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The Effect of Financial Constraints and Corporate Governance on Environmental Performance

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Abstract: This study investigates the impact of financial constraints and corporate governance on a company's environmental performance. The independent variables used in this study are financial constraints, managerial ownership, institutional ownership, and audit committees. The dependent variable in this study is environmental performance. Additionally, it controls for variables such as company size and profitability. This study uses a sample of 185 data points from mining sector companies listed on the Indonesia Stock Exchange (IDX) during the 2021-2023 period. By using a quantitative approach in the form of panel data regression as a data analysis method, it shows that financial constraints, managerial ownership, and audit committees have a positive effect on environmental performance. While institutional ownership hurts environmental performance. The integration of financial constraints and corporate governance as comprehensive determinants of environmental performance is still rarely explored together in the Indonesian context, especially in the mining sector, which has a significant environmental impact. This study is expected to contribute to the understanding of financial constraints, corporate governance, company size, and profitability regarding how these factors interact to influence environmental performance. In addition, this study is also expected to be a reference for further research on financial constraints, corporate governance, environmental performance, company size, and profitability. This research not only makes academic contributions but also has significant practical implications for companies, stakeholders, and policymakers in improving environmental performance.

Keywords: Corporate Governance, Environmental Performance, Financial Constraints

A. Introduction

Public awareness of environmental issues is currently increasing due to the impact of climate change, pollution, and ecosystem damage. One of the things that is also a concern for the public regarding the environment is how a company impacts the environment around it. Companies that usually only aim to achieve the desired profit

are now required to be responsible for the environment. Especially in mining sector companies that tend to have an impact on the environment, for example, if mining companies use surface methods using explosives and heavy machinery, which cause deforestation and air pollution. Based on data from the Ministry of Environment and Forestry, Indonesia is experiencing deforestation instability.

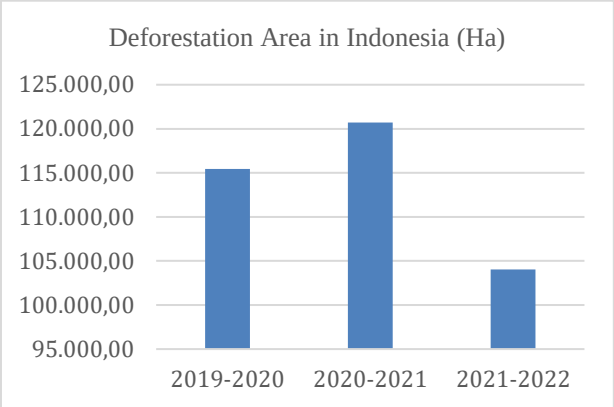


Figure 1. Deforestation Area in Indonesia from 2019 to 2022
Source: https://www.bps.go.id

Data shows that the rate of deforestation in Indonesia is increasing, decreasing, increasing, and the possibility that the rate of deforestation will also increase in the following year. This is certainly a condition that needs to be considered. Companies are one of the causes of environmental damage. The emergence of various environmental consequences from the company's operations requires companies to pay more attention to the environmental conditions around them. However, in the company's efforts to adopt environmentally friendly business practices, they are often faced with various obstacles.

One of the obstacles experienced is financial constraints. Financial constraints, or what are commonly referred to as financial constraints, are a situation where there are obstacles to the money market and result in higher external financing compared to internal costs, so that the company experiences financial constraints (Fazzari & Athey, 1987). Financial constraints are experienced by companies when the company has difficulty funding the purpose of development and growth of the company as desired (Zhang & Liu, 2022). This is, of course, the main obstacle when companies want to adopt environmentally friendly practices.

If a company has a goal of preserving the environment well, the first thing to do is to have good corporate governance as well (Budi Untung, 2014). Corporate governance is very important in the balance of the company because it provides direction and control for the company so that its performance improves well. In this case, good corporate governance has an important role in dealing with environmental issues. If

corporate governance is effective, the company's environmental performance will improve (Suharyati, 2015).

As a form of government concern for the environment, the government, through the Ministry of Environment and Forestry, issued regulations regarding the implementation of the Corporate Performance Rating and Environmental Management Program, or PROPER, in 2002. PROPER is an implementation of government support for companies to be more concerned about the environment. PROPER is implemented by categorizing several color groups that can make it easier for the public to assess the company. The color indicators used are gold (companies that consistently highlight their environmental excellence), green (companies that have exceeded regulatory requirements), blue (companies that meet environmental management efforts according to requirements), red (companies that have not met regulations and are in the stage of implementing administrative sanctions), and black (companies intentionally or negligently causing environmental damage).

There are several previous studies that show inconsistencies regarding financial constraints on environmental performance, such as research by Chen et al. (2022), which shows a significant positive relationship between financial constraints and environmental performance. However, research by Deng et al., (2022), Tian & Lin (2019a), and Liao et al. (2021) shows a negative influence. In addition, in corporate governance, several studies also show different results, such as research by Tania & Herawaty (2019) on manufacturing companies in the 2014-2018 period, which found that independent commissioners and the company's audit committee did not have a significant effect on environmental performance. The results of this study are certainly not in line with agency theory and differ from the results of research by Chakraborty & Werner (2018) and Yang et al., (2018) which found that managerial ownership has a positive effect on environmental performance, research by Luo et al. (2019) and Ardyan et al. (2020) which prove that independent commissioners have a positive effect on environmental performance, and research by Purbopangestu (2014) and Yu et al. (2020) which found that audit committees affect on environmental performance.

This study presents a novelty by proposing a comprehensive framework by integrates financial constraints and corporate governance to then examine their effects on environmental performance in mining sector companies in Indonesia in 2021-2023. In addition, company size and profitability are used as control variables to achieve more comprehensive analysis results. This study is expected to contribute to knowledge about financial constraints, governance, company size, and profitability, interacting with each other to influence environmental performance. In addition, it is hoped that this study can be a reference for future studies on financial constraints, governance, company size, and profitability. In response to the background of the problem, a problem formulation arises, namely whether financial constraints and corporate governance in the form of managerial ownership, independent commissioners, and

audit committees will affect the environmental performance of mining companies listed on the Indonesia Stock Exchange.

Pecking Order Theory, According to Myers (1984), companies will determine the use of capital based on priorities that often prioritize internal funding using retained earnings compared to external financing or issuing new shares. If the company must use external funding, the company will issue securities that use high levels of security. However, issuing shares is often considered a negative sign for stakeholders regarding the company's current condition and prospects Ding et al., (2013).

Stakeholder Theory, this theory in the book entitled Strategic Management: A Stakeholder Approach states that in making strategic decisions, companies must consider stakeholders (R. Edward Freeman, 1984). Stakeholders are individuals or groups who influence or are influenced by the achievement of organizational goals, so that managers must design and implement company activities that meet the interests of the various parties involved in the business (Sukindrawati et al., 2022).

Agency Theory, this explains the relationship between principals (owners) and agents (managers) in a company where there is often a conflict of interest between the two parties, who have different goals and information asymmetry (A. Y. Sari et al., 2022). This agency theory examines how principals can design incentive and monitoring systems to reduce the risk of agent behavior that is not in line with the principal's interests.

B. Methods

This study utilizes data from mining companies listed on the Indonesia Stock Exchange (IDX) from 2021 to 2023, collected from the companies' published annual reports. The company's annual reports are accessed through the Indonesia Stock Exchange website and the official website of each company. Researchers also use PROPER rating data from the Ministry of Environment and Forestry and historical data from various accessible sources. In addition, companies must also disclose information about corporate governance. After determining these criteria, 65 companies were found to meet the criteria. In conducting the test, Eviews 12 software was used. Table 1 explains all the variables used in the study, along with their formulas.

Table 1. Explanation of Variables

Acronym	Variable	Formula	Source
FC	Financial Constraints	$CF_{i,t} = \frac{Net\ profit\ i,t + Depreciation\ i,t}{Tangible\ fixed\ asset\ i,t}$ $CF_{i,t}$ = Cash flow of company i in the period ke - t	Fazzari (1987)
KM	Managerial Ownership	$KM = \frac{Number\ of\ shares\ owned\ managerial\ side}{Total\ shares\ outstanding}\ x\ 100\%$	Yesika & Chariri (2013)
KI	Independent Commissioner	$KI = \frac{Number\ of\ commissioners\ independent}{Number\ of\ members\ board\ of\ Commissioners}\ x\ 100\%$	Yesika & Chariri (2013)
KA	Audit Committee	$KA = \frac{Number\ of\ committee\ members\ external\ audit}{Total\ number\ of\ members\ audit\ committee}$	Ananta (2017)
Size	Company Size	LnTA = Ln (Total Assets)	Wulandari & Novitasari (2020)
ROA	Profitability	$ROA = \frac{Net\ profit\ after\ tax}{Total\ assets}\ x\ 100\%$	Sutrisno & Riduwan (2022)

Sources: (Fazzari, 1987; Yesika&Chariri, 2013; Ananta, 2017; Wulandari&Novitasari, 2020; Sutrisno&Riduwan, 2020)

Environmental performance assessment based on PROPER uses color indicators in the form of gold, green, blue, red, and black, which are given a score of 5,4,3,2,1 from companies that are more than compliant to companies that are not yet compliant with PROPER regulations.

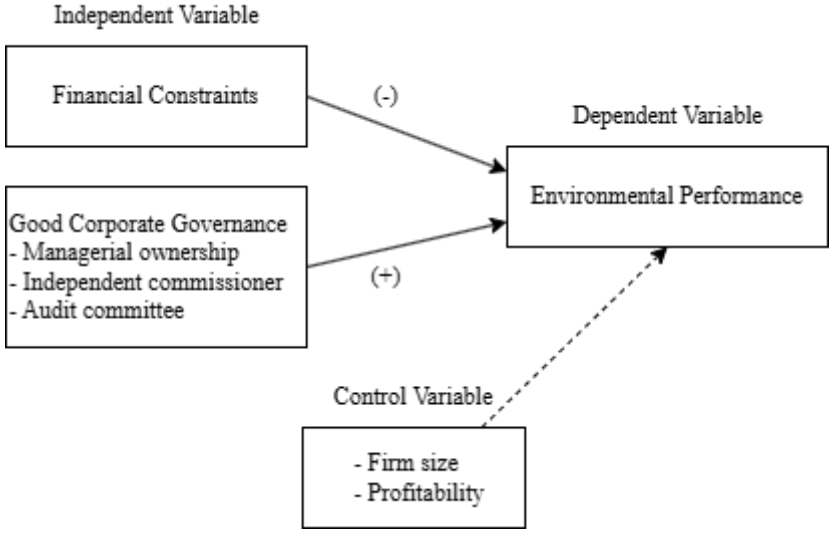
Financial constraints affect companies in adopting environmentally friendly practices. According to the pecking order theory, companies will choose internal funding rather than having to use external funding sources. However, financial constraints that occur will cause companies to reduce costs for environmental activities and prioritize activities with fast and large results. This, of course, has an impact on reducing funds for projects related to environmental performance. Based on research by Tian & Lin (2019a), Liao et al. (2021), and Deng et al., (2022) who found that financial constraints hurt environmental performance.

According to agency theory, corporate governance and environmental performance will be mutually beneficial because companies must consider various things, including environmental aspects. With the existence of managerial share ownership owned by company managers, it will unite the interests of managers with stakeholders who want the company to address environmental issues (Mehran, 2019). Research by Chakraborty & Werner (2018) and research by Yang et al., (2018) showed that managerial ownership will improve environmental practices.

In agency theory, independent commissioners are considered to be able to help reduce conflicts of interest. In the context of environmental performance, independent

commissioners can ensure that management will prioritize environmental interests and ensure that company policies comply with existing environmental standards. Previous research by Yesika & Chariri (2013), Luo et al. (2019), and Ardyan et al. (2020) also found that independent commissioners have a positive effect on environmental performance.

The audit committee, based on agency theory, is responsible for ensuring that the company complies with applicable laws and regulations, implements appropriate business ethics, and oversees the implementation of company operations to reduce conflicts of interest. In the context of environmental performance, the audit committee will evaluate the environmental risks that may occur due to the company and seek solutions related to this.
Based on the theoretical review above, the framework of thought can be summarized in Figure 1.



The test was carried out through several stages, including descriptive statistical analysis, normality test, multicollinearity test, heteroscedasticity test, autocorrelation test, Chow test, Hausman test, LM test, fixed model, random model, common model, t-test, F-test, determination coefficient test, and multiple regression analysis. The analysis was carried out with data from 65 mining sector companies listed on the IDX in 2021-2023. Therefore, the regression equation used to test the hypothesis includes:

$$Y = \alpha + \beta 1tFC + \beta 2tKM + \beta 3tKI + \beta 4tKA + \beta 5tLnTA + \beta 6tROA + \varepsilon \text{ (i)}$$

Description:
Y = Environmental Performance
FC = Financial Constraints
KM = Managerial Ownership
KI = Independent Commissioner

KA = Audit Committee
LnTA = Company Size
ROA = Profitability
α= Constant
β1t, β2t, β3t, β4t, β5t, β6t = Regression coefficient values
1,2,3,4,5,6 = Unit cross-section
t = unit data panel
ε (i), ε (ii) = Standard error

C. Results and Discussion

Table 2. Descriptive Statistical Analysis Results

	KL	T_FC	T_KM	T_KI	T_KA	T_SIZE	T_ROA
Mean	3.897297	0.250432	0.274919	0.449676	0.243243	26.46941	0.042757
Median	4.000000	-0.020000	0.030000	0.300000	0.090000	26.30000	-0.140000
Maximum	5.000000	14.03000	2.610000	2.370000	2.310000	34.11000	2.150000
Minimum	1.000000	-2.880000	-0.750000	-0.590000	-0.740000	21.51000	-0.990000
Std. Dev.	1.204720	1.392649	0.718078	0.730367	0.724577	1.821220	0.708604
Skewness	-1.148579	5.843115	1.261650	1.023438	1.060027	0.575123	1.084287
Kurtosis	3.560922	54.94754	4.055550	3.233878	3.418010	4.867279	3.568428
Jarque-Bera	43.10170	21854.01	57.66779	32.71724	35.99300	37.07552	38.74073
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	721.0000	46.33000	50.86000	83.19000	45.00000	4896.840	7.910000
Sum Sq. Dev.	267.0486	356.8626	94.87702	98.15218	96.60225	610.2992	92.39009
Observations	185	185	185	185	185	185	185

Descriptive statistical analysis shows the minimum, maximum, mean, and standard deviation values of the independent and dependent variables. Initially, data from 65 companies three-year period, totaling 195 companies, were used. However, after the normality test was carried out, it had not passed, so an outlier was identified by reducing the data so that after the outlier, 185 data points were obtained that had passed the normality test.

The average value of the KL (Environmental Performance) variable is 3.897 with a standard deviation of 1.204. The largest value of the KL (Environmental Performance) variable is 5 whiles, the smallest is 1. Based on the PROPER ranking by the Ministry of Environment, a company can be said to have complied with regulations regarding environmental performance if it gets a blue indicator with a score of 3. By the average value of the environmental performance variable which, shows the number 3.897, it can be interpreted that most mining sector companies in the 2021-2023 period that were used as samples have complied with regulations regarding environmental performance. The standard deviation value of 1.204 can be interpreted as level of data distribution for the environmental performance variable is 1.204.

Table 3. t-test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.789158	0.188087	4.195700	0.0001
T_FC	0.033928	0.009368	3.621555	0.0004
T_KM	0.869923	0.093766	9.277567	0.0000
T_KI	-1.226256	0.119050	-10.30034	0.0000
T_KA	0.377055	0.163103	2.311757	0.0225
T_SIZE	0.128385	0.007046	18.21979	0.0000
T_ROA	-1.826635	0.138398	-13.19842	0.0000

Based on the test results, financial constraints have a probability value of 0.000 smaller than α (0.05), then the regression coefficient is significant, and the coefficient value of 0.033928 indicates that the direction of the relationship is positive, and it is concluded that H1 is rejected. In the second hypothesis regarding managerial ownership, it shows a positive influence with a probability value of 0.000 smaller than α (0.05), then the regression coefficient is significant and the coefficient value is 0.869923, which indicates that H2 of this study is proven. Independent commissioners have a probability value of 0.000 smaller than α (0.05), then the regression coefficient is significant, and the coefficient value of -1.226256 indicates that the direction of the relationship is negative, so it is concluded that independent commissioners have a significant negative effect, so H3 is not proven.

The probability value of the audit committee variable is 0.022 smaller than α (0.05), then the regression coefficient is significant, and the coefficient value of 0.377055 indicates that the direction of the relationship is positive, so H4 is proven. The control variable in the form of company size produces a value of 0.000 smaller than α (0.05) and a coefficient value of 0.128385, which indicates that there is a significant positive influence. In addition, the control variable in the form of probability measured by ROA produces a value of 0.000 smaller than α (0.05) and a coefficient value of -1.826635, which indicates that there is a significant negative influence of ROA as a control variable.

The Effect of Financial Constraints on Environmental Performance

The initial hypothesis stated that financial constraints hurt on environmental performance. However, the results of the hypothesis test showed the opposite. This supports the argument that financial constraints can encourage companies to be more efficient in utilizing resources and finding better solutions for the future (Clarkson et al., 2011). This can make financial constraints a reduction in waste and trigger innovation so that it will later improve the company's environmental performance (Clarkson et al., 2011). This is in line with the research of Alam et al. (2019), Xie et al. (2019), Akbar et al. (2021), Liu et al. (2021), Zhang & Vigne (2021), Chen et al. (2022), Deng et al. (2022), Q.Xu & Kim (2022), Wang et al. (2022), Zhang & Lucey (2022),

Abbas et al. (2023), Nababan & Siregar (2023), Hao & Wu (2024), Rehman et al. (2024), Y.Xu & Zhu (2024), which found a significant positive effect of financial constraints on environmental performance.

The Influence of Managerial Leadership on Environmental Performance

The second hypothesis of this study states that managerial ownership has a positive effect on environmental performance. The results of the hypothesis testing indicate that this is in line. This finding is in accordance with stakeholder theory, which explains that companies must satisfy related parties, including paying attention to environmental aspects. Mehran (2019) states that managerial ownership is the number of shares owned by company management. With managerial ownership, companies can pay more attention to the environment because this can improve the company's reputation. This finding is in accordance with previous research by Adhi Saputra & Mahyuni (2018), Chakraborty & Werner (2018), G. A. C. N. Sari et al. (2018), Yang et al. (2018), Tania & Herawaty (2019), Tian & Lin (2019), Li et al. (2020), Francoeur et al. (2021), Lu & Wang (2021), Almashhadani et al. (2022), Appannan et al. (2022), Ullah et al. (2022), Sari & Purnomo (2023), Doan & Vu (2024), and Liem & Hien (2024), which shows that managerial ownership has a positive effect on environmental performance.

The Influence of Independent Commissioners on Environmental Performance

The third hypothesis is that independent commissioners have a positive influence on environmental performance. However, the results of the hypothesis test show that independent commissioners have a significant negative influence on environmental performance. This is because independent commissioners, who should be able to improve supervision but in their implementation encounter problems such as a lack of expertise, independent commissioners who pay less attention to environmental issues, and conflicts of interest that occur García-Sánchez et al (2017). Thus, the existence of independent commissioners who should support environmentally friendly practices can hinder the company's environmental performance such as the results of research by Walls et al. (2012), Ortiz-de-Mandojana et al. (2016), Parlupi (2017), Solikhah et al. (2021), Pratiwi et al. (2023), dan Moisello et al. (2024).

The Influence of the Audit Committee on Environmental Performance

The fourth hypothesis states that the audit committee has a positive influence on environmental performance. The results of the hypothesis test support this hypothesis. In line with agency theory, which states that the audit committee can improve the quality of supervision and company compliance with policies, rules, and laws related to the environment (Purbopangestu, 2014). This finding is in line with research by Chariri et al. (2017), Biswas et al. (2018), Adegboye et al. (2020), Arif et al.

(2020), Lu & Wang (2021), Z. Li et al. (2022), Paolone et al. (2022), Tumwebaze et al. (2022), Villiers et al. (2022), Yahaya, (2024), Karim et al. (2024), Gong et al. (2025), Hidayah & Ratmono (2025), Mahsina et al. (2025), Seth & Saxena (2025), which shows that the audit committee has a significant positive effect on environmental performance.

Control Variables

Company size and profitability are used as control variables with the aim of increasing the reliability and accuracy of the analysis carried out. By using total assets because it reflects that large companies usually have more resources invested, including environmental aspects. This is by research findings that show that company size has a significant positive effect on environmental performance, as in research by (Clarkson et al., 2011; Trumpp & Guenther, 2017). Profitability measured by ROA shows significant negative results on environmental performance. These results indicate that companies with higher profitability tend to pay less attention to environmental aspects because they focus more on financial aspects (Earnhart & Lizal, 2007).

Similar research examining the influence of financial constraints on environmental performance was conducted by Tian & Lin (2019) who conducted research in China in 2011-2013 found that small financial constraints do not damage the company's environmental performance, but if the financial constraints that occur are large, it will result in damage to the company's environmental performance with high investment costs and biased incentives. The more severe the credit constraints, the higher the likelihood of poor environmental performance being observed. Ultimately, the implications of targeted policies with an emphasis on providing financing facilities for companies.

Research was also conducted by Chang et al. (2019), which empirically proved that the level of environmental governance proxied by government spending on environmental protection as part of gross domestic product (GDP) has a significant impact on environmental conditions among Asian countries. In this study, it can be concluded that authorities must increase the portion of government spending on environmental protection, the government must try to control excessive economic growth that will harm the environment, and foreign investment that has a significant negative impact on energy intensity, thus encouraging the impact of energy efficiency.

Limitations in this study include time constraints in the form of a short period, while environmental performance and the factors that influence it can change over time, so that the results of the study may not reflect long-term trends or the impact of policies implemented in the future. In addition, there is the possibility that other relevant variables are not included in the analysis, for example, factors such as corporate

culture, stakeholder pressure, or broader government policies can affect environmental performance.

D. Conclusion

Financial constraints have a positive and significant effect on environmental performance. Managerial ownership has a positive and significant effect on environmental performance. Independent commissioners have a negative and significant effect on environmental performance. Audit committees have a positive and significant effect on environmental performance. Company size has a positive and significant effect on environmental performance. Profitability has a negative and significant effect on environmental performance. Future research will likely analyze trends and changes in environmental performance over a longer period. In addition, the role of technology and innovation in overcoming financial limitations and improving environmental performance.

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