	Energy	EN4	Energy consumption in organizations
		EN5	Energy consumption outside organizations
		EN6	Energy intensity
		EN7	Reducing energy consumption
		EN8	Reduction in the energy needed for products and services
303	Water	EN9	Water withdrawal based on sources
		EN10	Water sources that are significantly affected by water withdrawal
		EN11	Water recycling and reuse
304	Biodiversity	EN12	Operational locations that are owned, leased, managed, or adjacent to protected areas and areas with high biodiversity values outside protected areas
		EN13	Significant impacts of activities, products, and services on biodiversity
		EN14	Habitat that is protected or returned
		EN15	Number of species included in national conservation data and habitat in areas affected by operations based on the risk of extinction
305	Emission	EN16	Direct GRK emissions
		EN17	Indirect GRK energy emissions
		EN18	Other indirect GRK emissions
		EN19	GRK emission intensity
		EN20	GRK emission reduction
		EN21	Ozone-depleting substances emissions
		EN22	Nitrogen oxide (NOx), sulfur oxide (SOx), and other significant air emissions
306	Wastewater (effluent) and solid waste	EN23	Release of water, based on type and method of disposal
		EN24	Waste based on disposal type and method
		EN25	Significant spill
		EN26	Transport of hazardous waste
		EN27	Water bodies that are affected by the release and overflow of water
307	Compliance	EN28	Noncompliance with environmental laws and regulations

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No	Indicator	Code	Explanation
308	Harmony	EN29	Selection of new suppliers using environmental criteria
		EN30	Negative environmental impacts in the supply chain and actions taken

Source: GRI G4 index, 2016

EnvDisc variable is measured using the adapted GRI G4 environmental index by giving a score on environmental disclosure found in each item, that is, 1 for disclosure and 0 for no disclosure. For each sample, all disclosure scores are added so that the total environmental disclosure score for each sample is obtained. The total environmental disclosure score is then divided by 30, which is the total overall environmental disclosure items in the GRI 2016 index, to obtain the mean score.

The effects of the independent variables on the dependent variable (i.e., EnvDisc) are examined through a multiple regression analysis using the SPSS 21 software. The multiple regression equation is explained as follows:

$$\text{EnvDisc} = \alpha + \beta_1 \text{EnvPer} + \beta_2 \text{EnvMS} + \beta_3 \text{Prob} + \beta_4 \text{Leve} + \beta_5 \text{Size} + \beta_6 \text{Board} + e,$$

where environmental performance (EnvPer) is measured by giving a score on the ranking color of each company in PROPER:; i.e., black = 1, red = 2, blue = 3, green = 4, and gold = 5; environmental management system measurement (EnvMS) uses a dummy variable with a score of 1 = the company has ISO 14001 and 0 = the company does not have ISO 14001; profitability (Prob) is obtained by dividing profit after tax with total assets; leverage (Leve) in this research is measured by comparing the amount of debt with total assets; and company size (Size) is measured using the natural logarithms of the total asset. This research uses good corporate governance as a control variable that is proxied by the size of the board of commissioners (Board), which is measured by the number of board members of each sample company.

4. Findings and discussion

Environmental disclosures made by each sample company on each of the GRI G4 environmental indicators are presented in Table 3.

Table 3. GRI 2016 Environmental Disclosure Item 2014–2016

No	Indicator	Code	2014	2015	2016
301	Material	EN1	3%	3%	3%
		EN2	4%	4%	4%
		EN3	0%	0%	0%
302	Energy	EN4	3%	3%	3%
		EN5	0%	0%	0%
		EN6	0%	0%	0%
		EN7	10%	14%	13%
303	Water	EN8	0%	0%	0%
		EN9	1%	1%	1%
		EN10	0%	0%	0%
304	Biodiversity	EN11	4%	4%	4%
		EN12	0%	0%	0%
		EN13	0%	0%	0%
		EN14	1%	1%	1%
305	Emission	EN15	0%	0%	0%
		EN16	1%	1%	1%
		EN17	1%	1%	1%

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No	Indicator	Code	2014	2015	2016
306	Wastewater (effluent) and solid waste	EN18	0%	0%	0%
		EN19	0%	0%	0%
		EN20	25%	31%	28%
		EN21	0%	0%	0%
		EN22	0%	0%	0%
		EN23	1%	1%	1%
		EN24	3%	3%	3%
		EN25	0%	0%	0%
		EN26	1%	1%	1%
		EN27	0%	0%	0%
307	Compliance	EN28	0%	0%	0%
308	Harmony	EN29	0%	0%	0%
		EN30	0%	0%	0%

One item in the emission indicator, i.e., "GRK emission reduction", is disclosed the most by the sample companies (25% in 2014, 31% in 2015, and 28% in 2016). It can be seen that the disclosures made by the entire sample company on this item are much higher than those made on the other items in each period.

The second most revealed item is "reducing energy consumption" within the energy indicator, i.e., 10%, 14%, and 13% respectively in 2014, 2015, and 2016. There is no disclosure found in the compliance and harmony indicators in the sample companies' annual reports, sustainability reports, and/or official websites.

Table 3 also shows that, overall, the extent of environmental disclosure made by the listed companies in the Indonesia Stock Exchange from 2014 to 2016 is low. This low extent of disclosure is purportedly due to the absence of rules that require every company in Indonesia to disclose the environmental performance that they have conducted on their company's official reports and pages.

Table 4 illustrates the comparison of environmental disclosure in each industrial sector in Indonesia in 2014–2016. These sectors include agriculture; mining; basic industry and chemicals; miscellaneous industries; consumer goods industries; trade, service, and investment; and property, real estate, and building.

Table 4. Comparison of GRI G4 environmental disclosure item between sectors

Industry	301	302	303	304	305	306	307	308	Mean
Agriculture	0.0%	0.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	1.8%
Mining	0.0%	0.0%	33.3%	25.0%	14.3%	0.0%	0.0%	0.0%	9.1%
Basic Industry and Chemicals	13.3%	10.7%	6.7%	0.0%	14.3%	0.0%	0.0%	0.0%	5.6%
Miscellaneous Industries	0.0%	6.7%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	2.6%
Consumer Goods Industries	9.7%	8.4%	6.5%	0.0%	10.1%	3.9%	0.0%	0.0%	4.8%
Property, Real Estate, and Building	0.0%	20.0%	0.0%	0.0%	14.3%	0.0%	0.0%	0.0%	4.3%
Trade, Service, and Investment	0.0%	40.0%	0.0%	0.0%	28.6%	40.0%	0.0%	0.0%	13.6%

Note: 301: Material; 302: Energy; 303: Water; 304: Biodiversity; 305: Emissions; 306: Wastewater (Effluent) and Solid Waste; 307: Compliance; 308: Harmony

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Trade, service, and investment are the industry that has the highest level of environmental disclosure based on the GRI G4. This industry makes 40% of energy disclosures, 28.6% of emissions, and 40% of wastewater (effluent) and solid waste, with an average disclosure of 13.6%. It is followed by the mining industry with an average disclosure of 9.1% by disclosing three indicators, namely, water, biodiversity, and emission with disclosure values of 33.3%, 25%, and 14.3%, respectively. Agriculture industry has the least environmental disclosure with only an emission disclosure of 14.3% and an overall average disclosure of 1.8%. This finding shows that environmental disclosures carried out by each industrial sector in Indonesia are overall still relatively low.

Table 5 presents the descriptive statistics of each variable in this study. The dependent variable in this research is environmental disclosure (EnvDisc). EnvDisc has an average value, a minimum value, and a maximum value of 0.064344, 0.0333, and 0.2000, respectively. The average value of 6.43% indicates that environmental disclosures in sample companies in Indonesia are relatively low. The independent variables in this research are PROPER (EnvPer) rank, environmental management system (EnvSM), profitability (Prob), leverage (Leve), and company size (Size).

The PROPER (EnvPer) ranking variable based on Table 5 shows that the highest-ranking obtained by the sample companies is "green" with a maximum value of 4.000. Conversely, the lowest rating obtained by sample companies is "red", as evidenced by a minimum value of 2.000, and the average sample company is ranked "blue" with a value of 3.0278. Furthermore, the sample companies have an environmental management system (EnvMS) in the form of ISO certification. As many as 50 sample units have been ISO 14001 certified, whereas 22 sample units have not been ISO 14001 certified.

According to table 5, the profitability variable (Prob) has a minimum value, a maximum value, an average value, and a standard deviation of 0.0008, 0.4394, 0.087517, and 0.0754107, respectively. The lowest and highest leverage variables are 0.0532 and 0.6688, respectively. Company size (Size) has an average value of 29.181656, with a standard deviation of 1.8376017. The standard deviation that is smaller than the average value indicates that the size of the company measured using the total logarithms of a company's asset is considered quite good because this value suggests that the sample is in the average calculation area and that company size data do not significantly differ from one another.

Table 5. Descriptive Statistics of Research Variables

	N	Min	Max	Mean	Std. Deviation
Dependent					
EnvDisc	72	0.0333	0.2000	0.064344	0.0393051
Independent					
EnvPer	72	2.0000	4.0000	3.027778	0.3742494
Prob	72	0.0008	0.4394	0.087517	0.0754107
Leve	72	0.0532	0.6688	0.375971	0.1655904
Size	72	25.1075	32.1510	29.181656	1.8376017
Control					
Board	72	3.0000	9.0000	5.138889	1.6555970
Categorical					
				N	%
EnvMS				72	100
1 = companies that have an ISO 14001				50	69
0 = companies that do not have an ISO 14001				22	31

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The results of the normality test via the Kolmogorov–Smirnov test reveal that the data are normally distributed with a significance value of 0.490. Another classic assumption test shows no signs of multicollinearity with tolerance, and the VIF values of each research variable are >0.1 and <10 (Table 6). Furthermore, no problem of autocorrelation occurs because the value of Durbin Watson shows a number of 1.986. This value is greater than dU and smaller than 4-dU $1.8019 < 1.986 < 2.1981$. With the heteroscedasticity test involving the white test, where the value of c2 count $<$ c2 table is $45.22 < 91.67$, so no symptoms of heteroscedasticity are found.

Table 6 shows the results of the hypothesis testing. First, the PROPER rating (EnvPer) measured using values of 1 to 5 in each rating color obtained by the company is proven to have a significantly positive effect on environmental disclosure. The value of the t count is 2.675, with a significance of 0.009 (sig at 0.05). This finding supports the stakeholder theory, which states that companies are responsible not only for shareholders but also for stakeholders and the environment. This positive influence shows that companies with better PROPER ratings make higher environmental disclosures than companies that obtain poorer PROPER ratings. It may indicate that companies with good PROPER ratings feel the need to do greater environmental disclosure. This disclosure is one of the ways to improve reputation in the view of stakeholders and serve as a "show off" that the companies have a deep concern for the environment. This finding is consistent with previous studies (Deswanto & Siregar, 2018; Pradini & Kiswara, 2013; Prasetya & Yulianto, 2018; Tadros & Magnan, 2019), which found a relationship between PROPER ratings and environmental disclosures.

Table 6. Results of hypothesis testing

Table 6: Results of Hypothesis Testing								
Model	Prediction	Unstd Coef		Std Coef	t	Sig.	Multicollinearity	
		B	Std. Error	Beta			Tolerance	VIF
(Constant)		−0.166	0.085		−1.964	0.054		
EnvPer	+	0.030	0.011	0.288	2.675	0.009	0.984	1.017
EnvMS	+	−0.025	0.009	−0.295	−2.649	0.010	0.917	1.090
Prob	+	−0.051	0.063	−0.099	−0.820	0.415	0.786	1.273
Leve	+	0.001	0.028	0.004	0.032	0.975	0.827	1.210
Size	+	0.006	0.002	0.280	2.513	0.014	0.914	1.094
Board	+	−0.003	0.003	−0.119	−1.065	0.291	0.907	1.103
a. Dependent Variable: EnvDisc								
R2 = 0.260								
Adjusted R2 = 0.192								
Significance at 0.05								
N = 72								

The second hypothesis states that a company with a good management system makes environmental disclosures higher than a company with a poor unproven management system. EnvMS has a significantly negative effect on environmental disclosure with a t count value of -2,649 and a significance value of 0.010. It may indicate that companies with ISO 140001 certification feel that they have good environmental performance, so they feel that making environmental disclosures is unnecessary because they have successfully obtained this certification. Conversely, companies that do not yet have an ISO 14001 certificate feel the need to make environmental disclosures as a form of positive signaling to the public that the company has carried out their environmental performance well as evidenced by conducting environmental disclosures. Some previous studies (Ismail et al., 2018; Nurhayati et al., 2015; Yusoff et al., 2013), however, found no evidence that EnvMS affects environmental disclosure.

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Third, profitability (Prob) does not have a significant effect on environmental disclosure. The results of this test do not support the stakeholder theory, which states that companies are responsive not only to shareholders but also to stakeholders and the environment. This may indicate that companies with high profitability assume that they do not need to disclose matters that may interfere with information related to their financial success, including making environmental disclosures. Such companies may consider that environmental disclosure could disrupt the focus of a community to obtain information on the success of a particular company so that it will not conduct environmental disclosures with the aim that stakeholders focus more on information on their financial success. The study of Qiu, Shaukat and Tharyan (2016) on non-financial companies in the United Kingdom in 2005–2009, also found no relationship between environmental disclosure and company profitability. This finding is also supported by the previous studies by Nor, Bahari, Adnan, Kamal and Ali (2016) and Wahyuningrum and Budihardjo (2018), and some other studies with slightly different findings (Kansal et al., 2014; Lu & Abeysekera, 2014; Muttakin & Khan, 2014).

Fourth, leverage (Leve) that is measured using debt to assets is not proven to influence environmental disclosure. The test results presented in Table 5 reveal that the value of the t count is 0.032, with a significance value of $0.975 > 0.05$. This finding does not support the stakeholder theory, which states that companies are responsive not only to shareholders but also to stakeholders and the environment. This insignificant influence may be caused by a good relationship between a company and a debtholder. This good relationship prevents a debtholder from paying too much attention to information related to environmental disclosures. A company uses this scheme as an opportunity to avoid making environmental disclosure because it focuses on maintaining good relations with debtholders. Furthermore, environmental disclosures may be considered as costs that can reduce the profits earned. Hence, they prefer to allocate profits to pay debts and maintain good relations with debtholders rather than making environmental disclosure. These results are consistent with the previous study (Deswanto & Siregar, 2018) that did not find a significant effect of leverage on environmental disclosure. Conversely, another study (Ismail et al., 2018) found a significant effect of leverage on environmental disclosure.

Fifth, the size of the company (Size) in this research has a significantly positive effect on environmental disclosure with a t count value of 2.513 and a significant level of $0.014 < 0.05$. The results of the test support the legitimacy theory, which explains that companies that make environmental disclosures carry out an activity that can be accepted by society. This observation is reinforced by the results of the test, which shows the t count value of 2.513 with a significance level of $0.014 < 0.05$.

Large companies tend to receive considerable attention from communities, so they receive a high amount of pressure. Large companies have greater resources and shareholders, so the environmental disclosure made by these companies is greater than that of small-categorized companies. These results are consistent with those of Choi, Lee and Psaros (2013), who found that the size of a company affects the disclosure of carbon emissions in companies in Australia. This finding was also supported by the previous studies (Ben-Amar & McIlkenny, 2015; Fontana et al., 2015; Ismail et al., 2018; Kansal et al., 2014; Muttakin & Khan, 2014; Wahyuningrum & Budihardjo, 2018; Yanto & Muzzammil, 2016) that found a significantly positive relationship between company size and environmental disclosure. However, these results do not support the research conducted by a previous study Gatimbu & Wabwire (2016) that did not find any influence of company size on environmental disclosure.

The control variable in this research is the board of commissioners (Board) proxied by the number of the board of commissioners in each company. The study does not find that this variable has a significant influence on environmental disclosures. The value of the t count is -1.065, with a significance of $0.907 > 0.05$. This finding does not support the stakeholder theory. This nonsignificant influence may be due to the position of the board of

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commissioners, who are representatives of shareholders, which encourage them to use profits for operational activities that are more profitable for companies than using them for social activities. The absence of this social activity may make companies with larger board of commissioners do not make environmental disclosures. These results contradict the findings of a previous study by Fernandes, Bornia, and Nakamura (2019) that examined the influence of the board of directors on environmental disclosures at the Sao Paulo Stock Exchange registered in Brazil.

5. Conclusion

Based on the disclosure index, most item disclosed by companies in their annual reports, sustainability reports, and/or official websites is "GRK emission reduction" followed by "reducing energy consumption" within the energy indicator in three years period (2014-2016). In contrast, it seems that all companies do not disclose one indicator item, namely compliance and harmony even in their annual reports. Generally, it can be concluded that the extent of environmental disclosure referred to GRI G4 is low. This low level of environmental disclosure indicates that most of the Indonesian companies have not yet kept an eye on the standard of sustainability reporting. Some of them do not provide any information about environmental in their annual reports and or sustainability reports. Since the disclosure is still voluntary, many companies still have not followed the standards and regulations.

Environmental performance is a form of company awareness in managing its resources for environmental management. This study used two measurements, namely PROPER and ISO 14001. According to PROPER rating, most companies have a "blue" rank, and the lowest rating companies have a "red" rank. In addition, more than 50% of companies have been ISO 14001 certified. This study found that PROPER rank has a significant effect on the extent of environmental disclosure; meanwhile, the environmental management system, proxied by ISO 14001, has a significantly negative effect on the extent of environmental disclosure. This results may indicate that most companies in reporting their environmental activities still do not follow the GRI guidelines even though some of them have ISO 14001 certification. The relationship between company characteristic, which is described in terms of company size, the environmental disclosure is significantly positive. The results of this study support the legitimacy theory and provide some indication that large companies feel that they have more responsibility to society and, therefore, provide a greater extent of environmental disclosure in their reports. However, the financial performance, which is described by profitability and leverage, found to have no effect on the environmental disclosures.

Overall, the findings of this study may be useful for companies, investors, and regulators in formulating policies to make decisions related to environmental disclosure. This study is also expected to provide further insights into environmental disclosure literature. This study, nevertheless, acknowledges some limitations. Firstly, many companies do not include environmental disclosures in annual reports and sustainability reports. As such, the samples obtained are rather limited. This study also uses the GRI G4 2016 index as a tool to measure environmental disclosures. Further studies could explore and use another proxy. Future studies should also consider other variables that likely influence environmental disclosures.

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References

- Archel, P.; Husillos, J.; Larrinaga, C.; Spence, C. 2009. Social disclosure, legitimacy theory and the role of the State, *Accounting, Auditing and Accountability Journal* 22(8): 1284-1307. <https://doi.org/10.1108/09513570910999319>
- Bhatia, A.; & Makkar, B. 2019. CSR disclosure in developing and developed countries: a comparative study, *Journal of Global Responsibility* 11(1): 1-26. <https://doi.org/10.1108/JGR-04-2019-0043>
- Ben-Amar, W.; & McIlkenny, P. 2015. Board effectiveness and the voluntary disclosure of climate change information, *Business Strategy and the Environment* 24(8): 704-719. <https://doi.org/10.1002/bse.1840>
- Branco, M. C., & Rodrigues, L. L. 2008. Factors influencing social responsibility disclosure by Portuguese companies, *Journal of Business Ethics*, 83(4), 685-701. <https://doi.org/10.1007/s10551-007-9658-z>
- Choi, B.B.; Lee, D.; & Psaros, J. 2013. An analysis of Australian company carbon emission disclosures. *Pacific Accounting Review* 25(1): 58-79. <https://doi.org/10.1108/01140581311318968>
- Cormier, D.; Magnan, M.; & Van Velthoven, B. 2005. Environmental disclosure quality in large German companies: economic incentives, public pressures or institutional conditions?, *European Accounting Review* 14(1): 3-39. <http://dx.doi.org/10.1080/0963818042000339617>
- Deswanto, R.B.; & Siregar, S.V. 2018. The associations between environmental disclosures with financial performance, environmental performance, and firm value, *Social Responsibility Journal* 14(1): 180-193. <https://doi.org/10.1108/SRJ-01-2017-0005>
- Devie, D.; Kamandhanu, J.; Tarigan, J.; & Hatane, S.E. 2019. Do environmental performance and disclosure bring financial outcome? Evidence from Indonesia, *World Review of Science, Technology and Sustainable Development* 5(1): 66-86. <https://dx.doi.org/10.1504/WRSTD.2019.098681>
- Djajadikerta, H.G.; & Triresnani, T. 2012. Corporate social and environmental disclosure by Indonesian listed companies on their corporate web sites, *Journal of Applied Accounting Research* 13(1): 21-36. <https://doi.org/10.1108/09675421211231899>
- Elijido-Ten, E. 2007. Applying stakeholder theory to analyze corporate environmental performance: Evidence from Australian listed companies, *Asian Review of Accounting*, 15(2), 164-184. <http://dx.doi.org/10.1108/13217340710823378>
- Elsayih, J.; Tang, Q.; & Lan, Y. 2018. Corporate governance and carbon transparency: Australian experience, *Accounting Research Journal* 31: 405-422. <https://doi.org/10.1108/ARJ-12-2015-0153>
- Euromonitor Research. 2014. *Changes in Political Stability Impact Business Environments in Emerging Markets*. <https://blog.euromonitor.com/changes-in-political-stability-impact-business-environments-in-emerging-markets/>
- Fernandes, S.M.; Borna, A.C.; Nakamura, L.R. 2019. The influence of boards of directors on environmental disclosure, *Management Decision* 57(9): 2358-2382. <https://doi.org/10.1108/MD-11-2017-1084>
- Fontana, S.; D'Amico, E.; Coluccia, D.; & Solimene, S. 2015. Does environmental performance affect companies' environmental disclosure? *Measuring Business Excellence* 19(3): 42-57. <https://doi.org/10.1108/MBE-04-2015-0019>
- Freeman, R.E. 1984. *Strategic Management: A Stakeholder Approach* Boston: Pitman.
- Gatimbu, K.K.; & Wabwire, J.M. Effect of corporate environmental disclosure on financial performance of firms listed at Nairobi Securities Exchange Kenya, *International Journal of Sustainability Management and Information Technologies* 2(1): 1-6. <https://doi.org/10.11648/j.jsmit.20160201.11>
- Giannarakis, G. 2014. The determinants influencing the extent of CSR disclosure. *International Journal of Law and Management* 56(5): 393-416. <https://doi.org/10.1108/IJLMA-05-2013-0021>
- Global Economy. n.d. *Indonesia: Political stability*. https://www.theglobaleconomy.com/Indonesia/wb_political_stability/
- Bidari, G.; & Djajadikerta, H.G. 2020. Factors influencing corporate social responsibility disclosures in Nepalese banks, *Asian Journal of Accounting Research* Ahead of print.
- Huang, C.L; & Kung, F.H. 2010. Drivers of Environmental Disclosure and Stakeholder Expectation: Evidence from Taiwan, *Journal of Business Ethics* 96 (3): 435-451. <https://doi.org/10.1007/s10551-010-0476-3>
- Indonesia Investments. n.d. *Reformation; New Challenges & Changes for Indonesia*. <https://www.indonesia-investments.com/culture/politics/reformation/item181>
- Inekwe, M.; Hashim, F.; & Yahya, S.B. 2020. CSR in developing countries – the importance of good governance and economic growth: evidence from Africa, *Social Responsibility Journal* Ahead of print. <https://doi.org/10.1108/SRJ-10-2019-0336>
- Ismail, A.H.; Rahman, A.A.; & Hezabr, A.A. 2018. Determinants of corporate environmental disclosure quality of oil and gas industry in developing countries, *International Journal of Ethics and Systems* 34(4): 527-563. <https://doi.org/10.1108/IJOES-03-2018-0042>
- Kansal, M.; Joshi, M.; & Batra, G.S. 2014. Determinants of corporate social responsibility disclosures: Evidence from India, *Advances in Accounting* 30(1): 217-229. <https://doi.org/10.1016/j.adiac.2014.03.009>
- Liao, L.; Luo, L.; & Tang, Q. 2015. Gender diversity, board independence, environmental committee and greenhouse gas disclosure, *The British Accounting Review* 47(4): 409-424. <https://doi.org/10.1016/j.bar.2014.01.002>
- Lima Crisóstomo, V.; de Souza Freire, F.; & Cortes de Vasconcellos, F. 2011. Corporate social responsibility, firm value and financial performance in Brazil, *Social Responsibility Journal* 7(2): 295-309. <http://dx.doi.org/10.1108/17471111111141549>

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- Liu, X., & Anbumozhi, V. (2009). Determinant factors of corporate environmental information disclosure: an empirical study of Chinese listed companies. *Journal of Cleaner Production* 17(6): 593-600. <http://dx.doi.org/10.1016/j.jclepro.2008.10.001>
- Lu, L.W.; & Taylor, M.E. 2018. A study of the relationships among environmental performance, environmental disclosure, and financial performance, *Asian Review of Accounting* 26(1): 107-130. <https://doi.org/10.1108/ARA-01-2016-0010>
- Lu, Y.; & Abeysekera, I. 2014. Stakeholders' power, corporate characteristics, and social and environmental disclosure: Evidence from China, *Journal of Cleaner Production* 64(1): 426-436. <https://doi.org/10.1016/j.jclepro.2013.10.005>
- Luo, L.; Tang, Q.; & Lan, Y. 2013. Comparison of propensity for carbon disclosure between developing and developed countries: A resource constraint perspective, *Accounting Research Journal* 26(1): 6-34. <https://doi.org/10.1108/ARJ-04-2012-0024>
- Muttakin, M.B.; & Khan, A. 2014. Determinants of corporate social disclosure: Empirical evidence from Bangladesh, *Advances in Accounting* 30(1): 168-175. <https://doi.org/10.1016/j.adiac.2014.03.005>
- Nor, N.M.; Bahari, N.A.S.; Adnan, N.A.; Kamal, S.M.Q.A.S.; & Ali, I.M. 2016. The effects of environmental disclosure on financial performance in Malaysia, *Procedia Economics and Finance* 35: 117-126. [https://doi.org/10.1016/S2212-5671\(16\)00016-2](https://doi.org/10.1016/S2212-5671(16)00016-2)
- Nurhayati, R.; Taylor, G.; & Tower, G. 2015. Investigating social and environmental disclosure practices by listed Indian textile firms, *The Journal of Developing Areas* 49(6): 361-372. <https://doi.org/10.1353/jda.2015.0109>
- Ong, T.; & Djajadikerta, H.G. 2018. Corporate governance and sustainability reporting in the Australian resources industry: an empirical analysis, *Social Responsibility Journal* 16(1): 1-14. <https://doi.org/10.1108/SRJ-06-2018-0135>
- Ong, T.; Trireksani, T.; & Djajadikerta, H.G. 2016. Hard and soft sustainability disclosures: Australia's resources industry, *Accounting Research Journal* 29(2): 198-217. <https://doi.org/10.1108/ARJ-03-2015-0030>
- Patten, D. M. 2002. The Relation between Environmental Performance and Environmental Disclosure: a Research Note. *Accounting, Organizations and Society*, 2(7): 763-773. [https://doi.org/10.1016/S0361-3682\(02\)00028-4](https://doi.org/10.1016/S0361-3682(02)00028-4)
- Plumlee, M. D.; Brown, R. M.; Hayes, & R. S. Marshall. 2015. Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy* 34(4): 1-26. <https://doi.org/10.1016/j.jaccpubpol.2015.04.004>
- 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, R.A.; & Yulianto, A. 2018. Analysis of factors affecting the disclosure of corporate carbon emission in Indonesia, *Jurnal Dinamika Akuntansi* 10(1): 71-81. <http://doi.org/10.15294/jda.v10i1.12653>
- Purwantini, C.; Faisal, F.; Januarti, I.; & Dwiarmoko, I.A. 2019. The relationship between environmental performance and the extent of environmental disclosure, *Humanities & Social Sciences Reviews*, 7(4): 493-501. <https://doi.org/10.18510/hssr.2019.7466>
- PROPER. 2016. Proper Report 2016: Program Rating of Company Performance in Environmental Management. Jakarta: PROPER Secretariat Office of Environment & Forestry Ministry
- Qiu, Y.; Shaukat, A.; & Tharyan, R. 2016. Environmental and social disclosures: Link with corporate financial performance, *The British Accounting Review* 48(1): 102-116. <https://doi.org/10.1016/j.bar.2014.10.007>
- Sen, M.; Mukherjee, K.; & Pattanyak, J.K. 2011. Corporate environmental disclosure practices in India, *Journal of Applied Accounting Research* 12(2): 139-156. <https://doi.org/10.1108/09675421111160709>
- Sharma, E. 2019. A review of corporate social responsibility in developed and developing nations, *Corporate Social Responsibility and Environmental Management* 26(4): 712-720. <https://doi.org/10.1002/csr.1739>
- Suastha, R.D. 2016. July 2016. Riset Temukan Kualitas CSR Perusahaan Indonesia Rendah. Retrieved from <https://www.cnnindonesia.com/nasional/20160721074144-20-146030/riset-temukan-kualitas-csr-perusahaan-indonesia-rendah>
- Sulaiman, M.; Abdullah, N.; & Fatima, A.H. 2014. Determinants of environmental reporting quality in Malaysia, *International Journal of Economics, Management and Accounting* 22: 63-90.
- Tadros, H.; & Magnan, M. 2019. How does environmental performance map into environmental disclosure? *Sustainability Accounting, Management and Policy Journal* 10(1): 62-96. <https://doi.org/10.1108/sampj-05-2018-0125>
- Trireksani, T.; & Djajadikerta, H. 2016. Corporate governance and environmental disclosure in the Indonesian mining industry, *Australasian Accounting Business and Finance Journal* 10(1): 18-28. <https://doi.org/10.14453/aabfj.v10i1.3>
- Wahyuningrum, I.F.S.; & Budihardjo, M.A. 2018. Relationship between company financial performance, characteristic and environmental disclosure of ASX listed companies. *E3S Web Conf.* Vol. 73. <https://doi.org/10.1051/e3sconf/20187310024>
- Yanto, H.; & Muzzammil, B.S. 2016. A long way to implement environmental reporting in Indonesian mining companies, *International Journal of Applied Business and Economic Research* 14: 6493-6513. <http://dx.doi.org/10.2139/ssrn.2908974>
- Yusoff, H.; Othman, R.; & Yatim, N. 2013. Environmental reporting practices in Malaysia and Australia, *Journal of Applied Business Research* 29(6): 1717-1726. <https://doi.org/10.19030/jabr.v29i6.8209>
- Zhang, J.; Djajadikerta, H.G.; & Trireksani, T. 2019. Corporate sustainability disclosure's importance in China: Financial analysts' perception, *Social Responsibility Journal* Ahead of print. <https://doi.org/10.1108/SRJ-10-2018-0272>
- Zhang, J.; Djajadikerta, H.G.; & Zhang, Z. 2018. Does sustainability engagement affect stock return volatility? Evidence from the Chinese financial market, *Sustainability*, 10: 3361. <https://doi.org/10.3390/su10103361>

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