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## The Role of Firm Size on Moderating the Relationship Between Type of Industry and Audit Committee on Environmental Performance

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**Abstract:** This study aims to examine the effect of type of industry and audit committee on environmental performance. Furthermore, this research investigates the role of firm size as moderating variable on the relationship between industry type and audit committee on environmental performance. The sample consisted of 66 firms listed on the Indonesia Stock Exchange (IDX) and achieving PROPER awards. The analytical method used descriptive analysis and an ordinal regression analysis with an absolute difference value test for moderation. The type of industry and the audit committee's activities positively affect environmental performance. In addition, firm size could moderate the relationship of type of industry on environmental performance. However, firm size did not give any influence on the relationship between audit committee and environmental performance. Finally, this paper indicated that environmental performance positively affected firm size in term of relationship between type of industry. This research limitation is only covered PROPER firms. Thus, the finding cannot be generalized for other sectors. This research is the first model to investigate the role of firm size for on the relationship between type of industry, audit committee and environmental performance. This paper gives more knowledge for government to make policy related environmental problem in Asia especially Indonesia. Moreover, the study contribute to the company's management practices. Firm should encourage their size to achieve better environmental performance. Then for government should make the strict policy related for environmental sustainability to avoid severe natural damage.

**Keywords:** Audit Committee, Environmental Performance, Firm Size, Type of Industry

**Authors' individual contribution:** Conceptualization — R.H.; Methodology — D.S.; Software — R.D.; Validation — F. R; Formal Analysis — T.S.; Investigation — R.H.; Resources — S.; Data Curation — F.T.; Writing — Original Draft — R.H.; Writing — Review & Editing — D.S.; Visualization — T.S.; Supervision — S.; Project Administration — F. T. and R.D

**Declaration of conflicting interests:** The Authors declare that there is no conflict of interest.

**JEL Classification:** G3, G32, M41, M14

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# 1. INTRODUCTION

The increasing need for life requires humans to continue to carry out consumption activities. As a party that fulfills the markets, the firm takes this opportunity to obtain maximum profit. However, to achieve this, firms sometimes ignore the environmental impacts arising from their operations. The environmental effects can be in the form of environmental pollution or environmental destruction. These impacts can threaten the sustainability of living things because the environment is a place to run life.

Forest and land fires certainly have negative impacts, including damage to the habitats/places of living creatures that have the potential to threaten their survival so that in the long term, it is feared that it can reduce biodiversity, disrupt biological balance and plant metabolic systems, smoke disturbances that cause air pollution and pollution. Limited visibility, erosion, flooding, landslides, and increased levels of greenhouse gases and carbon dioxide.

The increasing pollution caused by the company shows the poor management of the company. This triggers low environmental performance and has a bad impact on the company (Firmansyah et al., 2021). The company's environmental performance is also related to the company's industry type. High profile companies have better environmental performance than low profile companies. Previous research revealed that the type of industry has a significant positive effect on environmental performance (Yesika & Chariri, 2013). Contrary to the results of research (Tiurmali et al., 2018) and (C. W. Sari & Ulupui, 2013), which state that the type of industry does not affect environmental performance.

Going more depth, the development of industrial activities in the plantation sector has changed its function into an industrial area. Land damage is caused by illegal logging, which clears land by burning. The law has ensnared several firms due to forest and land fires in recent years. PT Sumber Sawit Sejahtera in Indonesia was found guilty of land fires in February 2019, which caused state losses of Rp 55 billion. A similar case happened to PT National Sago Prima, which was sued for a 3,000-hectare land fire in 2015 in Riau. The lawsuits against both were won by the Ministry of Environment and Forestry of the Republic of Indonesia. PT Sumber Sawit Sejahtera was found guilty of fire on 400 hectares of its concession area

and was required to pay compensation of Rp 160 billion, while PT National Sago Prima was found guilty, and the total dividend to be paid was 319 billion-plus recovery costs of 753 billion. The cases above are a small part of the confirmed cases that occurred in Indonesia. The area of forest and land fires in all regions in Indonesia from 2017-2019 is 2,344,008.56 hectare (SiPongi Karhutla Monitoring System, 2020). Environmental problems due to the firm's operations are also found in water areas, such as river pollution by PT Pindo Deli III in Karawang, which is proven to pollute the environment by dumping liquid waste into the Cikereteg river. As a result, the Karawang Regency Environment and Hygiene Service officially stopped the firm's operational activities through Decree No. 660.1/927/PPL dated April 29, 2019.

The cases above show that the firm's responsibility in overcoming the impact of its operations on the environment is still lacking, or its environmental performance is still low. Therefore, the audit committee as a control structure is considered to have also contributed to this condition. audit committee plays a role in achieving the company's environmental performance. Activity of audit committee have a positive effect on environmental performance (Yuyetta et al., 2017). Hence, the role of audit committee is very important. The activities of the audit committee have a positive effect on environmental performance (Wijayanti, 2016). However, this contradicts the results of research which show that audit committee activities do not affect environmental performance (Yesika & Chariri, 2013). Moreover, one of the factors that cannot give an impact on improving the company's environmental performance is the audit committee (Tania & Herawaty, 2019), (Nasir et al., 2019), (Yusnita, 2010), and (Kusumawati, 2017). Moreover, some researches argue that sensitive industry has a significant effect on environmental performance (Garcia et al., 2017) Next, better environmental performance is owned by companies with high environmental sensitivity or high-profile companies (Crisóstomo et al., 2019). Moreover, type of industry has a positive and significant effect on environmental performance (Yuyetta et al., 2017). Type of industry also give impact on environmental investment (Nasir et al., 2019), (Z. Chen & Hamilton, 2020), (Paramita, 2015).

Therefore, this research will elaborate on firm size, type if industry and audit committee to evaluate the environmental performance on

PROPER companies which is this research model has never used before. The structure of research is as follows, section 1 explore the introduction of the phenomena gap and research gap. Section 2, presents the literature review and how hypothesis developed. Next, section 3 analyses the methodology including sample, variable measurement and data analysis. Section 4 discusses the results of data analysis. Finally, section 5 which present the conclusion of this paper.

## **2. LITERATURE REVIEW**

### **2.1 The Social Contract Theory**

Social contract theory reveals social relations in society to create harmony, harmony, and balance, including the environment.(Prayogo, 2011) revealed that the social contract implicitly implies a mutual agreement where on the one hand, legitimacy is given by the community for the existence of a firm, and on the other hand, economic benefits must be provided by a firm to the community. Therefore, the firm and society are reciprocal or influence each other. A social contract is needed to protect each party's interests for a balance to occur between the two. Good environmental performance can indicate that the firm has carried out its responsibility to fulfill its social contract with the community. Then the community will give trust and legitimacy to the firm so that a balance can be achieved.

### **2.2 The Stakeholder Theory**

The stakeholder theory believes the firm as an entity that must fulfill the interests of all its stakeholders, not only to fulfill its interests (Dewi & Wirasedana, 2017). Firm stakeholders include employees, managers, suppliers, creditors, the government, and the entire community around the firm, including the community (Hidayah et al., 2020). One form of fulfilling the community's interests, the firm care and protects the environment. The environment is where the community lives, so it has an important role. People have hope for a sense of security and comfort so that the environment must be preserved. Therefore, the firm's operational activities should not pollute or damage the environment but instead have a good impact.

### **2.3 Hypothesis Development**

The size of the firm can influence the environmental performance. Firm size company determines the extent of the company's environmental scanning (Jehad S. Aldehayyat, 2015). Moreover, the large companies have a greater responsibility for environmental sustainability. Hence, this study use firm size for moderating variable. The larger the size of the company, the greater the resources to finance environmental performance improvements. Big companies also tend to get more public attention so they will put in more effort to maintain their good image. This will motivate the company to have a good environmental performance. Large company sizes tend to have more complex operating activities that will have an impact on the environment. Therefore, the wider scope of audit committee review is able to improve environmental performance. The more problems are found, the audit committee holds more frequent meetings to follow up on these problems so that they are immediately resolved and prevent the impact from spreading further. Therefore, firm size is thought to moderate the effect of industry type and audit committee activity on environmental performance.

The type of industry shows the level of sensitivity of the operational process in company that gives impact on society and the environment. The type of company industry is divided into 2, namely high-profile industry and low-profile industry (R. A. Sari, 2012). High-profile companies are more easily highlighted by the public if they make mistakes and fail in their operations. In contrast to small companies, which receive less attention because the community considers that the environmental impact caused is not too significant. This is because the public is aware that the activities of high-profile companies have a higher risk of having a negative impact on the environment. More attention from the public encourages the company to maintain and continue to strive to create a good image. Public attention will also encourage companies to have better environmental performance (Cheng & Liu, 2018). Social responsibility shows the company's awareness that it wants to provide benefits to the community in return for the recognition it gives to the company. This reciprocal relationship is in accordance with the social contract theory which states that the social contract implicitly implies a mutual agreement where on the one hand, legitimacy is given by the community for the existence of a company, and on the other hand



economic benefits must be provided by a company to the community (Prayogo, 2011). In addition, compared to low profile companies, high profile companies have operating activities that are more closely related to nature/environment. Therefore, high profile companies feel they have a higher responsibility to contribute to environmental management because their industrial activities have a greater risk of causing environmental pollution, so high-profile companies are encouraged to improve their environmental performance. Especially if the company is a large company which of course has more complex operating activities. Large companies strive to achieve high production targets to meet market needs. The company's operating activities generate residues in the form of waste. The production of polluting companies is considered a serious problem affecting the environment (S. Chen et al., 2021). The higher the operating activity, the more waste will be generated. Large companies pay high attention to the social and environmental impacts of their operating activities because these have an important impact on their image (Tania & Herawaty, 2019). Larger companies are able to provide more resources to support the company's social and environmental policies (Crisóstomo et al., 2019). The capability shown by the available resources supports the company to implement CSR programs so as to improve its environmental performance.

The activities of the audit committee relate to its duties and responsibilities as a committee formed by the board of commissioners who assists it in carrying out its functions. According to Article 10 of the Regulation of the Financial Services Authority of the Republic of Indonesia Number 55/POJK.04/2015 of 2015 concerning the Establishment and Guidelines for the Work Implementation of the Audit Committee, the duties and responsibilities of the audit committee include reviewing financial information that will be issued by the company to the public or other parties in the form of financial reports, projection reports, and other reports related to the company's

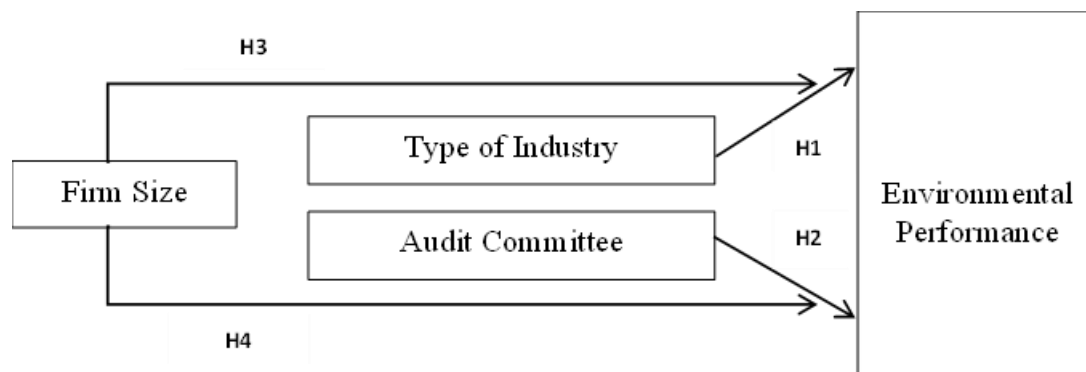
financial information; conduct a review of compliance with laws and regulations and so on. The audit committee works independently without taking sides with any party. There is no interest that is more priority than the objectives of the company. This principle helps the company to position itself as an entity that must provide benefits to all its stakeholders, as explained by stakeholder theory. Company stakeholders include employees, managers, suppliers, creditors, government, and the community around the company including the community (Hidayah et al., 2020). Therefore, the audit committee helps fulfill the balanced interests of the company and the community. The company wants legitimacy and trust from the community, while the community wants contributions or social benefits from the company. The balanced reciprocal relationship between the two is in accordance with the social contract theory. The audit committee have to review the compliance of the company's activities with environmental regulations, and to review risk management activities. When the audit committee finds violations of the law and it will give a negative impact on society and the environment, so the audit committee can discuss the solution at the audit committee meeting. The meeting will produce a decision as a solution to the problems that occur. The parties present at the meeting can also discuss new breakthroughs to prevent the problem from recurring or preventive measures to prevent other problems that may occur. Chariri et al. (2017) believe meetings are used to discuss and decide policies related to environmental issues. Based on the literature review and previous research above, we develop the following hypothesis:

*H1: The type of industry has a positive effect on environmental performance*

*H2: Audit committee has a positive effect on environmental performance*

*H3: Firm size moderates the relationship between type of industry and environmental performance*

*H4: Firm size moderates the the relationship between audit committee and environmental performance*



### 3. RESEARCH METHODOLOGY

The was collected for firms listed on the Indonesia Stock Exchange and participated in PROPER

during 2017 to 2019. The sample technique is a *purposive sampling*, which means that the sample was selected based on specific criteria as follows:

**Table 1.** Sample Selection Criteria

No	Criteria	Amount
1	The firm is listed on the Indonesia Stock Exchange and participates in PROPER 2017-2019	75
2	The firm does not issue financial statements for 2017-2019	(5)
3	The firm's financial statements do not have the complete data needed in the research	(4)
Research sample firms		66
Number of units of analysis (number of research sample firms x 3 years)		198

**Table 2.** Variable Operational Definition

Variable	Definition	Measurement
Environmental Performance	Environmental performance is the firm's performance in creating a suitable environment (Suratno et al., 2007).	Firms rank in PROPER: 5 (gold), 4 (green), 3 (blue), 2 (red), 1 (black) (Yuyetta et al., 2017).
Industry type	The type of industry is related to the level of sensitivity of the firm to produce a negative impact on its activities on the environment (Yuyetta et al., 2017).	Industry type = 0 ( <i>low profile</i> firm) 1 ( <i>high profile</i> firm) (R. A. Sari, 2012).
Audit Committee	Activities in the form of meetings and audit meetings can discuss and converse about policies related to environmental issues (Yuyetta et al., 2017).	Audit committee activity t = number of meetings in one year (Yuyetta et al., 2017) (Yuyetta et al., 2017).
Firm size	Classification of the size of a firm (Tanti Kustina & Tzania, 2020).	Firm size = Ln Total Assets (Harsono et al., 2012).

Data analysis used, ordinal regression, and *moderating regression analysis* (MRA). The research model formed is:

$$KNL = \alpha + \beta_1 ZTPI + \beta_2 ZAKA + \beta_3 ZUKP + \beta_4 |ZTPI-ZUKP| + \beta_5 |ZAKA-ZUKP| + e \quad [1]$$

Where:

KNL : Environmental Performance

$\alpha$  : Regression constant

$\beta_i$  : Regression coefficient, where  $i = 1, 2, 3, \dots$  (independent variable)

ZTPI : Zscore of Industrial Type

ZAKA : Zscore from Activities as Audit Committee

ZUKP : Zscore of Firm Size

$|ZTPI-ZUKP|$  : Absolute value of zscore TPI – zscore SIZE

$|ZAKA-ZUKP|$  : Absolute value of zscore AKA – zscore SIZE

e : Error

## 4. RESULTS

Descriptive statistical analysis shows a description of the profile of each variable. For environmental performance, most of them have a relatively good environmental performance, as indicated by a blue rating of 74.7% and a green rating of 13.6% of the total.

**Table 3.** Descriptive Statistics of Environmental Performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2,00	18	9,1	9,1	9,1
	3,00	148	74,7	74,7	83,8
	4,00	27	13,6	13,6	97,5
	5,00	5	2,5	2,5	100,0
	Total	198	100,0	100,0	

Based on Table 4 Descriptive Statistics of type of industry shows most of the firms are *high-profile* firms with high sensitivity to

the environment. Hence, the larger firms then the higher their responsibility to environment.

**Table 4.** Descriptive Statistics of Type of Industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	27	13,6	13,6	13,6
	1,00	171	86,4	86,4	100,0
	Total	198	100,0	100,0	

Table 5 shows the maximum meeting for audit committee is 45 times. Then, the minimum of meeting is one time which is happened in PT Trisula Textile Industries Tbk in 2017. In 2018

and 2019, the maximum meeting is owned by PT Semen Indonesia (Persero) Tbk. In conclusion, the average meeting for audit committee meetings four times a year.

**Table 5.** Descriptive Statistics of Audit Committee Activity

	N	Minimum	Maximum	Mean	Std. Deviation
AKA	198	1,00	45,00	8,5051	8,89233
Valid N (listwise)	198				

Table 6 shows the minimum value of firm size was owned by PT Mustika Ratu Tbk in 2017, while the maximum value was owned by PT

Indah Kiat Pulp & Paper Tbk in 2018. The standard deviation is smaller than the average value, meaning that the data has an even distribution.

**Table 6.** Descriptive Statistics of Firm Size

	N	Minimum	Maximum	Mean	Std. Deviation
UKP	198	13,12	18,66	15,7650	1,49333
Valid N (listwise)	198				

Table 7 show the *final* value of overall model fit test results is less than the *intercept-only* value, or there is a decrease in the value of *-2 Log Likelihood*. A significance value less than 0.05 indicates that the model is considered fit. It is mean that the model becomes better with the

addition of independent variables into the regression model and this research model is fit. In addition, Table 8 show the significance value of Pearson and Deviance is more than 0.1 so the model is fit, Hence, the regression model is feasible to be used in further analysis.

**Table 7.** Overall model fit test results

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	316,856			
Final	266,825	50,031	5	,000

**Table 8.** The results of the regression model feasibility test (goodness of fit test)

	Chi-Square	df	Sig.
Pearson	438,129	586	1,000
Deviance	266,825	586	1,000

Based on the regression shows the H1 is accepted because the significance value is 0.017 which is lower than 0.05. Then H2 is accepted because the significance value is 0.002 which is lower than 0.05. Therefore, audit committee has a positive effect on environmental performance. In addition,

the value of significance H3 is 0.025 which is lower than 0.05 so H3 accepted. Hence, firm size can moderate the relationship between type of industry and environmental performance. However, H4 is rejected because the significance level is more than 0.05.

**Table 9.** Hypothesis Test Results

Hypothesis	Coef.	Sig.
H1: The type of industry has a positive effect on environmental performance	0,275	0,017
H2: Audit committee has a positive effect on environmental performance	0,366	0,002
H3: Firm size moderates the effect of industry type on environmental performance	0,391	0,025
H4: Firm size moderates the effect of audit committee activities on environmental performance	0,084	0,636

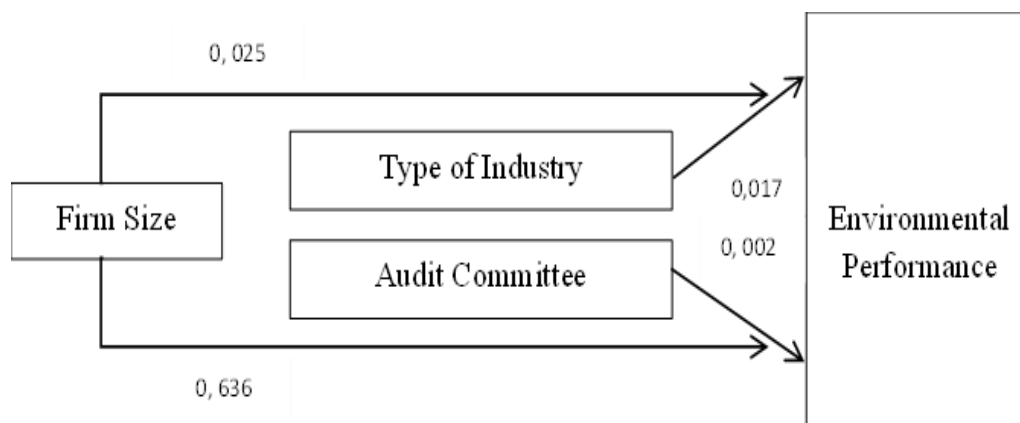


Fig 1. Result

## 5. DISSCUSSION

The result of regression shows the type of industry proved to have a positive effect on environmental performance. This result is in line with the stakeholder theory, where in addition to fulfilling its interests, the firm must fulfill the interests of the community, in this case, the interests of feeling safe and comfortable living in a sustainable environment. The type of industry shows the level of sensitivity of the firm in producing negative impacts on the environment. This sensitivity classifies firms into two types, namely high profile and low profile. High-profile firms are more sensitive, so they are easier to spot. Therefore, high-profile firms constantly strive to create and maintain a good image through good environmental performance. Public attention will encourage firms to have better environmental performance (Cheng & Liu, 2018). The environmental aspect has a significant effect on the firm's image to build a positive firm image, and this environmental aspect is crucial to pay attention to (Juri & Sailawati, 2020). The industry is an essential factor in influencing environmental performance based on how sensitive the firm responds to environmental issues (Nasir et al., 2019). High-profile firms feel they have a higher responsibility to contribute to environmental management because the impact on the environment tends to be greater than low-profile firms. High-profile firms have higher environmental performance than low-profile firms (Rachman, 2013). Firms with high sensitivity to the environment have environmental performance following applicable laws and

regulations (Yesika & Chariri, 2013). The more sensitive the firm, the better its environmental performance. The results of this study are in line with the results of research (Yuyetta et al., 2017), (Nasir et al., 2019), (Garcia et al., 2017), (Crisóstomo et al., 2019), (Yesika & Chariri, 2013), and (Paramita, 2015) who argue that type of industry gives positively impacts on environmental performance.

Subsequent evidence, the audit committee's activities proved to affect environmental performance in a positive direction. The audit committee's activities are related to implementing their duties and responsibilities that uphold independence so that each action does not favor one group, in line with stakeholder theory and social contract theory. The duties and responsibilities of the audit committee that are closely related to the environment are to review the compliance of the firm's activities with the laws and regulations and review risk management activities if there is no risk monitoring function under the board of commissioners. The audit committee is responsible for monitoring risk management policies, including the risk of firm activities that can cause negative impacts on the environment (Yuyetta et al., 2017). The audit committee has an essential role in overseeing firm policies related to environmental issues (Trotman & Trotman, 2015). The results of the study found were discussed through the audit committee meeting to discuss the next steps. From the meeting, a decision was made as a solution to overcome the problems found. The readiness of the audit committee in dealing with problems also affects environmental performance. When the audit committee finds risk management activities

that are not working correctly, the audit committee can communicate the findings to the parties involved. The results of these communications are discussed through audit committee meetings as material for evaluation and finding solutions. This will maximize risk management activities to minimize the negative impact of the firm's operations on the environment. The higher the frequency of audit committee meetings, the better the firm's environmental performance. These results are in line with the results of research (Yuyetta et al., 2017) and (Wijayanti, 2016).

Firm size is proven to moderate the influence of industry type on environmental performance seen from the significance value obtained of 0.025 less than 5%. Following stakeholder theory and social contract theory, the firm fulfills the interests of all stakeholders, including society and the environment. High-profile firms with high sensitivity tend to minimize the environmental impact, especially if they are large firms with sufficient resources to finance it. Resources are essential and needed to realize programs that aim to improve the firm's environmental performance. As stated (Crisóstomo et al., 2019), larger firms can provide more resources to support corporate social and environmental policies. Large firms tend to finance efforts to improve environmental performance and have better environmental investment policies (Tiurmali et al., 2018). In addition, large firms have more complex operating activities. Large firms strive to achieve production targets to meet market needs. The production of polluting firms is considered a severe problem affecting the environment (S. Chen et al., 2021). The higher the operating activity, the more waste/pollution will be generated. People will be increasingly worried about the increasing intensity of waste and the risk of harming the environment if it is not appropriately managed. Firms are encouraged to make more efforts in overcoming this problem. Large firms pay great attention to social and environmental impacts due to their operating activities because these have an important impact on their image (Tania & Herawaty, 2019). High public demands for environmental protection encourage companies to innovate and improve their performance to ensure their legitimacy (Cheng & Liu, 2018). The implementation of good environmental management has a big impact on improving the company's good image (C. W. Sari & Ulupui, 2013). Moreover, good environmental performance can avoid

management scandals (Alhares et al., 2021). Companies with large total assets have more funds to invest in technology and sound environmental management. This encourages companies to have good environmental performance and motivates them to disclose information in order to maintain the company's reputation (Yusnita, 2010). High sensitivity supported by adequate resources and motivation to maintain a good image encourages firms to improve their environmental performance.

On the other hand, firm size proved unable to moderate the effect of audit committee activities on environmental performance seen from the significance value obtained at 0.636 more than 5%. This result is contrary to stakeholder theory and social contract theory, where the more significant the firm, the more it will try to continuously improve its performance. Moreover, the firm want to gain legitimacy and a good image then meet the growing demands of society. This study failed to prove the influence of firm size, which was considered capable of moderating the effect of audit committee activities on environmental performance. Firm size did not affect the frequency of audit committee meetings held by a firm. This condition due to the awareness of audit committee, whether big firm or small they have a strict job description that must be done. The data of this study support this estimate. Large firms such as PT Indah Kiat Pulp & Paper Tbk and PT United Tractors Tbk hold audit committee meetings four times a year and receive a blue rating in PROPER. Meanwhile, small firms such as PT Trisula Textile Industries Tbk, PT Prasadha Aneka Niaga Tbk, and PT Tirta Mahakam Resource Tbk also hold audit committee meetings four times a year and get the same rating, namely blue rating in PROPER. Large firms that are considered to have a broader scope do not guarantee a high frequency of audit committee meetings. On the other hand, small firms do not necessarily have a low frequency of audit committee meetings cause the minimum number of meetings already regulated by the government policy.

## 6. CONCLUSION

The type of industry and the audit committee have a significant positive effect on environmental performance. Then, firm size can moderate the effect of industry type on environmental

performance. However, firm size cannot moderate the effect of audit committee activities on environmental performance. Therefore, firms that have large sizes must improve environmental performance to maintain the firm's sustainability. This paper contribute to the company's management practices. Then, for government should make the strict policy related for environmental sustainability to avoid severe natural damage. This research limitation is only covered PROPER firms. Further research should use companies from many sectors. and use firm size as an intervening variable to determine the extent of the role of firm size on environmental performance comprehensively.

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Best regards,  
Olha



**Olha Lytvynenko**  
Senior Managing Editor, Managing Editor of the journals "Corporate Ownership and Control", "Corporate Board: Role, Duties and Composition", "Journal of Governance and Regulation" and "Risk Governance and Control: Financial Markets & Institutions"

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thank you very much **for your submission**  
We will arrange your paper for the double-blind peer review and will get back to you with the results and further information in about 5-6 weeks.  
If you have any questions, don't hesitate to contact me.

Best regards,  
Olha  
[Kutipan teks disembunyikan]  
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**Olha Lytvynenko**  
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**3. Hasil Review Tahap I:  
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Editorial Note dan Reviewer's Report  
(10 Juni 2022)**



Olha Lytvynenko <olha.lytvynenko@virtusinterpress.org>

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Jum, 10 Jun 2022, 17:52



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Dear Retnoningrum Hidayah,

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Please be so kind as to address the comments provided by the reviewer and the editorial team and to send your revised manuscript by **June 24**.

Please mark the introduced changes in the manuscript (with some colour, if possible).

If you have any questions, please let me know.

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Dear Retnoningrum Hidayah,

please find **the reviewer's report and the editorial note attached below**. The paper "*The Role of Firm Size on Moderating the Relationship Between Type of Industry and Audit Committee on Environmental Performance*" requires certain adjustments before it can be accepted.

Please be so kind as to address the comments provided by the reviewer and the editorial team and to send your revised manuscript by **June 24**.

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<b>Date of the Review completion:</b>	10 June 2022		
<b>Please choose options that can characterize the paper:</b>			
<b>Originality and importance of the paper to the field of research:</b>	Medium		
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<b>Please tick relevant for the abstract</b>	The abstract provides an accurate summary of the manuscript (including aim, methods, key results and relevance of the study)	<input checked="" type="checkbox"/> yes	<input type="checkbox"/> no
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INTRODUCTION – the aim and research problem must be clearly formulated.			
2.1 The Social Contract Theory – the theory needs to be better grounded in the literature.			
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**4. Penulis menyatakan akan segera melakukan revisi  
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**Retnoningrum Hidayah** <retnoningrum.hidayah@mail.unnes.ac.id>

Sel, 14 Jun 2022, 17.43

kepada Olha ▾

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Thank you very much. We will make revision as soon as possible

Best regards,



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14 Jun  
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17.43

kepada Olha

Well received.

Thank you very much. We will make revision as soon as possible

Best regards,

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yang diresubmit  
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Sen, 20 Jun 2022, 14:50 ☆

Dear The Committee

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Here we attach the results of our revision.  
The things that we revised have been marked with the writing color in GREEN ink

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Best regards,  
Retnoningrum Hidayah, S.E., M.Si.,MSc.,QIA., CRMP  
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Faculty of Economics,  
Universitas Negeri Semarang

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We are looking forward to hearing good news from you

Best Regards  
Retnoningrum Hidayah, S.E., M.Si.,MSc.,QIA., CRMP  
Lecturer of Accounting Department  
Faculty of Economics,  
Universitas Negeri Semarang



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## The Role of Firm Size on Environmental Performance in Indonesia

Retnoningrum Hidayah \*\*, Dhini Suryandari\*, Trisni Suryarini\*, Sukirman\*, Ima Nur Kayati\*, Rahayu Dinassari\*, Fian Tri Rohmah\*

\*Accounting Department, Universitas Negeri Semarang, Semarang, Indonesia

\*\**Corresponding author*, retnoningrum.hidayah@mail.unnes.ac.id;

<https://orcid.org/0000-0003-3714-8861>

Contact details: Accounting Department, Universitas Negeri Semarang, Kampus Sekaran Gunung Pati, Semarang 50229, Indonesia

**Abstract:** The balance of economic development and environmental performance is very important for human life (Zhang et al., 2022.; Haldorai et al., 2022). This study aims to examine the role of firm size on the relationship between type of industry and audit committee on environmental performance. The sample consisted of 198 units of analysis. The method used descriptive analysis and an ordinal regression analysis with an absolute difference value test for moderation. The results show the type of industry and the audit committee positively affect environmental performance. In addition, firm size could moderate the relationship between type of industry and environmental performance. However, firm size failed to moderate the relationship between audit committee and environmental performance. This research limitation is only covered PROPER firms. This research is the first model to investigate the role of firm size for on the relationship between type of industry, audit committee and environmental performance. This paper gives more knowledge for government to make strict policy related environmental problem to avoid severe natural damage in Southeast Asia especially Indonesia. This study contributes to the literature of company's management practices. Firm should encourage the audit committee effectiveness and improve the asset to achieve better environmental performance.

**Keywords:** Audit Committee, Environmental Performance, Firm Size, Type of Industry

**Authors' individual contribution:** Conceptualization — R.H.; Methodology — D.S.; Software — R.D.; Validation — F.T.R and I.N.K; Formal Analysis — T.S.; Investigation — R.H.; Resources — S.; Data Curation — F.T.R; Writing — Original Draft — R.H.; Writing — Review & Editing — D.S.; Visualization — T.S.; Supervision — S.; Project Administration — I.N.K, F. T. R and R.D

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**JEL Classification:** G3, G32, M41, M14

## 2. INTRODUCTION

The increasing need for life requires humans to continue to carry out consumption activities. As a party that fulfils the markets, the firm takes this opportunity to obtain maximum profit. However, to achieve this, firms sometimes ignore the environmental impacts arising from their operations. The environmental effects can be in the form of environmental pollution or environmental destruction. These impacts can threaten the sustainability of living things because the environment is a place to run life.

Forest and land fires certainly have negative impacts, including damage to the habitats/places of living creatures that have the potential to threaten their survival so that in the long term, it is feared that it can reduce biodiversity, disrupt biological balance and plant metabolic systems, smoke disturbances that cause air pollution and pollution. Limited visibility, erosion, flooding, landslides, and increased levels of greenhouse gases and carbon dioxide. **The improvement of economic and environmental performance is very important for human life** (Zhang et al., 2022.; Haldorai et al., 2022)

The increasing pollution caused by the company shows the poor management of the company. This triggers low environmental performance and has a bad impact on the company (Firmansyah et al., 2021). The company's environmental performance is also related to the company's industry type. High profile companies have better environmental performance than low profile companies. Previous research revealed that the type of industry has a significant positive effect on environmental performance (Yesika & Chariri, 2013). Contrary to the results of research which state the type of industry does not affect environmental performance (Tiurmali et al., 2018; Sari & Ulupui, 2013).

Going more depth, the development of industrial activities in the plantation sector has changed its function into an industrial area. Land damage is caused by illegal logging, which clears land by burning. The law has ensnared several firms due to forest and land fires in recent years. PT Sumber Sawit Sejahtera in Indonesia was found guilty of land fires in February 2019, which caused state losses of Rp 55 billion. A similar case happened to PT National Sago Prima, which was sued for a 3,000-hectare land fire in 2015 in Riau. The

lawsuits against both were won by the Ministry of Environment and Forestry of the Republic of Indonesia. PT Sumber Sawit Sejahtera was found guilty of fire on 400 hectares of its concession area and was required to pay compensation of Rp 160 billion, while PT National Sago Prima was found guilty, and the total dividend to be paid was 319 billion-plus recovery costs of 753 billion. The cases above are a small part of the confirmed cases that occurred in Indonesia. The area of forest and land fires in all regions in Indonesia from 2017-2019 is 2,344,008.56 hectare (Sipongi, 2020). Environmental problems due to the firm's operations are also found in water areas, such as river pollution by PT Pindo Deli III in Karawang, which is proven to pollute the environment by dumping liquid waste into the Cikereteg river. As a result, the Karawang Regency Environment and Hygiene Service officially stopped the firm's operational activities through Decree No. 660.1/927/PPL dated April 29, 2019.

The cases above show that the firm's responsibility in overcoming the impact of its operations on the environment is still lacking, or its environmental performance is still low. Therefore, the audit committee as a control structure is considered to have also contributed to this condition. audit committee plays a role in achieving the company's environmental performance. Activity of audit committee have a positive effect on environmental performance (Yuyetta et al., 2017). Hence, the role of audit committee is very important. The activities of the audit committee have a positive effect on environmental performance (Wijayanti, 2016). However, this contradicts the results of research which show that audit committee activities do not affect environmental performance (Yesika & Chariri, 2013). Moreover, one of the factors that cannot give an impact on improving the company's environmental performance is the audit committee (Tania & Herawaty, 2019; Nasir et al., 2019; Yusnita, 2010; Kusumawati, 2017). Moreover, some researches argue that sensitive industry has a significant effect on environmental performance (Garcia et al., 2017) Next, better environmental performance is owned by companies with high environmental sensitivity or high-profile companies (Crisóstomo et al., 2019). Moreover, type of industry has a positive and significant effect on environmental performance (Yuyetta et al., 2017). Type of industry also give impact on

environmental investment (Nasir et al., 2019; Chen & Hamilton, 2020; Paramita, 2015). Environmental performance is very important for social life. Hence, this research elaborates on firm size, type of industry and audit committee to evaluate the environmental performance on PROPER companies. This research has never used before. Moving from the consideration above, we address four research questions

*RQ1: Does the type of industry have a positive effect on environmental performance?*

*RQ2: Does the audit committee have a positive effect on environmental performance?*

*RQ3: How is company size able to moderate the relationship between industry type and environmental performance?*

*RQ4: How is firm size able to moderate the relationship between the audit committee and environmental performance?*

The structure of research is as follows, section 1 explores the introduction of the phenomena gap and research gap. Section 2, presents the literature review and how hypothesis developed. Next, section 3 analyses the methodology including sample, variable measurement and data analysis. Section 4 discusses the results of data analysis. Finally, section 5 which present the conclusion of this paper.

## 2. LITERATURE REVIEW

Social contract theory reveals social relations in society to create harmony, and balance including the environment. The social contract implicitly implies a mutual agreement (Jeet, 2022). On the one hand, legitimacy is given by the community for the existence of a firm. On the other hand, economic benefits must be provided by a firm to the community (Prayogo, 2011) Therefore, the firm and society are reciprocal or influence each other. A social contract is needed to protect each party's interests for a balance to occur between the two. Good environmental performance can indicate that the firm has carried out its responsibility to fulfil its social contract with the community. Then the community will give trust and legitimacy to the firm so that a balance can be achieved. Hence, the audit committee has consequence to make sure that company can reach the society expectation. The social contract theory believe that companies should show their power to the society.

The stakeholder theory believes the firm as an entity that must fulfil the interests of all its stakeholders, not only to fulfil its interests (Dewi & Wirasedana, 2017). Firm stakeholders include employees, managers, suppliers, creditors, the government, and the entire community around the firm (Hidayah et al., 2020). One form of fulfilling the community's interests, the firm care and protects the environment. The environment is where the community lives, so it has an important role. People have hope for a sense of security and comfort so that the environment must be preserved. Therefore, the firm's operational activities should not pollute or damage the environment but instead have a good impact. In line with the natural-resource-based theory that firm should actively to harmonize their relationship with the environment (Rehman et al., 2021). Hence, firm needs a unit to control everything run properly. The existence of audit committee could encourage the environmental performance.

In addition, type of industry could give any impact for company performance. The low-profile company tends to low environmental performance. Then, high-profile company tends to have higher environmental performance. This condition suitable with the stakeholder theory. The stakeholder will give more attention to companies that have high activities like manufacturing companies, mining companies and so on. On the other hand, the public does not pay much attention to the behaviour of low-profile companies. This is because the activities of low-profile companies are not conspicuous to environmental damage. Hence, the company will be able to improve the efficiency of its performance if it is able to balance the needs of stakeholders (Hassouna & Salem, 2021)

### 2.1 The type of industry, and environmental performance

The size of the firm can influence the environmental performance. Firm size company determines the extent of the company's environmental scanning (Aldehayyat, 2015). Moreover, the large companies have a greater responsibility for environmental sustainability. Hence, this study uses firm size for moderating variable. The larger the size of the company, the greater the resources to finance environmental



performance improvements. Big companies also tend to get more public attention so they will put in more effort to maintain their good image. This will motivate the company to have a good environmental performance. The large company sizes tend to have more complex operating activities that will have an impact on the environment. Therefore, the wider scope of audit committee review is able to improve environmental performance. The more problems are found, the audit committee holds more frequent meetings to follow up on these problems so that they are immediately resolved and prevent the impact from spreading further. Therefore, firm size is thought to moderate the effect of industry type and audit committee activity on environmental performance.

The type of industry shows the level of sensitivity of the operational process in company that gives impact on society and the environment. The type of company industry is divided into 2, namely high-profile industry and low-profile industry (Sari, 2012). High-profile companies are more easily highlighted by the public if they make mistakes and fail in their operations. In contrast to small companies, which receive less attention because the community considers that the environmental impact caused is not too significant. This is because the public is aware that the activities of high-profile companies have a higher risk of having a negative impact on the environment. More attention from the public encourages the company to maintain and continue to strive to create a good image. Public attention will also encourage companies to have better environmental performance (Cheng & Liu, 2018). Social responsibility shows the company's awareness that it wants to provide benefits to the community in return for the recognition it gives to the company. This reciprocal relationship is in accordance with the social contract theory which states that the social contract implicitly implies a mutual agreement where on the one hand, legitimacy is given by the community for the existence of a company, and on the other hand economic benefits must be provided by a company to the community (Prayogo, 2011).

In addition, compared to low profile companies, high profile companies have operating activities that are more closely related to nature or environment. Therefore, high profile companies feel they have a higher responsibility to contribute to environmental management because their industrial activities have a greater risk of causing

environmental pollution, so high-profile companies are encouraged to improve their environmental performance. Especially if the company is a large company which of course has more complex operating activities. Large companies strive to achieve high production targets to meet market needs. The company's operating activities generate residues in the form of waste. The production of polluting companies is considered a serious problem affecting the environment (Chen et al., 2021). The higher the operating activity, the more waste will be generated. Large companies pay high attention to the social and environmental impacts of their operating activities because these have an important impact on their image (Tania & Herawaty, 2019). Larger companies are able to provide more resources to support the company's social and environmental policies (Crisóstomo et al., 2019). The capability shown by the available resources supports the company to implement CSR programs so as to improve its environmental performance.

*H1: The type of industry has a positive effect on environmental performance*

## **2.2 Audit committee, and environmental performance**

The activities of the audit committee relate to its duties and responsibilities as a committee formed by the board of commissioners who assists it in carrying out its functions. **The duties and responsibilities of the audit committee include reviewing financial information that will be issued by the company to the public or other parties in the form of financial reports, projection reports, and other reports related to the company's financial information; conduct a review of compliance with laws and regulations and so on (Otoritas Jasa Keuangan, 2015). In addition, based on social contract theory argue that company should care with the environment to show the existence of company. Top management have direct impact on environmental performance (Haldorai et al., 2022). Hence, audit committee has a vital role to make sure that everything runs well to achieve higher environmental performance.**

The audit committee works independently without taking sides with any party. There is no interest that is more priority than the objectives of the company. This principle helps the company to position itself as an entity that must provide

benefits to all its stakeholders. Company stakeholders include employees, managers, suppliers, creditors, government, and the community (Hidayah et al., 2020).

According to stakeholder theory, the companies have to pay attention on stakeholder interests. Therefore, the audit committee helps fulfil the balanced interests of the company and the stakeholder. The company wants legitimacy and trust from the community, while the community wants contributions or social benefits from the company. The balanced reciprocal relationship between the two is in accordance with the social contract theory. The audit committee have to review the compliance of the company's activities with environmental regulations, and to review risk management activities. When the audit committee finds violations of the law and it will give a negative impact on society and the environment, so the audit committee can discuss the solution at the audit committee meeting. The audit committee meeting frequency has a substantial role on company performance (Al-Matari, 2022). In addition, meetings are used to discuss and decide policies related to environmental issues (Chariri et al., 2017). The meeting will produce a decision as a solution to the problems that occur. The parties present at the meeting can also discuss new breakthroughs to prevent the problem from recurring or preventive measures to prevent other problems that may occur.

*H2: Audit committee has a positive effect on environmental performance*

### **2.3 Firm size moderates the relationship between type of industry and environmental performance**

Company size is one of the benchmarks for the success of a company. The larger the size of a company it will encourage a positive relationship between the type of industry and environmental performance. Industries with high profile types and supported by large company sizes have a good effect on environmental performance. High-profile companies will be more concerned with the surrounding environmental conditions. The ability of large resources that will cover the needs of environmental conservation. Moreover, today's socio-economic life has changed where companies must really pay attention to the surrounding conditions (Alhares, et al., 2021). The existence of large company resources will be used for the interests of stakeholders by improving

environmental performance (Sari & Ulupui, 2013)

Based on stakeholder theory that stakeholders need information and bonds from the company. The bond here is in the form of fulfilling the rights and expectations of stakeholders. This stakeholder is more comprehensive, including internal and external stakeholders (Crifo & Rebérioux, 2016)The company must be able to achieve the organizational goals that have been targeted. In addition, the company must also be able to meet community expectations such as environmental sustainability around the company, improving the welfare of the community around the company's area. From the government side, companies must be able to comply with government regulations and pay taxes to the government. Hence, the existence of large assets owned by high-profile companies will be able to encourage the achievement of maximum environmental performance.

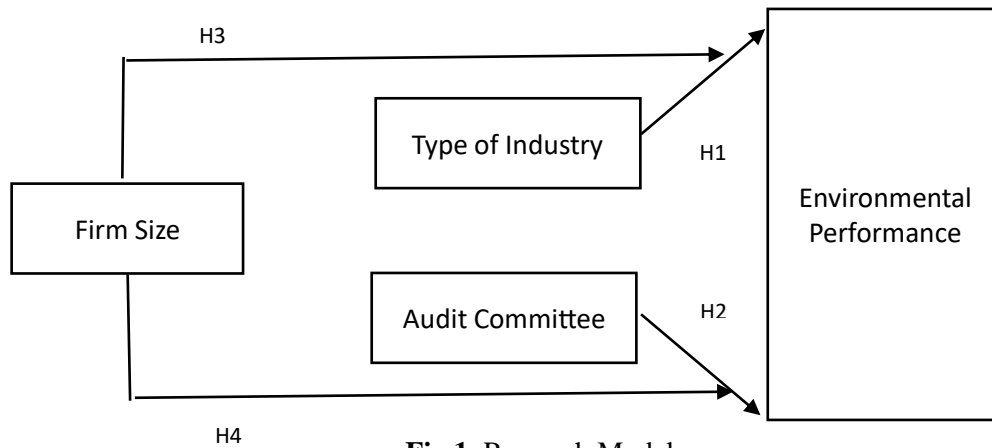
*H3: Firm size moderates the relationship between type of industry and environmental performance*

### **2.4 Firm size moderates the relationship between audit committee and environmental performance**

Company size is an important factor in a business process. The size of the company will determine the company's position in the eyes of national and international. Therefore, the larger the size of the company will be able to provide more facilities for the audit committee to conduct various kinds of training and increase its competence. In addition, the size of the company will encourage the audit committee to be more focused and more integrated in the company's activities, especially in terms of environmental performance. Human resources who understand environmental performance are urgent for the company (Ahmad et al., 2021). This is because the current environmental performance has become one of the important factors. In addition, the rise of innovation in organizational management has encouraged companies to implement strategic sustainability behaviour (Rodríguez-Espíndola et al., 2022). This condition requires the audit committee to be able to monitor the implementation of strategic sustainability behaviour in the company's operational processes. The role of audit committee in big companies is very important. According to social contract theory the bigger companies should show to the

public about their ability to control the operation of company. Moreover, the companies need recognition from the society. Hence, the audit committee in bigger companies will more powerful to control achievement of environmental performance. The larger the size of the company,

the audit committee will meet more often to ensure maximum environmental performance.  
*H4: Firm size moderates the relationship between audit committee and environmental performance*



**Fig 1.** Research Model

#### 4. RESEARCH METHODOLOGY

##### a. Sample selection

The research population is companies that listed on the Indonesia Stock Exchange and participated in PROPER in 2017-2019. The total population is 75 companies. The sampling technique used a *purposive sampling*, which means the sample was selected based on specific criteria (see Table 1.). The company sample is 66 companies. Since the research used three years data then the total unit of analysis is 198 units of analysis. This study uses a deductive approach with a quantitative method. Data sources from annual reports and sustainability report from companies. The researcher also conducted a literature study

through several literatures such as books, articles, laws and other sources.

##### b. Measurement of the variables

This study has independent variables, dependent variables and moderating variables. The dependent variable is environmental performance. The independent variables consist of type of industry and audit committee. Furthermore, the moderating variable is company size. The measurement of environmental performance used firms rank PROPER. Then the measurement of type of industry used dummy variable (1 for high-profile and 0 for low-profile). For audit committee measured by the number of meetings during a year. Finally, the firm size used Ln of total asset (see Table 2.).

**Table 1.** Sample Selection Criteria

No	Criteria	Amount
1	The firm is listed on the Indonesia Stock Exchange and participates in PROPER 2017-2019	75
2	The firm does not issue financial statements for 2017-2019	(5)
3	The firm's financial statements do not have the complete data needed in the research	(4)
Research sample firms		66
Number of units of analysis (number of research sample firms x 3 years)		198

**Table 2.** Variable Operational Definition

Variable	Definition	Measurement
Environmental Performance	Environmental performance is the firm's performance in creating a suitable environment (Suratno et al., 2007).	Firms rank in PROPER: 5 (gold), 4 (green), 3 (blue), 2 (red), 1 (black) (Yuyetta et al., 2017).
Type of Industry	The type of industry is related to the level of sensitivity of the firm to produce a negative impact on its activities on the environment (Yuyetta et al., 2017).	Industry type = 0 ( <i>low profile</i> firm) 1 ( <i>high profile</i> firm) (Sari, 2012).
Audit Committee	Activities in the form of meetings and audit meetings can discuss and converse about policies related to environmental issues (Yuyetta et al., 2017).	Audit committee activity t = number of meetings in one year (Yuyetta et al., 2017)
Firm Size	Classification of the size of a firm (Kustina, 2020)	Firm size = Ln Total Assets (Harsono et al., 2012).

### 3.3 Model specifications

The data analysis used descriptive analysis and ordinal regression, then moderating regression analysis (MRA). This study uses ordinal regression because the dependent variable, namely environmental performance, has categorical data, which is worth 1, 2, 3, 4, or 5. Before testing the hypothesis, a regression model feasibility test is carried out first and a test to assess the model fit. The research model formed is:

$$KNL = \alpha + \beta_1 ZTPI + \beta_2 ZAKA + \beta_3 ZUKP + \beta_4 |ZTPI - ZUKP| + \beta_5 |ZAKA - ZUKP| + e \quad [1]$$

Where:

KNL : Environmental Performance

$\alpha$  : Regression constant

$\beta_i$  : Regression coefficient, where  $i = 1, 2, 3, \dots$  (independent variable)

ZTPI : Z score of type of industry

ZAKA : Z score from audit committee meeting

ZUKP : Z score of firm size

$|ZTPI - ZUKP|$  : Absolute value of Z score TPI – Z score SIZE

$|ZAKA - ZUKP|$  : Absolute value of Z score AKA – Z score SIZE

e : Error

## 4. RESULTS

Descriptive statistical analysis shows a description of the profile of each variable. For environmental performance, most of them have a relatively good environmental performance, as indicated by a blue rating of 74.7% and a green rating of 13.6% of the total.

**Table 3.** Descriptive Statistics of Environmental Performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2,00	18	9,1	9,1	9,1
	3,00	148	74,7	74,7	83,8
	4,00	27	13,6	13,6	97,5
	5,00	5	2,5	2,5	100,0
	Total	198	100,0	100,0	

Based on Table 4 Descriptive Statistics of type of industry shows most of the firms are *high-profile* firms with high sensitivity to

the environment. Hence, the larger firms then the higher their responsibility to environment.

**Table 4.** Descriptive statistics of type of industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,00	27	13,6	13,6	13,6
	1,00	171	86,4	86,4	100,0
	Total	198	100,0	100,0	

Table 5 shows the maximum meeting for audit committee is 45 times. Then, the minimum of meeting is one time which is happened in PT Trisula Textile Industries Tbk in 2017. In 2018

and 2019, the maximum meeting is owned by PT Semen Indonesia (Persero) Tbk. In conclusion, the average meeting for audit committee meetings four times a year.

**Table 5.** Descriptive statistics of audit committee activity

	N	Minimum	Maximum	Mean	Std. Deviation
AKA	198	1,00	45,00	8,5051	8,89233
Valid N (listwise)	198				

Table 6 shows the minimum value of firm size was owned by PT Mustika Ratu Tbk in 2017, while the maximum value was owned by PT

Indah Kiat Pulp & Paper Tbk in 2018. The standard deviation is smaller than the average value, meaning that the data has an even distribution.

**Table 6.** Descriptive statistics of firm size

	N	Minimum	Maximum	Mean	Std. Deviation
UKP	198	13,12	18,66	15,7650	1,49333
Valid N (listwise)	198				

Table 7 show the *final* value of overall model fit test results is less than the *intercept-only* value, or there is a decrease in the value of *-2 Log Likelihood*. A significance value less than 0.05 indicates that the model is considered fit. It is mean that the model becomes better with the

addition of independent variables into the regression model and this research model is fit. In addition, Table 8 show the significance value of Pearson and Deviance is more than 0.1 so the model is fit, Hence, the regression model is feasible to be used in further analysis.

**Table 7.** Overall model fit test results

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	316,856			
Final	266,825	50,031	5	,000

**Table 8.** The results of the regression model feasibility test (goodness of fit test)

	Chi-Square	df	Sig.
Pearson	438,129	586	1,000
Deviance	266,825	586	1,000

Based on the regression shows the H1 is accepted because the significance value is 0.017 which is lower than 0.05. Then H2 is accepted because the significance value is 0.002 which is lower than 0.05. Therefore, audit committee has a positive effect on environmental performance. In addition,

the value of significance H3 is 0.025 which is lower than 0.05 so H3 accepted. Hence, firm size can moderate the relationship between type of industry and environmental performance. However, H4 is rejected because the significance level is more than 0.05.

**Table 9.** Hypothesis test results

Hypothesis	Coef.	Sig.
H1: The type of industry has a positive effect on environmental performance	0,275	0,017
H2: Audit committee has a positive effect on environmental performance	0,366	0,002
H3: Firm size moderates the effect of industry type on environmental performance	0,391	0,025
H4: Firm size moderates the effect of audit committee activities on environmental performance	0,084	0,636

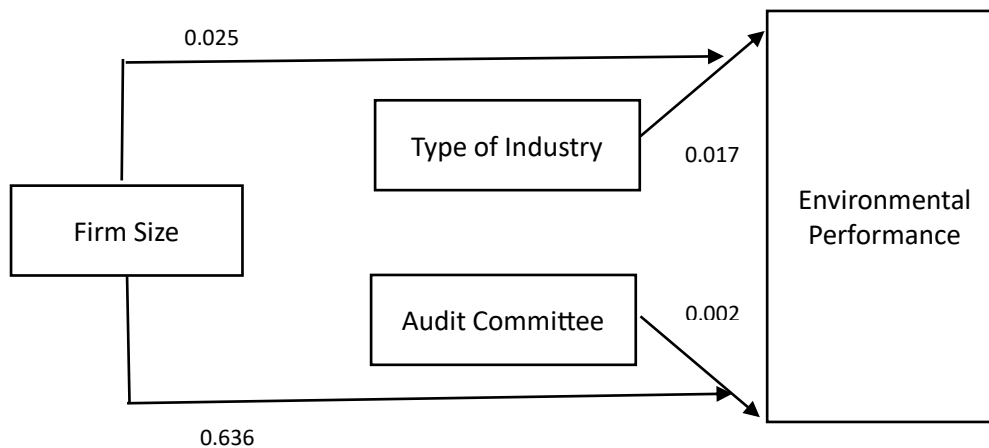


Fig 1. Result

## 6. DISSCUSSION

The result of regression shows the type of industry proved to have a positive effect on environmental performance. This result is in line with the stakeholder theory, where in addition to fulfilling its interests, the firm must fulfil the interests of the community, in this case, the interests of feeling safe and comfortable living in a sustainable environment. The type of industry shows the level of sensitivity of the firm in producing negative impacts on the environment. This sensitivity classifies firms into two types, namely high profile and low profile. High-profile firms are more sensitive, so they are easier to spot. Therefore, high-profile firms constantly strive to create and maintain a good image through good environmental performance. Public attention will

encourage firms to have better environmental performance (Cheng & Liu, 2018). The environmental aspect has a significant effect on the firm's image to build a positive firm image, and this environmental aspect is crucial to pay attention to (Juri & Sailawati, 2020). The industry is an essential factor in influencing environmental performance based on how sensitive the firm responds to environmental issues (Nasir et al., 2019). High-profile firms feel they have a higher responsibility to contribute to environmental management because the impact on the environment tends to be greater than low-profile firms. High-profile firms have higher environmental performance than low-profile firms (Rachman, 2013). Firms with high sensitivity to the environment have environmental performance following applicable laws and

regulations (Yesika & Chariri, 2013). The more sensitive the firm, the better its environmental performance. The results of this study are in line with the results of research that type of industry gives positively impacts on environmental performance (Yuyetta et al., 2017; Nasir et al., 2019; Garcia et al., 2017; Crisóstomo et al., 2019; Yesika & Chariri, 2013; and Paramita, 2015).

Subsequent evidence, the audit committee's activities proved to affect environmental performance in a positive direction. The audit committee's activities are related to implementing their duties and responsibilities that uphold independence so that each action does not favor one group, in line with stakeholder theory and social contract theory. The duties and responsibilities of the audit committee that are closely related to the environment are to review the compliance of the firm's activities with the laws and regulations and review risk management activities if there is no risk monitoring function under the board of commissioners. The audit committee is responsible for monitoring risk management policies, including the risk of firm activities that can cause negative impacts on the environment (Yuyetta et al., 2017). The audit committee has an essential role in overseeing firm policies related to environmental issues (Trotman & Trotman, 2015). The results of the study found were discussed through the audit committee meeting to discuss the next steps. From the meeting, a decision was made as a solution to overcome the problems found. The readiness of the audit committee in dealing with problems also affects environmental performance. When the audit committee finds risk management activities that are not working correctly, the audit committee can communicate the findings to the parties involved. The results of these communications are discussed through audit committee meetings as material for evaluation and finding solutions. This will maximize risk management activities to minimize the negative impact of the firm's operations on the environment. The higher the frequency of audit committee meetings, the better the firm's environmental performance. These results are in line with the results of research (Yuyetta et al., 2017; Wijayanti, 2016).

Firm size is proven to moderate the influence of industry type on environmental performance seen from the significance value obtained of 0.025 less than 5%. Following stakeholder theory and

social contract theory, the firm fulfils the interests of all stakeholders, including society and the environment. High-profile firms with high sensitivity tend to minimize the environmental impact, especially if they are large firms with sufficient resources to finance it. Resources are essential and needed to realize programs that aim to improve the firm's environmental performance. Larger firms can provide more resources to support corporate social and environmental policies (Crisóstomo et al., 2019). Large firms tend to finance efforts to improve environmental performance and have better environmental investment policies (Tiurmalı et al., 2018). In addition, large firms have more complex operating activities. Large firms strive to achieve production targets to meet market needs. The production of polluting firms is considered a severe problem affecting the environment (S. Chen et al., 2021). The higher the operating activity, the more waste/pollution will be generated. People will be increasingly worried about the increasing intensity of waste and the risk of harming the environment if it is not appropriately managed. Firms are encouraged to make more efforts in overcoming this problem. Large firms pay great attention to social and environmental impacts due to their operating activities because these have an important impact on their image (Tania & Herawaty, 2019). High public demands for environmental protection encourage companies to innovate and improve their performance to ensure their legitimacy (Cheng & Liu, 2018). The implementation of good environmental management has a big impact on improving the company's good image (Sari & Ulupui, 2013). Moreover, good environmental performance can avoid management scandals (Alhares et al., 2021). Companies with large total assets have more funds to invest in technology and sound environmental management. This encourages companies to have good environmental performance and motivates them to disclose information in order to maintain the company's reputation (Yusnita, 2010). High sensitivity supported by adequate resources and motivation to maintain a good image encourages firms to improve their environmental performance.

On the other hand, firm size proved unable to moderate the effect of audit committee activities on environmental performance seen from the significance value obtained at 0.636 more than 5%. This result is contrary to stakeholder theory

and social contract theory, where the more significant the firm, the more it will try to continuously improve its performance. Moreover, the firm want to gain legitimacy and a good image then meet the growing demands of society. This study failed to prove the influence of firm size, which was considered capable of moderating the effect of audit committee activities on environmental performance. Firm size did not affect the frequency of audit committee meetings held by a firm. This condition due to the awareness of audit committee, whether big firm or small they have a strict job description that must be done. The data of this study support this estimate. Large firms such as PT Indah Kiat Pulp & Paper Tbk and PT United Tractors Tbk hold audit committee meetings four times a year and receive a blue rating in PROPER. Meanwhile, small firms such as PT Trisula Textile Industries Tbk, PT Prasadha Aneka Niaga Tbk, and PT Tirta Mahakam Resource Tbk also hold audit committee meetings four times a year and get the same rating, namely blue rating in PROPER. Large firms that are considered to have a broader scope do not guarantee a high frequency of audit committee meetings. On the other hand, small firms do not necessarily have a low frequency of audit committee meetings cause the minimum number of meetings already regulated by the government policy.

## 6. CONCLUSION

In this research we emphasized the role of form size on environmental performance in Indonesia. The type of industry and the audit committee have a significant positive effect on environmental performance. In accordance with the social contract theory, type of industry especially for high-profile companies will try their best to show their presence in the community. One way is to achieve maximum environmental performance. The company demonstrates its legality and power to be recognized by the public and the government. Hence, the company has a bargaining position for the sustainability of its business.

The audit committee has an effect on the achievement of the company's environmental performance. The high and low effectiveness of audit performance has an impact on company performance, especially environmental performance. The role of the audit committee is

the main key in monitoring all company activities that are in harmony with the environmental balance. Hence, the companies should improve audit committee effectiveness to reach higher environmental performance.

Going more depth, the firm size can moderate the effect of industry type on environmental performance. The bigger size of asset in high-profile companies will lead to higher environmental performance. The availability of abundant resources, especially in the asset sector, has been able to encourage companies to maximize environmentally conscious behaviour. Hence, firms that have large sizes must improve environmental performance to maintain the firm's sustainability.

On the other hand, firm size cannot moderate the effect of audit committee activities on environmental performance. The audit committee is not affected by the size of the company in ensuring the achievement of the company's environmental performance. The audit committee works under the audit committee charter. In addition, the audit committee is also bound by a code of ethics, whatever the condition of the company will not affect its independence and professionalism in carrying out its duties and functions.

This paper contribute to the company's management practices specially to maintain a position as a high-profile company for better environmental performance. In addition, the companies should improve the effectiveness of audit committee to realize the maximum environmental performance. Last, but not least, the government should make the strict policy related for environmental sustainability to avoid severe natural damage. This research limitation is only covered PROPER firms so it could not be generalized for all companies. Further research should use companies from many sectors. and use firm size as an intervening variable to determine the extent of the role of firm size on environmental performance comprehensively.



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## **6. Hasil Review Tahap 2:**

**Pihak Virtus Interpress menerima revisi artikel tahap 1 dan memberikan Letter of Acceptance conditional (29 Juni 2024)**

 **Olha Lytvynenko** <olha.lytvynenko@virtusinterpress.org>  
kepada saya ▾

29 Jun 2022, 18.51 ☆ ↶ ⋮

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Dear Retnoningrum Hidayah,  
thank you for your reply.

I am happy to inform you that your paper has been accepted for publication in the journal *Corporate & Business Strategy Review* (under the condition of English language proofreading) in July 2022. In attachment you'll find the Letter of Acceptance.

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**Olha Lytvynenko** <olha.lytvynenko@virtusinterpress.org>

29 Juni 2022 pukul 18.51

Kepada: Retnoningrum Hidayah <retnoningrum.hidayah@mail.unnes.ac.id>

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## LETTER OF PAPER ACCEPTANCE

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TO/ATTN: Retnoningrum Hidayah  
Accounting Department  
Universitas Negeri Semarang  
Semarang  
INDONESIA

Dear Retnoningrum Hidayah,

herewith it is certified that the paper titled "*The role of firm size on environmental performance in the developing country*" co-authored by Retnoningrum Hidayah, Dhini Suryandari, Trisni Suryarini, Sukirman, Ima Nur Kayati, Rahayu Dinassari, and Fian Tri Rohmah has been blind reviewed and accepted for publishing in the issue of the journal *Corporate & Business Strategy Review* (ISSN – 2708-9924 (printed version), ISSN – 2708-4965 (online version)) in July 2022 (under the condition of English language proofreading).

Director, Virtus Interpress,  
Oleksandr Kostyuk



**7. Lanjutan Hasil Review Tahap 2:  
Pihak Virtus Interpress mengirimkan  
catatan hasil review tahap 2  
(12 Juli 2022)**





Daryna Chorna <d.chorna@virtusinterpress.org>  
kepada saya ▾

Sel, 12 Jul 2022, 19.07 ★ ↶ ⋮



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Best regards,  
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Daryna Chorna <d.chorna@virtusinterpress.org>

12 Juli 2022 pukul 19.07

Kepada: retnoningrum.hidayah@mail.unnes.ac.id

Dear Retnoningrum Hidayah,

Please find attached the layout of the paper to be published in the issue of the journal *Corporate and Business Strategy Review*.

There are several things I would ask you to do by **July 13**:

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Best regards,  
Daryna Chorna

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## Lampiran: Catatan dari pihak Virtus Interpress tentang Revisi Tahap 2

# THE ROLE OF FIRM SIZE ON ENVIRONMENTAL PERFORMANCE IN THE DEVELOPING COUNTRY

Retnoningrum Hidayah<sup>\*</sup>, Dhini Suryandari<sup>\*\*</sup>, T. Sukirman<sup>\*\*</sup>, Ima Nur Kayati<sup>\*\*</sup>, Fian Tri Rohmah<sup>\*\*</sup>

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Contact details: Accounting Department, Universitas Negeri Semarang, Kampus ...  
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JEL Classification: G3, G32, M14, M41  
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The balance between economic development and environmental performance is very important for human life (Zhang, Geng, & Wei, 2022; Haldorai, Kim, & Garcia, 2022). This study aims to examine the role of firm size on the relationship between the type of industry and the audit committee on environmental performance. The sample consisted of 198 units of analysis. The method used descriptive analysis and ordinal regression analysis with an absolute difference value test for moderation. The results show the type of industry and the audit committee positively affect environmental performance. In addition, firm size could moderate the relationship between the type of industry and environmental performance. However, firm size failed to moderate the relationship between the audit committee and environmental performance. This research limitation is only covered the Rating Program in Environment Management Performance (PROPER) firms. This research is the first model to investigate the role of firm size on the relationship between the type of industry, the audit committee, and environmental performance. This paper gives more knowledge for government to make strict policies related to the environmental problem to avoid severe natural damage in Southeast Asia, especially in Indonesia. This study contributes to the literature on company's management practices. A firm should encourage the audit committee's effectiveness and improve the asset to achieve better environmental performance.

Keywords: Audit Committee, Environmental Performance, Firm Size, Type of Industry

Authors' individual contribution: Conceptualization – R.H.; Methodology – D.S.; Software – R.D.; Validation – F.T.R. and I.N.K.; Formal Analysis – T.S.; Investigation – R.H.; Resources – S.; Data Curation – F.T.R.; Writing – Original Draft – R.H.; Writing – Review & Editing – D.S.; Visualization – T.S.; Supervision – S.; Project Administration – I.N.K., R.D., and F.T.R.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

## 1. INTRODUCTION

this opportunity to obtain maximum profit.

## Comments 7

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### Page 1

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environmental destruction. These impacts can threaten the sustainability of living things because the environment is a place to run life.

Forest and land fires certainly have negative impacts, including damage to the habitats/places of living creatures that have the potential to threaten their survival so, that in the long term, it is feared that it can reduce biodiversity, disrupt biological balance and plant metabolic systems, smoke disturbances that cause air pollution and pollution. Limited visibility, erosion, flooding, landslides, and increased levels of greenhouse gases and carbon dioxide. The improvement of economic and environmental performance is very important for human life (Zhang, Geng, & Wei, 2022; Haldorai, Kim, & Garcia, 2022).

The increasing pollution caused by the company shows the poor management of the company. This triggers low environmental performance and has a bad impact on the company (Firmansyah, Qadri, & Arfiansyah, 2021). The company's environmental performance is also related to the company's industry type. High-profile companies have better environmental performance than low-profile companies. Previous research revealed that the type of industry has a significant positive effect on environmental performance (Yesika & Chariri, 2013) contrary to the research results that state the type of industry does not affect environmental performance (Turumali, Rokhmawati, & Fathoni, 2018; Sari & Utupui, 2013).

Going more depth, the development of industrial activities in the plantation sector has changed its function into an industrial area. Land damage is caused by illegal logging, which clears land by burning. The law has ensnared several firms due to forest and land fires in recent years. PT Sumber Sawit Sejahtera in Indonesia was found guilty of land fires in February 2019, which caused state losses of Rp 55 billion. A similar case happened to PT National Sago Prima, which was sued for a 3,000-hectare land fire in 2015 in Riau. The lawsuits against both were won by the Ministry of Environment and Forestry of the Republic of Indonesia. PT Sumber Sawit Sejahtera was found guilty of fire on 400 hectares of its concession area and was required to pay compensation of Rp 160 billion, while PT National Sago Prima was found guilty, and the total dividend to be paid was 319 billion-plus recovery costs of 753 billion. The cases above are a small part of the confirmed cases that occurred in Indonesia. The area of forest and land fires in all regions in Indonesia from 2017 to 2019 is 2,344,006.56 hectares (SiPongi, 2020). Environmental problems due to the firm's operations

are also found by PT Pindo pollute the into the Cili Regency Forest stopped Decree No. 6601/927/PPL dated April 29, 2019.

The cases above show that the firm's responsibility in overcoming the impact of its operations on the environment is still lacking, or its environmental performance is still low. Therefore, the audit committee as a control structure is considered to have also contributed to this condition. The audit committee plays a role in

achieving the company's environmental performance.

The activity of the audit committee has a positive effect on environmental performance (Chariri, Januari, & Yuyetta, 2017). Hence, the role of the audit committee is very important. The activities of the audit committee have a positive effect on environmental performance (Wijayanti, 2016). However, this contradicts the results of research which show that audit committee activities do not affect environmental performance (Yesika & Chariri, 2013). Moreover, one of the factors that cannot give an impact on improving the company's environmental performance is the audit committee (Tania & Heraway, 2019; Chariri, Nasir, Januari, & Daljono, 2019; Yusnita, 2010; Kusumawati, 2017). Moreover, some researchers argue that sensitive industry has a significant effect on environmental performance (Garcia, Mendes-Da-Silva, & Orsato, 2017). Next, better environmental performance is owned by companies with high environmental sensitivity or high-profile companies (Crisóstomo, Freire, de Souza, & Oliveira, 2019). Moreover, the type of industry has a positive and significant effect on environmental performance (Chariri et al., 2017). The type of industry also gives an impact on environmental investment (Chariri et al., 2019; Chen & Hamilton, 2020; Paramita & Chariri, 2013). Environmental performance is very important for social life. Hence, this research elaborates on firm size, the type of industry, and the audit committee to evaluate the environmental performance of the Rating Program in Environment Management Performance (PROPER) companies. This research has never been conducted before. Moving from the consideration above, we address four research questions:

RQ1: Does the type of industry have a positive effect on environmental performance?

RQ2: Does the audit committee have a positive effect on environmental performance?

RQ3: How is firm size able to moderate the relationship between the industry type and environmental performance?

RQ4: How is firm size able to moderate the relationship between the audit committee and environmental performance?

The structure of the research is as follows. Section 1 provides the introduction of the phenomena gap and research gap. In Section 2, the literature is reviewed and hypotheses are developed. Section 3 analyses the methodology including the sample, variable measurement, and data analysis. Section 4 presents the results of the data analysis. Section 5 discusses the research results. Section 6 concludes this paper.

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theory reveals social relations in harmony and balance including The social contract implicitly implies a mutual agreement (Jeet, 2022). On the one hand, legitimacy is given by the community for the existence of a firm. On the other hand, economic benefits must be provided by a firm to the community (Prayogo, 2011). Therefore, the firm and society are reciprocal or influence each other. A social contract is needed to protect each party's

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## 2.2. The audit committee and environmental performance

The activities of the audit committee related to its duties and responsibilities as a committee is formed by the board of commissioners who assists it in carrying out its functions. The duties and responsibilities of the audit committee include reviewing financial information that will be issued by the company to the public or other parties in the form of financial reports, projection reports, and other reports related to the company's financial information; conducting a review of compliance with laws and regulations and so on (Otonitas Jasa Keuangan Republik Indonesia, 2015). In addition, based on social contract theory it is argued that a company should care about environment to show its existence of the company. The top management has a direct impact on environmental performance (Haldorai et al., 2022). Hence, the audit committee has a vital role to make sure that everything runs well to achieve higher environmental performance.

The audit committee works independently without taking sides with any party. There is no interest that is more priority than the objectives of the company. This principle helps the company to position itself as an entity that must provide benefits to all its stakeholders. Company stakeholders include employees, managers, suppliers, creditors, government, and the community (Hidayah et al., 2020).

According to stakeholder theory, companies have to pay attention to stakeholders' interests. Therefore, the audit committee helps fulfil the balanced interests of the company and the stakeholder. The company wants legitimacy and trust from the community, while the community wants contributions or social benefits from the company. The balanced reciprocal relationship between the two is in accordance with the social contract theory. The audit committee has to review the compliance of the company's activities with environmental regulations and review risk management activities. If the audit committee finds violations of the law and it will give a negative impact on society and the environment, the audit committee can discuss the solution at the audit committee meeting. The audit committee meeting frequency has a substantial role in company performance (Al-Matari, 2022). In addition, meetings are held to discuss and decide policies related to environmental issues (Charin et al., 2017). The meeting will decide on a solution to the problems that occur. The parties present at the meeting can also discuss breakthroughs to prevent the problem from recurring or some measures to prevent other problems that may occur.

H2: The audit committee has a positive effect on environmental performance.

## 2.3. Firm size moderates the relationship between the type of industry and environmental performance

Company size is one of the benchmarks for the success of a company. The larger size of

the surrounding environmental conditions. The ability of large resources will cover the needs of environmental conservation. Moreover, today's socio-economic life has changed and companies must really pay attention to the surrounding conditions (AlHares, Abu-Asi, Dominic, & Al Abed, 2021). The existence of large company resources will be used in the interests of stakeholders by improving environmental performance (Sari & Ulupui, 2013).

Based on stakeholder theory that stakeholders need information and bonds from the company. The bond here is in the form of fulfilling the rights and expectations of stakeholders. This stakeholder is more comprehensive including internal and external stakeholders.

The company must the organizational goal. In addition, the company community expectation sustainability around the welfare of the company area. From the government able to comply with government taxes to the government.

large assets owned by high-profile companies will be able to encourage the achievement of maximum environmental performance.

H3: Firm size moderates the relationship between the type of industry and environmental performance.

## 2.4. Firm size moderates the relationship between the audit committee and environmental performance

Company size is an important factor in a business process. The size of the company will determine the company's position in the eyes of national and international. Therefore, the larger size of the company will be able to provide more facilities for the audit committee to conduct various kinds of training and increase its competitiveness. In addition, the size of the company will encourage the audit committee to be more focused and more integrated into the company's activities, especially in terms of environmental performance. Human resources who understand environmental performance are urgent for the company (Ahmad et al., 2021). This is because the current environmental performance has become one of the important factors. In addition, the rise of innovation in organizational management has encouraged companies to implement strategic sustainability behaviour (Rodriguez-Espindola et al., 2022). This condition requires the audit committee to be able to monitor the implementation of strategic sustainability behaviour in the company's operational processes. The role of the audit committee in big companies is very important. According to social contract theory, the bigger companies should show the public their ability to control the operation of the company. Moreover, the companies need recognition from society. Hence, the audit committee in bigger companies will be more powerful to control the achievement of environmental performance. The larger the size of the company, the audit committee will meet more

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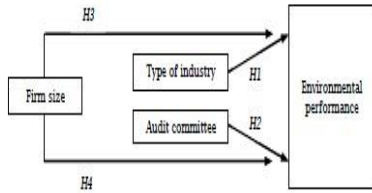
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Figure 1. Research model



3. RESEARCH METHODOLOGY

3.2. Measurement of the variables

3.1. Sample selection

The research population is companies listed on the Indonesia Stock Exchange and participated in PROPER in 2017-2019. The total population is 75 companies. The sampling technique used purposive sampling, which means the sample was selected based on specific criteria (see Table 1). The company sample is 66 companies. Since the researchers used three years of data then the total unit of analysis is 198 units. This study uses a deductive approach with a quantitative method. Data sources from annual reports and sustainability reports from companies. The researchers also conducted a literature study through several pieces of literature such as books, articles, laws, and other sources.

This study has independent variables, dependent variables, and moderating variables. The dependent variable is *environmental performance*. The independent variables are *type of industry* and *audit committee*. Furthermore, the moderating variable is *firm size*. The measurement of environmental performance used firms rank PROPER. Then the measurement of *type of industry* used a dummy variable (1 for high-profile and 0 for low-profile). *Audit committee* is measured by the number of meetings during a year. Finally, *firm size* used Ln of total assets (see Table 2).

Table 1. Sample selection criteria

No.	Criteria	Amount
1	The firm is listed on the Indonesia Stock Exchange and participates in PROPER 2017-2019	75
2	The firm does not issue financial statements for 2017-2019	5
3	The firm's financial statements do not have the complete data needed for the research	4
Research sample firms		66
A number of units of analysis (a number of research sample firms x 3 years)		198

Table 2. Variable operational definition

Variable	Definition	Measurement
Environmental performance	Environmental performance is the firm's performance in creating a suitable environment (Suratno, Darsono, & Mutmainah, 2007).	Firms rank in PROPER: 5 (gold), 4 (green), 3 (blue), 2 (red), 1 (black) (Chariri et al, 2017)
Type of industry	The type of industry is related to the level of sensitivity of the firm to produce a negative impact on its activities on the environment (Chariri et al, 2017).	Industry type = 0 (low-profile firm) 1 (high-profile firm) (Sari, 2012)
Audit committee	Activities in the form of meetings and audit meetings can discuss and converse about policies related to environmental issues (Chariri et al, 2017).	Audit committee activity: t = number of meetings in one year (Chariri et al, 2017).
Firm size	Classification of the size of a firm (Kustina, 2020).	Firm size = Ln total assets (Harsono, Handoko, & Fransisca, 2012)

3.3. Model specifications

The data analysis used descriptive analysis and ordinal regression, then moderating regression analysis (MRA). This study uses ordinal regression because the dependent variable, namely

*environmental performance*, has categorical data, which is worth 1, 2, 3, 4, or 5. Before testing the hypotheses, a regression model feasibility test and a test to assess the model fit are carried out. The research model formed is below:

$$KNL = a + \beta_1 ZTPI + \beta_2 ZAKA + \beta_3 ZUKP + \beta_4 [ZTPI - ZUKP] + \beta_5 [ZAKA - ZUKP] + \epsilon \quad (1)$$

where,  
 KNL: environmental performance;  
 a: regression constant;  
 $\beta_i$ : regression coefficient, where  $i = 1, 2, 3, \dots$  (independent variable);  
 ZTPI: Z-score of type of industry;  
 ZAKA: Z-score from audit committee meeting;

ZUKP: Z-score of  
 [ZTPI - ZUKP]:  
 Z-score size;  
 [ZAKA - ZUKP]:  
 Z-score size;  
 $\epsilon$ : error.

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**Page 4, Subsection 2.2:** The phrase of the sentence highlighted in grey “existence of the company” may cause comprehension hindrances. Therefore, it is suggested revising this phrase. Please revise it.

**Page 4, Subsection 2.3:** The part of the text highlighted in grey “Based on stakeholder theory that stakeholders need information and bonds from the company. The bond here is in the form of fulfilling the rights and expectations of stakeholders. This stakeholder is more comprehensive, including internal and external stakeholders (Crifo, & Rebérioux, 2016).” may cause comprehension hindrances. Therefore, it is suggested revising this part. Please revise it.

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**Bukti konfirmasi submit revisi kedua, respon**  
**kepada reviewer, dan artikel yang diresubmit**  
**Tanggal: 13 Juli 2022**



Rab, 13 Jul 2022, 15:57

**Retningrum Hidayah** <retningrum.hidayah@mail.unnes.ac.id>

kepada ima, dhini.surya, trisnisuryarini, Daryna

Dear Daryna Chorna,

We have done

If you have any question, please let us know soon

Best Regards,

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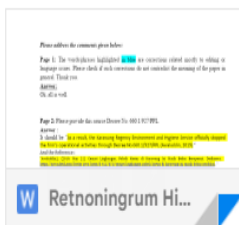
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Cc: ima@mail.unnes.ac.id, dhini.surya@mail.unnes.ac.id, trisnisuryarini@mail.unnes.ac.id

Dear Daryna Chorna,

We have **done**

If you have any question, please let us know soon

Best Regards,

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**Answer:**

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**Answer:**

It should be "As a result, the Karawang Regency Environment and Hygiene Service officially stopped the firm's operational activities through Decree No.660.1/927/PPL (Awaluddin, 2019)."

And the Reference:

Awaluddin, (2019, May 21). Cemari Lingkungan, Pabrik Kertas di Karawang Ini Masih Bekerja Beroperasi. Detiknews. <https://news.detik.com/berita-jawa-barat/d-4557870/cemari-lingkungan-pabrik-kertas-di-karawang-ini-masih-bekerja-produksi>.

**Page 4, Subsection 2.2:** The phrase of the sentence highlighted in grey "existence of the company" may cause comprehension hindrances. Therefore, it is suggested revising this phrase. Please revise it.

**Answer:**

The sentence "existence of the company" should be

"the importance of the company's presence in the community."

**Page 4, Subsection 2.3:** The part of the text highlighted in grey "Based on stakeholder theory that stakeholders need information and bonds from the company. The bond here is in the form of fulfilling the rights and expectations of stakeholders. This stakeholder is more comprehensive, including internal and external stakeholders (Crifo & Reberieux, 2016)." may cause comprehension hindrances. Therefore, it is suggested revising this part. Please revise it.

**Answer:**

It should be

"Based on stakeholders theory that stakeholders need information about the company. Therefore, the company must establish good communication with all stakeholders. These stakeholders include internal stakeholders and external stakeholders like government, suppliers, consumers, so on (Crifo & Reberieux, 2016)"

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**Answer:**

Yes, we are agreeing with you

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**Answer:**

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**Answer:**

The link is right (<https://sipongi.menlhk.go.id/>) but if we want to get the information, we have to click the "MENU" then choose "Karhutla" and click "Luas Karhutla". Next, the data is shown



And You will see the data as below:

A screenshot of the SIPongi website showing a table of fire and land burning area data (Luas Karhutla) for various provinces in Indonesia from 2017 to 2022. The table has columns for 'Provinsi', '2017', '2018', '2019', '2020', '2021', and '2022'. The data is as follows:

Provinsi	2017	2018	2019	2020	2021	2022
Aceh	3.885,16	1.284,75	750,00	1.078,00	1.267,00	1.260,00
Bali	170,00	1.011,74	371,00	28,00	0,00	0,00
Bangka Belitung	0,00	2.053,07	4.778,00	370,00	385,00	140,00
Banten	0,00	0,00	6,00	2,00	0,00	0,00
Bengkulu	1.01,04	8,82	71,00	201,00	99,00	1.506,00
DIY Jakarta	0,00	0,00	0,00	0,00	0,00	0,00
Gorontalo	0,00	750,00	1.808,00	90,00	163,00	90,00
Jawa	199,17	1.577,79	54.590,00	1.802,00	540,00	317,00
Jawa Barat	640,71	4.104,01	9.702,00	2.344,00	1.209,00	2,00

# THE ROLE OF FIRM SIZE ON ENVIRONMENTAL PERFORMANCE IN THE DEVELOPING COUNTRY

Retnoningrum Hidayah <sup>\*</sup>, Dhini Suryandari <sup>\*\*</sup>, Trisni Suryarini <sup>\*\*</sup>,  
Sukirman <sup>\*\*</sup>, Ima Nur Kayati <sup>\*\*</sup>, Rahayu Dinassari <sup>\*\*</sup>,  
Fian Tri Rohmah <sup>\*\*</sup>

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Contact details: Accounting Department, Universitas Negeri Semarang, Kampus Sekaran Gunung Pati, 50229 Semarang, Indonesia  
<sup>\*\*</sup> Accounting Department, Universitas Negeri Semarang, Semarang, Indonesia

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## Abstract

The balance between economic development and environmental performance is very important for human life (Zhang, Geng, & Wei, 2022; Haldorai, Kim, & Garcia, 2022). This study aims to examine the role of firm size on the relationship between the type of industry and the audit committee on environmental performance. The sample consisted of 198 units of analysis. The method used descriptive analysis and ordinal regression analysis with an absolute difference value test for moderation. The results show the type of industry and the audit committee positively affect environmental performance. In addition, firm size could moderate the relationship between the type of industry and environmental performance. However, firm size failed to moderate the relationship between the audit committee and environmental performance. This research limitation is only covered the Rating Program in Environment Management Performance (PROPER) firms. This research is the first model to investigate the role of firm size on the relationship between the type of industry, the audit committee, and environmental performance. This paper gives more knowledge for government to make strict policies related to the environmental problem to avoid severe natural damage in Southeast Asia, especially in Indonesia. This study contributes to the literature on company's management practices. A firm should encourage the audit committee's effectiveness and improve the asset to achieve better environmental performance.

**Keywords:** Audit Committee, Environmental Performance, Firm Size, Type of Industry

**Authors' individual contribution:** Conceptualization — R.H.; Methodology — D.S.; Software — R.D.; Validation — F.T.R. and I.N.K.; Formal Analysis — T.S.; Investigation — R.H.; Resources — S.; Data Curation — F.T.R.; Writing — Original Draft — R.H.; Writing — Review & Editing — D.S.; Visualization — T.S.; Supervision — S.; Project Administration — I.N.K., R.D., and F.T.R.

**Declaration of conflicting interests:** The Authors declare that there is no conflict of interest.

---

## 1. INTRODUCTION

The increasing need for life requires humans to continue to carry out consumption activities. As a party that fulfills the markets, the firm takes

this opportunity to obtain maximum profit. However, to achieve this, firms sometimes ignore the environmental impacts arising from their operations. The environmental effects can be in the form of environmental pollution or

environmental destruction. These impacts can threaten the sustainability of living things because the environment is a place to run life.

Forest and land fires certainly have negative impacts, including damage to the habitats/places of living creatures that have the potential to threaten their survival so, that in the long term, it is feared that it can reduce biodiversity, disrupt biological balance and plant metabolic systems, smoke disturbances that cause air pollution and pollution. Limited visibility, erosion, flooding, landslides, and increased levels of greenhouse gases and carbon dioxide. The improvement of economic and environmental performance is very important for human life (Zhang, Geng, & Wei, 2022; Haldorai, Kim, & Garcia, 2022).

The increasing pollution caused by the company shows the poor management of the company. This triggers low environmental performance and has a bad impact on the company (Firmansyah, Qadri, & Arfiansyah, 2021). The company's environmental performance is also related to the company's industry type. High-profile companies have better environmental performance than low-profile companies. Previous research revealed that the type of industry has a significant positive effect on environmental performance (Yesika & Chariri, 2013) contrary to the research results that state the type of industry does not affect environmental performance (Tiurmal, Rokhmawati, & Fathoni, 2018; Sari & Ulupui, 2013).

Going more depth, the development of industrial activities in the plantation sector has changed its function into an industrial area. Land damage is caused by illegal logging, which clears land by burning. The law has ensnared several firms due to forest and land fires in recent years. PT Sumber Sawit Sejahtera in Indonesia was found guilty of land fires in February 2019, which caused state losses of Rp 55 billion. A similar case happened to PT National Sago Prima, which was sued for a 3,000-hectare land fire in 2015 in Riau. The lawsuits against both were won by the Ministry of Environment and Forestry of the Republic of Indonesia. PT Sumber Sawit Sejahtera was found guilty of fire on 400 hectares of its concession area and was required to pay compensation of Rp 160 billion, while PT National Sago Prima was found guilty, and the total dividend to be paid was 319 billion-plus recovery costs of 753 billion. The cases above are a small part of the confirmed cases that occurred in Indonesia. The area of forest and land fires in all regions in Indonesia from 2017 to 2019 is 2,344,008.56 hectares (SiPongi, 2020). Environmental problems due to the firm's operations are also found in water areas, such as river pollution by PT Pindo Deli III in Karawang, which is proven to pollute the environment by dumping liquid waste into the Cikereteg river. As a result, the Karawang Regency Environment and Hygiene Service officially stopped the firm's operational activities through Decree No. 660.1/927/PPL (Awaluddin, 2019).

The cases above show that the firm's responsibility in overcoming the impact of its operations on the environment is still lacking, or its environmental performance is still low. Therefore, the audit committee as a control structure is considered to have also contributed to this condition. The audit committee plays a role in

achieving the company's environmental performance. The activity of the audit committee has a positive effect on environmental performance (Chariri, Januarti, & Yuyetta, 2017). Hence, the role of the audit committee is very important. The activities of the audit committee have a positive effect on environmental performance (Wijayanti, 2016). However, this contradicts the results of research which show that audit committee activities do not affect environmental performance (Yesika & Chariri, 2013). Moreover, one of the factors that cannot give an impact on improving the company's environmental performance is the audit committee (Tania & Herawaty, 2019; Chariri, Nasir, Januarti, & Daljono, 2019; Yusnita, 2010; Kusumawati, 2017). Moreover, some researchers argue that sensitive industry has a significant effect on environmental performance (Garcia, Mendes-Da-Silva, & Orsato, 2017). Next, better environmental performance is owned by companies with high environmental sensitivity or high-profile companies (Crisóstomo, Freire, de Souza, & Oliveira, 2019). Moreover, the type of industry has a positive and significant effect on environmental performance (Chariri et al., 2017). The type of industry also gives an impact on environmental investment (Chariri et al., 2019; Chen & Hamilton, 2020; Paramita & Chariri, 2013). Environmental performance is very important for social life. Hence, this research elaborates on firm size, the type of industry, and the audit committee to evaluate the environmental performance of the Rating Program in Environment Management Performance (PROPER) companies. This research has never been conducted before. Moving from the consideration above, we address four research questions:

*RQ1: Does the type of industry have a positive effect on environmental performance?*

*RQ2: Does the audit committee have a positive effect on environmental performance?*

*RQ3: How is firm size able to moderate the relationship between the industry type and environmental performance?*

*RQ4: How is firm size able to moderate the relationship between the audit committee and environmental performance?*

The structure of the research is as follows. Section 1 provides the introduction of the phenomena gap and research gap. In Section 2, the literature is reviewed and hypotheses are developed. Section 3 analyses the methodology including the sample, variable measurement, and data analysis. Section 4 presents the results of the data analysis. Section 5 discusses the research results. Section 6 concludes this paper.

## 2. LITERATURE REVIEW

Social contract theory reveals social relations in society to create harmony and balance including the environment. The social contract implicitly implies a mutual agreement (Jeet, 2022). On the one hand, legitimacy is given by the community for the existence of a firm. On the other hand, economic benefits must be provided by a firm to the community (Prayogo, 2011). Therefore, the firm and society are reciprocal or influence each other. A social contract is needed to protect each party's interests for a balance to occur between the two.

Good environmental performance can indicate that the firm has carried out its responsibility to fulfil its social contract with the community. Then the community will give trust and legitimacy to the firm so that a balance can be achieved. Hence, the audit committee has a consequence to make sure that the company can reach society's expectations. The social contract theory believes that companies should show their power to society.

The stakeholder theory believes the firm is an entity that must fulfil not only its interests but the interests of all its stakeholders (Dewi & Wirasedana, 2017). Firm stakeholders include employees, managers, suppliers, creditors, the government, and the entire community around the firm (Hidayah, Wahyunigrum, Nofriyanti, Kiswanto, & Pamungkas, 2020). One form of fulfilling the community's interests is the firm's care and protection of the environment. The environment is where the community lives, so it has an important role. People have hope for a sense of security and comfort so the environment must be preserved. Therefore, the firm's operational activities should not pollute or damage the environment but instead have a good impact. In line with the natural-resource-based theory that firm should actively harmonize their relationship with the environment (Rehman, Kraus, Shah, Khanin, & Mahto, 2021), hence, the firm needs a unit to control everything to run properly. The existence of an audit committee could encourage environmental performance.

In addition, the type of industry could give any impact on company performance. The low-profile company tends to have low environmental performance. Then, the high-profile company tends to have higher environmental performance. This condition is suitable with the stakeholder theory. The stakeholder will give more attention to companies that have high activities like manufacturing companies, mining companies, and so on. On the other hand, the public does not pay much attention to the behaviour of low-profile companies. This is because the activities of low-profile companies are not conspicuous to environmental damage. Hence, the company will be able to improve the efficiency of its performance if it is able to balance the needs of stakeholders (Hassouna & Salem, 2021).

### **2.1. The type of industry and environmental performance**

The size of the firm can influence environmental performance. Firm size determines the extent of the company's environmental scanning (Aldehayyat, 2015). Moreover, large companies have a greater responsibility for environmental sustainability. Hence, this study uses firm size as a moderating variable. The larger the size of the company, the greater the resources to finance environmental performance improvements. Big companies also tend to get more public attention so they will put in more effort to maintain their good image. This will motivate the company to have a good environmental performance. Large-size companies tend to have more complex operating activities that will have an impact on the environment. Therefore, the wider scope of audit committee review is able to improve

environmental performance. The more problems are found, the audit committee holds more frequent meetings to follow up on these problems so that they are immediately resolved and prevent the impact from spreading further. Therefore, firm size is thought to moderate the effect of the industry type and the audit committee activity on environmental performance.

The type of industry shows the level of sensitivity of the operational process in a company that gives an impact on society and the environment. The type of company industry is divided into two namely, high-profile industry and low-profile industry (Sari, 2012). High-profile companies are more easily highlighted by the public if they make mistakes and fail in their operations. In contrast to small companies, which receive less attention because the community considers that the environmental impact caused is not too significant. This is because the public is aware that the activities of high-profile companies have a higher risk of having a negative impact on the environment. More attention from the public encourages the company to maintain and continue to strive to create a good image. Public attention will also encourage companies to have better environmental performance (Cheng & Liu, 2018). Social responsibility shows the company's awareness that it wants to provide benefits to the community in return for the recognition it gives to the company. This reciprocal relationship is in accordance with the social contract theory which states that the social contract implicitly implies a mutual agreement where on the one hand, legitimacy is given by the community for the existence of a company, and on the other hand economic benefits must be provided by a company to the community (Prayogo, 2011).

In addition, compared to low-profile companies, high-profile companies have operating activities that are more closely related to nature or the environment. Therefore, high-profile companies feel they have a higher responsibility to contribute to environmental management because their industrial activities have a greater risk of causing environmental pollution, so high-profile companies are encouraged to improve their environmental performance, especially, if the company is a large company that, of course, has more complex operating activities. Large companies strive to achieve high production targets to meet market needs. The company's operating activities generate residues in the form of waste. The production of polluting companies is considered a serious problem affecting the environment (Chen, Wang, Albitar, & Huang, 2021). The higher the operating activity, the more waste will be generated. Large companies pay high attention to the social and environmental impacts of their operating activities because these have an important effect on their image (Tania & Herawaty, 2019). Larger companies are able to provide more resources to support the company's social and environmental policies (Crisóstomo et al., 2019). The capability shown by the available resources supports the company to implement corporate social responsibility (CSR) programs to improve its environmental performance.

*H1: The type of industry has a positive effect on environmental performance.*

## **2.2. The audit committee and environmental performance**

The activities of the audit committee related to its duties and responsibilities as a committee is formed by the board of commissioners who assists it in carrying out its functions. The duties and responsibilities of the audit committee include reviewing financial information that will be issued by the company to the public or other parties in the form of financial reports, projection reports, and other reports related to the company's financial information; conducting a review of compliance with laws and regulations and so on (Otoritas Jasa Keuangan Republik Indonesia, 2015). In addition, based on social contract theory, it is argued that a company should care about the environment to show the importance of the company's presence in the community. The top management has a direct impact on environmental performance (Haldorai et al., 2022). Hence, the audit committee has a vital role to make sure that everything runs well to achieve higher environmental performance.

The audit committee works independently without taking sides with any party. There is no interest that is more priority than the objectives of the company. This principle helps the company to position itself as an entity that must provide benefits to all its stakeholders. Company stakeholders include employees, managers, suppliers, creditors, government, and the community (Hidayah et al., 2020).

According to stakeholder theory, companies have to pay attention to stakeholders' interests. Therefore, the audit committee helps fulfil the balanced interests of the company and the stakeholder. The company wants legitimacy and trust from the community, while the community wants contributions or social benefits from the company. The balanced reciprocal relationship between the two is in accordance with the social contract theory. The audit committee has to review the compliance of the company's activities with environmental regulations and review risk management activities. If the audit committee finds violations of the law and it will give a negative impact on society and the environment, the audit committee can discuss the solution at the audit committee meeting. The audit committee meeting frequency has a substantial role in company performance (Al-Matari, 2022). In addition, meetings are held to discuss and decide policies related to environmental issues (Chariri et al., 2017). The meeting will decide on a solution to the problems that occur. The parties present at the meeting can also discuss breakthroughs to prevent the problem from recurring or some measures to prevent other problems that may occur.

*H2: The audit committee has a positive effect on environmental performance.*

## **2.3. Firm size moderates the relationship between the type of industry and environmental performance**

Company size is one of the benchmarks for the success of a company. The larger size of a company will encourage a positive relationship between the type of industry and environmental performance. Industries with high-profile types and supported by large-size companies have a good effect on environmental performance. High-profile companies will be more concerned with

the surrounding environmental conditions. The ability of large resources will cover the needs of environmental conservation. Moreover, today's socio-economic life has changed and companies must really pay attention to the surrounding conditions (AlHares, Abu-Asi, Dominic, & Al Abed, 2021). The existence of large company resources will be used in the interests of stakeholders by improving environmental performance (Sari & Ulupui, 2013).

Based on stakeholder theory, stakeholders need information about the company. Therefore, the company must establish good communication with all stakeholders. These stakeholders include internal stakeholders and external stakeholders like government, suppliers, consumers, so on (Crifo & Rebérioux, 2016). The company must be able to achieve the organizational goals that have been targeted. In addition, the company must also be able to meet community expectations such as environmental sustainability around the company and improving the welfare of the community around the company's area. From the government side, companies must be able to comply with government regulations and pay taxes to the government. Hence, the existence of large assets owned by high-profile companies will be able to encourage the achievement of maximum environmental performance.

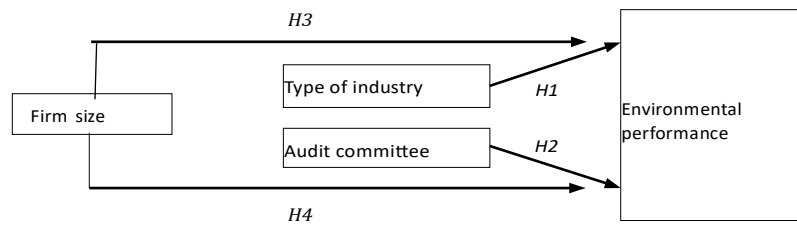
*H3: Firm size moderates the relationship between the type of industry and environmental performance.*

## **2.4. Firm size moderates the relationship between the audit committee and environmental performance**

Company size is an important factor in a business process. The size of the company will determine the company's position in the eyes of national and international. Therefore, the larger size of the company will be able to provide more facilities for the audit committee to conduct various kinds of training and increase its competitiveness. In addition, the size of the company will encourage the audit committee to be more focused and more integrated into the company's activities, especially in terms of environmental performance. Human resources who understand environmental performance are urgent for the company (Ahmad et al., 2021). This is because the current environmental performance has become one of the important factors. In addition, the rise of innovation in organizational management has encouraged companies to implement strategic sustainability behaviour (Rodríguez-Espindola et al., 2022). This condition requires the audit committee to be able to monitor the implementation of strategic sustainability behaviour in the company's operational processes. The role of the audit committee in big companies is very important. According to social contract theory, the bigger companies should show the public their ability to control the operation of the company. Moreover, the companies need recognition from society. Hence, the audit committee in bigger companies will be more powerful to control the achievement of environmental performance. The larger the size of the company, the audit committee will meet more often to ensure maximum environmental performance.

*H4: Firm size moderates the relationship between the audit committee and environmental performance.*

**Figure 1. Research model**



### 3. RESEARCH METHODOLOGY

#### 3.1. Sample selection

The research population is companies listed on the Indonesia Stock Exchange and participated in PROPER in 2017–2019. The total population is 75 companies. The sampling technique used purposive sampling, which means the sample was selected based on specific criteria (see Table 1). The company sample is 66 companies. Since the researchers used three years of data then the total unit of analysis is 198 units. This study uses a deductive approach with a quantitative method. Data sources from annual reports and sustainability reports from companies. The researchers also conducted a literature study through several pieces of literature such as books, articles, laws, and other sources.

#### 3.2. Measurement of the variables

This study has independent variables, dependent variables, and moderating variables. The dependent variable is *environmental performance*. The independent variables are *type of industry* and *audit committee*. Furthermore, the moderating variable is *firm size*. The measurement of environmental performance used firms rank PROPER. Then the measurement of *type of industry* used a dummy variable (1 for high-profile and 0 for low-profile). *Audit committee* is measured by the number of meetings during a year. Finally, *firm size* used Ln of total assets (see Table 2).

**Table 1. Sample selection criteria**

No.	Criteria	Amount
1	The firm is listed on the Indonesia Stock Exchange and participates in PROPER 2017–2019	75
2	The firm does not issue financial statements for 2017–2019	5
3	The firm's financial statements do not have the complete data needed for the research	4
Research sample firms		66
A number of units of analysis (a number of research sample firms x 3 years)		198

**Table 2. Variable operational definition**

Variable	Definition	Measurement
<i>Environmental performance</i>	Environmental performance is the firm's performance in creating a suitable environment (Suratno, Darsono, & Mutmainah, 2007).	Firms rank in PROPER: 5 (gold), 4 (green), 3 (blue), 2 (red), 1 (black) (Chariri et al., 2017)
<i>Type of industry</i>	The type of industry is related to the level of sensitivity of the firm to produce a negative impact on its activities on the environment (Chariri et al., 2017).	Industry type = 0 (low-profile firm) 1 (high-profile firm) (Sari, 2012)
<i>Audit committee</i>	Activities in the form of meetings and audit meetings can discuss and converse about policies related to environmental issues (Chariri et al., 2017).	Audit committee activity: t = number of meetings in one year (Chariri et al., 2017).
<i>Firm size</i>	Classification of the size of a firm (Kustina, 2020).	Firm size = Ln total assets (Harsono, Handoko, & Fransisca, 2012)

#### 3.3. Model specifications

The data analysis used descriptive analysis and ordinal regression, then moderating regression analysis (MRA). This study uses ordinal regression because the dependent variable, namely

*environmental performance*, has categorical data, which is worth 1, 2, 3, 4, or 5. Before testing the hypotheses, a regression model feasibility test and a test to assess the model fit are carried out. The research model formed is below:

$$KNL = \alpha + \beta_1 ZTPI + \beta_2 ZAKA + \beta_3 ZUKP + \beta_4 |ZTPI - ZUKP| + \beta_5 |ZAKA - ZUKP| + s \quad (1)$$



where,  
*KNL*: environmental performance;  
 $\alpha$ : regression constant;  
 $\beta_i$ : a regression coefficient, where  $i = 1, 2, 3...$   
(independent variable);  
*ZTPI*: Z-score of type of industry;  
*ZAKA*: Z-score from audit committee meeting;

*ZUKP*: Z-score of firm size;  
 $|ZTPI - ZUKP|$ : an absolute value of Z-score *TPI* — Z-score size;  
 $|ZAKA - ZUKP|$ : an absolute value of Z-score *AKA* — Z-score size;  
*s*: error.

#### 4. RESULTS

Descriptive statistical analysis shows a description of the profile of each variable. For environmental performance, most of them have relatively good environmental performance, as indicated by a Blue rating of 74.7% and a Green rating of 13.6% of the total (see Table 3).

**Table 3.** Descriptive statistics of environmental performance

		<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
Valid	2.00	18	9.1	9.1	9.1
	3.00	148	74.7	74.7	83.8
	4.00	27	13.6	13.6	97.5
	5.00	5	2.5	2.5	100.0
	Total	198	100.0	100.0	

Table 4 shows most of the firms are high-profile firms with high sensitivity to the environment. Hence, the larger firms, the higher their responsibility to the environment.

**Table 4.** Descriptive statistics of the type of industry

		<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
Valid	0.00	27	13.6	13.6	13.6
	1.00	171	86.4	86.4	100.0
	Total	198	100.0	100.0	

Table 5 shows the maximum number of meetings for the audit committee is 45 times. Then, the minimum number is one time which happened in PT Trisula Textile Industries Tbk in 2017. In 2018 and 2019, the maximum number of meetings was held by PT Semen Indonesia (Persero) Tbk. In conclusion, the average number of audit committee meetings is four times a year.

**Table 5.** Descriptive statistics of the audit committee activity

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Dev.</i>
AKA	198	1.00	45.00	8.5051	8.89233
Valid N (listwise)	198				

Table 6 shows the minimum value of firm size was owned by PT Mustika Ratu Tbk in 2017, while

the maximum value was owned by PT Indah Kiat Pulp & Paper Tbk in 2018. The standard deviation is smaller than the average value, meaning that the data has an even distribution.

**Table 6.** Descriptive statistics of firm size

	N	Minimum	Maximum	Mean	Std. Dev.
UKP	198	13.12	18.66	15.7650	1.49333
Valid N (listwise)	198				

Table 7 shows the final value of overall model fit test results is less than the intercept-only value, or there is a decrease in the value of -2 log-likelihood. A significance value less than 0.05 indicates that the model is considered fit. It is mean that the model becomes better with the addition of independent variables into the regression model and this research model is fit. In addition, Table 8 shows the significance value of Pearson and Deviance is more than 0.1 so the model is fit. Hence, the regression model is feasible to be used in further analysis.

**Table 7.** Overall model fit test results

Model	-2 log-likelihood	Chi-square	df	Sig.
Intercept only	316,856			
Final	266,825	50.031	5	0.000

**Table 8.** The results of the regression model feasibility test (goodness of fit test)

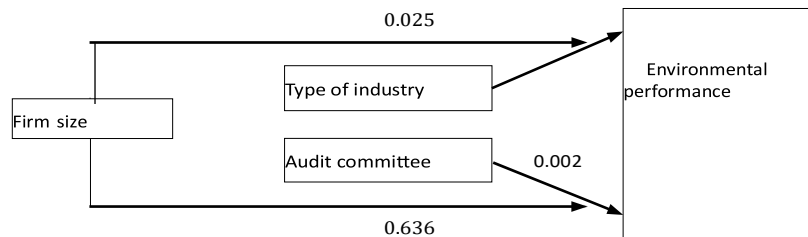
	Chi-square	df	Sig.
Pearson	438,129	586	1.000
Deviance	266,825	586	1.000

The regression shows that *H1* is accepted because the significance value is 0.017 which is lower than 0.05. Then *H2* is accepted because the significance value is 0.002 which is lower than 0.05. Therefore, the audit committee has a positive effect on environmental performance. In addition, the value of significance is 0.025 which is lower than 0.05, so *H3* is accepted. Hence, firm size can moderate the relationship between the type of industry and environmental performance. However, *H4* is rejected because the significance level is more than 0.05.

**Table 9.** Hypotheses test results

Hypotheses	Coef.	Sig.
<i>H1: The type of industry has a positive effect on environmental performance.</i>	0.275	0.017
<i>H2: The audit committee has a positive effect on environmental performance.</i>	0.366	0.002
<i>H3: Firm size moderates the effect of the industry type on environmental performance.</i>	0.391	0.025
<i>H4: Firm size moderates the effect of the audit committee activities on environmental performance.</i>	0.084	0.636

**Figure 2.** Result



## 5. DISCUSSION

The result of regression shows the type of industry proved to have a positive effect on environmental performance. This result is in line with the stakeholder theory, where in addition to fulfilling its interests; the firm must fulfil the interests of the community, in this case, the interests of feeling safe and comfortable living in a sustainable environment. The type of industry shows the level of sensitivity of the firm in producing negative impacts on the environment. This sensitivity classifies firms into two types namely, high profile and low profile. High-profile firms are more sensitive, so they are easier to spot. Therefore, high-profile firms constantly strive to create and maintain a good image through good environmental performance. Public attention will encourage firms to have better environmental performance (Cheng & Liu, 2018). The environmental aspect has a significant effect on the firm's image to build a positive firm's image, and this environmental aspect is crucial to pay attention to (Juri & Sailawati, 2020). The industry is an essential factor in influencing environmental performance based on how sensitive the firm responds to environmental issues (Chariri et al., 2019). High-profile firms feel they have a higher responsibility to contribute to environmental management because the impact on the environment tends to be greater than low-profile firms. High-profile firms have higher environmental performance than low-profile firms (Rachman, 2013). Firms with high sensitivity to the environment have environmental performance following applicable laws and regulations (Yesika & Chariri, 2013). The more sensitive the firm, the better its environmental performance. The results of this study are in line with the other research results that the type of industry positively impacts environmental performance (Chariri et al., 2017; Chariri et al., 2019; Garcia et al., 2017; Crisóstomo et al., 2019; Yesika & Chariri, 2013; Paramita & Chariri, 2013).

Subsequent evidence is that the audit committee activities proved to affect environmental performance in a positive direction. The audit committee activities are related to implementing their duties and responsibilities that uphold independence so that each action does not favour one group, in line with the stakeholder theory and social contract theory. The duties and responsibilities of the audit committee closely related to the environment are to review the compliance of the firm activities with the laws and regulations and review risk management activities if there is no risk monitoring function under the board of commissioners. The audit committee is responsible for monitoring risk management policies, including the risk of firm activities that can cause negative impacts on the environment (Chariri et al., 2017). The audit committee has an essential role in overseeing firm policies related to environmental issues (Trotman & Trotman, 2015). The results of the study were discussed through the audit committee meeting to discuss the next steps. From the meeting, a decision was made on a solution to overcome the problems found. The readiness of the audit committee in dealing with problems also affects environmental

performance. When the audit committee finds risk management activities that are not working correctly, the audit committee can communicate the findings to the parties involved. The results of these communications are discussed through audit committee meetings as material for evaluation and finding solutions. This will maximize risk management activities to minimize the negative impact of the firm's operations on the environment. The higher the frequency of audit committee meetings, the better the firm's environmental performance. These results are in line with the results of the research by Chariri et al. (2017) and Wijayanti (2016).

Firm size is proven to moderate the influence of the industry type on environmental performance seen from the significance value obtained of 0.025 less than 5%. Following the stakeholder theory and social contract theory, the firm fulfils the interests of all stakeholders, including society and the environment. High-profile firms with high sensitivity tend to minimize the environmental impact, especially if they are large firms with sufficient resources to finance it. Resources are essential and needed to realize programmes that aim to improve the firm's environmental performance. Larger firms can provide more resources to support corporate social and environmental policies (Crisóstomo et al., 2019). Large firms tend to finance efforts to improve environmental performance and have better environmental investment policies (Tiurmali et al., 2018). In addition, large firms have more complex operating activities. Large firms strive to achieve production targets to meet market needs. The production of polluting firms is considered a severe problem affecting the environment (Chen et al., 2021). The higher the operating activity, the more waste/pollution will be generated. People will be more and more worried about the increasing intensity of waste and the risk of harming the environment if it is not appropriately managed. Firms are encouraged to make more efforts in overcoming this problem. Large firms pay great attention to social and environmental impacts due to their operating activities because these have an important impact on their image (Tania & Herawaty, 2019). High public demands for environmental protection encourage companies to innovate and improve their performance to ensure their legitimacy (Cheng & Liu, 2018). The implementation of good environmental management has a big impact on improving the company's good image (Sari & Ulupui, 2013). Moreover, good environmental performance can avoid management scandals (AlHares et al., 2021). Companies with large total assets have more funds to invest in technology and sound environmental management. This encourages companies to have good environmental performance and motivates them to disclose information in order to maintain the company's reputation (Yusnita, 2010). High sensitivity supported by adequate resources and motivation to maintain a good image encourages firms to improve their environmental performance.

On the other hand, firm size proved unable to moderate the effect of audit committee activities on environmental performance seen from the significance value obtained at 0.636 more than 5%. This result is contrary to the stakeholder theory

and social contract theory, where the more significant the firm, the more it will try to continuously improve its performance. Moreover, the firm wants to gain legitimacy and a good image and then meet the growing demands of society. This study failed to prove the influence of firm size, which was considered capable of moderating the effect of audit committee activities on environmental performance. Firm size did not affect the frequency of audit committee meetings held by a firm. This condition is due to the awareness of audit committees, whether a big firm or small, they have a strict job description that must be done. The data of this study support this estimate. Large firms such as PT Indah Kiat Pulp & Paper Tbk and PT United Tractors Tbk hold audit committee meetings four times a year and receive a Blue rating in PROPER. Meanwhile, small firms such as PT Trisula Textile Industries Tbk, PT Prasadha Aneka Niaga Tbk, and PT Tirta Mahakam Resource Tbk also hold audit committee meetings four times a year and get the same rating namely, the Blue rating in PROPER. Large firms that are considered to have a broader scope do not guarantee a high frequency of audit committee meetings. On the other hand, small firms do not necessarily have a low frequency of audit committee meetings because the minimum number of meetings is already regulated by government policy.

## 6. CONCLUSION

In this research, we emphasized the role of firm size on environmental performance in Indonesia. The type of industry and the audit committee have a significant positive effect on environmental performance. According to the social contract theory, the type of industry, especially high-profile companies will try their best to show their presence in the community. One way is to achieve maximum environmental performance. The company demonstrates its legality and power to be recognized by the public and the government. Hence, the company has a bargaining position for the sustainability of its business.

The audit committee has an effect on the achievement of the company's environmental

performance. The high and low effectiveness of audit performance has an impact on company performance, especially environmental performance. The role of the audit committee is the main key in monitoring all company activities that are in harmony with the environmental balance. Hence, the companies should improve audit committee effectiveness to reach higher environmental performance.

Going into depth, firm size can moderate the effect of the industry type on environmental performance. The bigger size of the asset in high-profile companies will lead to higher environmental performance. The availability of abundant resources, especially in the asset sector, has been able to encourage companies to maximize environmentally conscious behaviour. Hence, firms that have large sizes must improve environmental performance to maintain the firm's sustainability.

On the other hand, firm size cannot moderate the effect of audit committee activities on environmental performance. The audit committee is not affected by the size of the company in ensuring the achievement of the company's environmental performance. The audit committee works under the audit committee charter. In addition, the audit committee is also bound by a code of ethics, whatever the condition of the company will not affect its independence and professionalism in carrying out its duties and functions.

This paper contributes to the company's management practices, especially to maintain a position as a high-profile company for better environmental performance. In addition, the companies should improve the effectiveness of the audit committee to realize maximum environmental performance. Last, but not least, the government should make strict policies related to environmental sustainability to avoid severe natural damage. This research limitation is only covered PROPER firms so it could not be generalized to all companies. Further research should use companies from many sectors and use firm size as an intervening variable to determine the extent of the role of firm size on environmental performance comprehensively.

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Lecturer of Accounting Department  
Faculty of Economics,  
Universitas Negeri Semarang



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Senior Managing Editor, Managing Editor of the journals "Corporate Ownership and Control", "Journal of Governance and Regulation", "Risk Governance and Control", "Financial Markets & Institutions", and "Corporate & Business Strategy Review"  
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We are delighted that a successful collaboration has been established and we are looking forward to new scientific cooperation.

Best regards,  
Olha

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**Olha Lytvynenko**

Senior Managing Editor, Managing Editor of the journals "Corporate Ownership and Control", "Journal of Governance and Regulation", "Risk Governance and Control: Financial Markets & Institutions", and "Corporate & Business Strategy Review"

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*Corporate & Business Strategy Review / Volume 3, Issue 1, 2022*

# THE ROLE OF FIRM SIZE ON ENVIRONMENTAL PERFORMANCE IN THE DEVELOPING COUNTRY

Retnoningrum Hidayah<sup>\*</sup>, Dhini Suryandari<sup>\*\*</sup>, Trisni Suryarini<sup>\*\*</sup>,  
Sukirman<sup>\*\*</sup>, Ima Nur Kayati<sup>\*\*</sup>, Rahayu Dinassari<sup>\*\*</sup>,  
Fian Tri Rohmah<sup>\*\*</sup>

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## Abstract

**How to cite this paper:** Hidayah, R., Suryandari, D., Suryarini, T., Suldman, Kaya, I. N., Dinassari, R., & Rohmah, F. T. (2022). The role of firm size on environmental performance in the developing country. *Corporate & Business Strategy Review*, 3(1), 134-143. <https://doi.org/10.22495/cbsrv3i1art12>

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The balance between economic development and environmental performance is very important for human life (Zhang, Geng, & Wei, 2022; Haldorai, Kim, & Garcia, 2022). This study aims to examine the role of firm size on the relationship between the type of industry and the audit committee on environmental performance. The sample consisted of 198 units of analysis. The method used descriptive analysis and ordinal regression analysis with an absolute difference value test for moderation. The results show the type of industry and the audit committee positively affect environmental performance. In addition, firm size could moderate the relationship between the type of industry and environmental performance. However, firm size failed to moderate the relationship between the audit committee and environmental performance. This research limitation is only covered the Rating Program in Environment Management Performance (PROPER) firms. This research is the first model to investigate the role of firm size on the relationship between the type of industry, the audit committee, and environmental performance. This paper gives more knowledge for government to make strict policies related to the environmental problem to avoid severe natural damage in Southeast Asia, especially in Indonesia. This study contributes to the literature on company's management practices. A firm should encourage the audit committee's effectiveness and improve the asset to achieve better environmental performance.

**Keywords:** Audit Committee, Environmental Performance, Firm Size, Type of Industry

**Authors' individual contribution:** Conceptualization — R.H.; Methodology — D.S.; Software — R.D.; Validation — F.T.R. and I.N.K.; Formal Analysis — T.S.; Investigation — R.H.; Resources — S.; Data Curation — F.T.R.; Writing — Original Draft — R.H.; Writing — Review & Editing — D.S.; Visualization — T.S.; Supervision — S.; Project Administration — I.N.K., R.D., and F.T.R.

**Declaration of conflicting interests:** The Authors declare that there is no conflict of interest.

## 1. INTRODUCTION

The increasing need for life requires humans to continue to carry out consumption activities. As a party that fulfils the markets, the firm takes

this opportunity to obtain maximum profit. However, to achieve this, firms sometimes ignore the environmental impacts arising from their operations. The environmental effects can be in the form of environmental pollution or

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hope this email finds you well.

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I would appreciate very much if you could write 5-7 sentences concerning your point of view of cooperation with us (communications with the managing editor of the journal, reviewing process, the content of the reviewer's report). This info will be collected on our website as some kind of annual transparency policy of the Publisher: <https://virtusinterpress.org/Feedback-from-stakeholders-6226.html>

Hope to hear from you soon. Thank you!

Kind regards,

Olha



**Olha Lytvynenko**

Senior Managing Editor, Managing Editor of the journals "Corporate Ownership and Control", "Corporate Board: Role, Duties and Composition", "Journal of Governance and Regulation" and "Risk Governance and Control: Financial Markets & Institutions"

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15 Agustus 2022 pukul  
21.43

Kepada: Retnoningrum Hidayah <retnoningrum.hidayah@mail.unnes.ac.id>

Dear Retnoningrum Hidayah,

hope this email finds you well.

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I would appreciate very much if you could write 5-7 sentences concerning your point of view of cooperation with us (communications with the managing editor of the journal, reviewing process, the content of the reviewer's report). This info will be collected on our website as some kind of annual transparency policy of the Publisher: <https://virtusinterpress.org/Feedback-from-stakeholders-6226.html>

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