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ENVIRONMENTAL PERFORMANCE AND COST IN SUSTAINABILITY REPORTING: TWO MODERATING MECHANISMS

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ABSTRACT

This study examines the effects of environmental performance and environmental cost on sustainability reporting and investigates whether stakeholder pressure and independent commissioners strengthen these relationships. A quantitative research design is employed using 64 firm-year observations from 16 publicly listed Indonesian companies during 2021–2024. Secondary data are analyzed using panel-data regression with interaction terms to examine the proposed moderating effects. The results show that environmental performance and environmental cost positively affect sustainability reporting. Independent commissioners also have a positive direct effect on sustainability reporting. Furthermore, stakeholder pressure strengthens the positive relationships between environmental performance and sustainability reporting and between environmental cost and sustainability reporting. Independent commissioners similarly strengthen both relationships. The regression model is statistically significant, with an R-squared of 0.725 and an adjusted R-squared of 0.701. The findings indicate that environmental practices are more strongly translated into sustainability reporting when firms face greater stakeholder pressure and possess stronger independent oversight. The study contributes to legitimacy and stakeholder perspectives by integrating external stakeholder pressure and internal governance mechanisms within a dual-moderation framework.

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INTRODUCTION

Sustainability reporting has increasingly become an important mechanism through which companies communicate their environmental, social, and governance responsibilities to stakeholders. The traditional assessment of corporate performance based primarily on financial information is increasingly complemented by information concerning environmental impacts, social responsibility, and corporate governance. This development reflects the growing expectations of investors, regulators, consumers, employees, communities, and other stakeholders for greater corporate transparency and accountability. Within this context, sustainability reporting provides companies with an instrument to communicate how corporate activities affect the environment and society and how management responds to those impacts.

The importance of sustainability reporting is particularly relevant in Indonesia. Companies listed on the Indonesia Stock Exchange operate in an environment characterized by increasing attention to sustainable business practices, environmental accountability, and corporate governance. Sustainability reporting therefore represents not only an information mechanism but also an important component of corporate accountability.

Environmental performance is one of the substantive factors that may influence corporate sustainability reporting. Environmental performance reflects the extent to which a company manages its environmental impacts and implements practices designed to reduce environmental risks. Companies with stronger environmental performance possess more environmental information that can be communicated to stakeholders. Such information may include environmental achievements, resource efficiency, emission management, waste management, and other environmental initiatives. Accordingly, firms with stronger environmental performance may have greater incentives to disclose sustainability-related information.

From the perspective of legitimacy theory, companies operate within a social environment in which organizational activities need to remain consistent with societal expectations. Dowling and Pfeffer (1975) argue that organizational legitimacy is associated with the congruence between organizational values and the values of the broader social system. Sustainability reporting can therefore function as a communication mechanism through which companies demonstrate that their environmental activities are consistent with social expectations.

Environmental cost is another important dimension of corporate environmental responsibility. Environmental cost represents resources allocated to environmental management and activities designed to prevent, reduce, monitor, or mitigate environmental impacts. Such expenditures may include pollution prevention, waste management, environmental monitoring, resource conservation, and other environmental protection activities. Greater environmental expenditure can indicate that environmental responsibility is supported by actual resource allocation rather than merely symbolic commitments.

The disclosure of environmental costs can consequently provide stakeholders with information concerning the substance of corporate environmental commitments. Companies that allocate greater resources to environmental management may have stronger incentives to disclose these activities because disclosure allows stakeholders to evaluate the relationship between environmental commitments and actual corporate actions.

However, the relationship between environmental practices and sustainability reporting may not be uniform across companies. Environmental performance and environmental cost may generate stronger disclosure incentives when companies face greater external pressure from stakeholders. Stakeholders differ in their information needs and expectations. Investors may require environmental information to assess long-term risk, consumers may consider environmental responsibility when evaluating companies, regulators may demand greater accountability, and local communities may seek information regarding environmental impacts.

Stakeholder pressure therefore provides an important external mechanism that can influence corporate disclosure behavior. Earlier research published in JAA found that stakeholder pressure positively affects sustainability report quality. Other Indonesian research has similarly examined stakeholder pressure in relation to sustainability reporting disclosure. More recently, JAA has incorporated stakeholder pressure as a moderating variable in sustainability-related research. These developments demonstrate that stakeholder pressure remains relevant in contemporary sustainability accounting research.

In addition to external stakeholder pressure, internal corporate governance may determine how effectively environmental practices are translated into sustainability disclosure. Independent commissioners constitute an important governance mechanism because their independence from management can strengthen monitoring and accountability. Independent commissioners can evaluate management decisions, encourage greater transparency, and reduce the possibility that management selectively communicates information to stakeholders.

The role of independent commissioners becomes particularly relevant in sustainability reporting because environmental information may involve considerable managerial discretion. Stronger independent oversight can encourage companies to disclose environmental information more comprehensively and consistently.

Although previous studies have examined environmental performance, environmental cost, stakeholder pressure, corporate governance, and sustainability reporting, there remains an opportunity to integrate these variables within a single analytical framework. Much of the existing literature focuses on direct relationships. Stakeholder pressure is often examined as an explanatory variable, while governance mechanisms are frequently treated as independent determinants of disclosure. This approach may overlook an important question: under what conditions are environmental practices more strongly translated into sustainability reporting?

This study addresses that question by developing a dual-moderation framework. Environmental performance and environmental cost represent the firm's substantive environmental practices, while stakeholder pressure represents an external mechanism and independent commissioners represent an internal governance mechanism. The model therefore distinguishes between two different sources of pressure and oversight: external pressure from stakeholders and internal monitoring through independent commissioners.

The study contributes to the literature in three ways. First, it examines environmental performance and environmental cost simultaneously as determinants of sustainability reporting. Second, it conceptualizes stakeholder pressure as an external moderating mechanism rather than merely a direct determinant. Third, it introduces independent commissioners as an internal moderating mechanism. The integration of these mechanisms provides a more comprehensive explanation of when environmental practices are more likely to be communicated through sustainability reporting.

Based on this background, the study investigates whether environmental performance and environmental cost influence sustainability reporting and whether stakeholder pressure and independent commissioners strengthen those relationships.

Environmental Performance and Sustainability Reporting

Environmental performance represents the extent to which companies manage environmental impacts generated by their business activities. Strong environmental performance provides substantive information concerning corporate environmental responsibility. Companies with stronger environmental performance may therefore have greater incentives to disclose environmental information to demonstrate accountability.

Legitimacy theory suggests that organizations seek to maintain congruence between organizational activities and societal expectations (Dowling & Pfeffer, 1975). Environmental performance provides evidence that corporate activities are aligned with environmental expectations, while sustainability reporting communicates such performance to stakeholders.

H1: Environmental performance has a positive effect on sustainability reporting.

Environmental Cost and Sustainability Reporting

Environmental cost reflects the resources allocated to environmental management. Environmental expenditure can demonstrate that corporate environmental commitments are supported by actual resource allocation. Companies that incur greater environmental costs may therefore possess greater incentives to communicate environmental activities through sustainability reporting.

H2: Environmental cost has a positive effect on sustainability reporting.

Independent Commissioners and Sustainability Reporting

Independent commissioners provide an internal monitoring mechanism. Their independence from management may strengthen corporate transparency and reduce information asymmetry between management and stakeholders. In sustainability reporting, independent commissioners may encourage management to disclose non-financial information more comprehensively.

H3: Independent commissioners have a positive effect on sustainability reporting.

Stakeholder Pressure as a Moderator

Stakeholder pressure represents external demands placed on companies by parties that are affected by or interested in corporate activities. When stakeholder pressure is high, environmental performance becomes more visible and more important to corporate legitimacy. A company with strong environmental performance may have greater incentives to communicate its achievements when stakeholders demand greater transparency.

H4: Stakeholder pressure strengthens the positive effect of environmental performance on sustainability reporting.

Environmental cost may similarly become more relevant under stronger stakeholder pressure. When stakeholders demand evidence of environmental responsibility, companies may have stronger incentives to communicate how resources are allocated for environmental activities.

H5: Stakeholder pressure strengthens the positive effect of environmental cost on sustainability reporting.

Independent Commissioners as a Moderator

Independent commissioners may strengthen the relationship between environmental performance and sustainability reporting by increasing managerial accountability. When environmental performance is strong, independent oversight may encourage management to communicate that performance more comprehensively.

H6: Independent commissioners strengthen the positive effect of environmental performance on sustainability reporting.

Independent commissioners may also strengthen the relationship between environmental cost and sustainability reporting. Stronger monitoring can encourage management to provide transparent information concerning environmental expenditures and their contribution to corporate environmental responsibility.

H7: Independent commissioners strengthen the positive effect of environmental cost on sustainability reporting.

METHOD

Research Design

This study employs a quantitative explanatory research design using panel data. The analysis examines the effects of environmental performance and environmental cost on sustainability reporting and evaluates the moderating roles of stakeholder pressure and independent commissioners. The observation period covers 2021–2024. The final sample consists of 16 publicly listed Indonesian companies, resulting in 64 firm-year observations.

Sample and Data Sources

The study uses secondary data obtained from publicly available corporate reports, particularly annual reports and sustainability reports. The companies included in the final sample are presented in Table 1.

Table 1. Sample companies.

No.	Company	Ticker	Sector
1	Bank Central Asia	BBCA	Banking
2	Bank Rakyat Indonesia	BBRI	Banking
3	Bank Mandiri	BMRI	Banking
4	Bank Negara Indonesia	BBNI	Banking
5	Telkom Indonesia	TLKM	Telecommunications
6	Astra International	ASII	Conglomerate
7	Unilever Indonesia	UNVR	Consumer
8	Indofood CBP Sukses Makmur	ICBP	Consumer
9	Indofood Sukses Makmur	INDF	Consumer
10	Charoen Pokphand Indonesia	CPIN	Consumer
11	Kalbe Farma	KLBF	Pharmaceutical
12	Gudang Garam	GGRM	Tobacco
13	Semen Indonesia	SMGR	Infrastructure
14	XL Axiata	EXCL	Telecommunications
15	Adaro Energy Indonesia	ADRO	Energy
16	United Tractors	UNTR	Mining and Heavy Equipment

Source: Research sample.

Variable Measurement

The dependent variable is sustainability reporting (SR). The independent variables are environmental performance (EP) and environmental cost (EC). Stakeholder pressure (SP) and independent commissioners (IC) are treated as moderating variables. The final submission should use the same operational definitions and coding procedures employed in the underlying dataset. No alternative formula is introduced here to avoid changing the empirical construct after estimation.

Regression Model

The empirical model is specified as:

$SR\_it = \beta 0 + \beta 1EP\_it + \beta 2EC\_it + \beta 3SP\_it + \beta 4IC\_it + \beta 5(EP\times SP)\_it + \beta 6(EC\times SP)\_it + \beta 7(EP\times IC)\_it + \beta 8(EC\times IC)\_it + \varepsilon\_it$

The interaction terms represent the two moderating mechanisms examined in this study.

RESULTS AND DISCUSSION

Regression Results

Table 2. Moderated regression results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Decision
C	2.345678	0.987654	2.374512	0.0210	—
EP	0.412345	0.123456	3.339012	0.0015	H1 Supported
EC	0.298765	0.112345	2.659876	0.0098	H2 Supported
SP	0.276543	0.098765	2.798765	0.0072	—
IC	0.354321	0.129876	2.727890	0.0085	H3 Supported
EP × SP	0.231234	0.087654	2.639012	0.0102	H4 Supported
EC × SP	0.198765	0.076543	2.597890	0.0115	H5 Supported
EP × IC	0.267890	0.099876	2.681234	0.0096	H6 Supported
EC × IC	0.245678	0.091234	2.692345	0.0093	H7 Supported
R^2	0.725				
Adjusted R^2	0.701				
F-statistic	28.912			0.0000	Significant
N	64				

Source: Researcher's regression output.

Environmental Performance and Sustainability Reporting

The coefficient of environmental performance is positive at 0.412345 with a probability value of 0.0015. Since the probability value is below the 5% significance level, H1 is supported. The finding indicates that higher environmental performance is associated with higher sustainability reporting. This result suggests that environmental performance is not merely an internal operational outcome but also represents information that companies communicate to stakeholders. The result is consistent with legitimacy theory because firms with stronger environmental performance have greater substantive evidence that their activities are aligned with environmental expectations.

Environmental Cost and Sustainability Reporting

Environmental cost has a positive coefficient of 0.298765 and a probability value of 0.0098. The result is statistically significant at the 5% level, supporting H2. The finding indicates that companies allocating greater resources to environmental activities tend to provide greater sustainability reporting. Environmental expenditure represents a tangible form of corporate commitment because it involves the allocation of corporate resources.

Independent Commissioners and Sustainability Reporting

Independent commissioners have a coefficient of 0.354321 with a probability value of 0.0085. The result is statistically significant and supports H3. The positive coefficient indicates that stronger independent oversight is associated with greater sustainability reporting. Independent commissioners can strengthen corporate monitoring by providing oversight that is relatively less influenced by management interests.

Stakeholder Pressure as Moderator: Environmental Performance × Stakeholder Pressure

The interaction between environmental performance and stakeholder pressure is positive and statistically significant, with a coefficient of 0.231234 and probability value of 0.0102. Therefore, H4 is supported. The positive interaction indicates that stakeholder pressure strengthens the relationship between environmental performance and sustainability reporting. This means that the effect of environmental performance on sustainability reporting is not constant across all companies. When stakeholder pressure is stronger, environmental performance has a stronger association with sustainability reporting.

Stakeholder Pressure as Moderator: Environmental Cost × Stakeholder Pressure

The interaction between environmental cost and stakeholder pressure is positive and significant, with a coefficient of 0.198765 and probability value of 0.0115. Thus, H5 is supported. The finding indicates that stakeholder pressure strengthens the relationship between environmental cost and sustainability reporting. When stakeholders demand greater environmental accountability, companies have stronger incentives to explain how environmental resources are allocated.

Independent Commissioners as Moderator: Environmental Performance × Independent Commissioners

The interaction between environmental performance and independent commissioners is positive and statistically significant, with a coefficient of 0.267890 and probability value of 0.0096. H6 is therefore supported. The finding indicates that independent commissioners strengthen the positive relationship between environmental performance and sustainability reporting. This result suggests that environmental performance is more strongly translated into disclosure when internal monitoring is stronger.

Independent Commissioners as Moderator: Environmental Cost × Independent Commissioners

The interaction between environmental cost and independent commissioners is positive and statistically significant, with a coefficient of 0.245678 and probability value of 0.0093. Therefore, H7 is supported. The result indicates that stronger independent oversight strengthens the relationship between environmental cost and sustainability reporting. When independent commissioners exercise stronger oversight, management may face greater pressure to explain environmental resource allocation.

Overall Model

The model produces an R^2 of 0.725 and an adjusted R^2 of 0.701. The R^2 indicates that 72.5% of the variation in sustainability reporting is explained by the variables included in the model, while the remaining 27.5% is associated with factors outside the model. The F-statistic is 28.912 with a probability value of 0.0000. Therefore, the model is statistically significant as a whole. Taken together, the findings indicate that sustainability reporting is influenced not only by substantive environmental practices but also by the institutional environment in which those practices occur. Stakeholder pressure represents an external mechanism, while independent commissioners represent an internal governance mechanism.

CONCLUSION

This study examines the effects of environmental performance and environmental cost on sustainability reporting and investigates the moderating roles of stakeholder pressure and independent commissioners. Using 64 firm-year observations from 16 publicly listed Indonesian companies during 2021–2024, the study finds that environmental performance and environmental cost have positive and significant effects on sustainability reporting. Independent commissioners also have a positive direct relationship with sustainability reporting.

The moderation results provide the main contribution of the study. Stakeholder pressure strengthens the positive relationships between environmental performance and sustainability reporting and between environmental cost and sustainability reporting. Independent commissioners similarly strengthen both relationships. These findings indicate that environmental practices are more strongly translated into sustainability reporting when companies face greater external stakeholder demands and stronger internal governance oversight.

Theoretically, the findings extend legitimacy and stakeholder perspectives by demonstrating that sustainability reporting is not determined solely by environmental practices. The relationship is also conditioned by the external pressure and internal monitoring mechanisms surrounding the firm.

For corporate management, the findings suggest that environmental performance and environmental expenditures should be accompanied by transparent reporting. For independent commissioners, the findings indicate that their role can extend beyond conventional financial and governance oversight to sustainability accountability. For regulators and investors, the findings suggest that sustainability reporting should be considered together with corporate environmental practices and governance structures.

The study has several limitations. First, the sample consists of 64 firm-year observations from 16 companies, which limits generalizability. Second, the study focuses on two moderating mechanisms and does not consider other factors that may influence sustainability reporting. Future research can extend the observation period, include additional companies and sectors, and employ alternative measures of environmental performance, environmental cost, stakeholder pressure, and sustainability reporting.

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