International Journal of Sustainable Development and Planning
Vol. 20, No. 9, September, 2025, pp. 4063-4070
Journal homepage: http://iieta.org/journals/ijsdp

Examining the Moderating Effect of External Governance in the Relationship Between Environmental Responsibility and Financial Performance in Indonesian Mining Firms

Hadi Pramono[1,2*], Abdul Rohman[1], Nur Cahyonowati[1]

[1] Faculty of Economics and Business, Universitas Diponegoro, Semarang 50241, Indonesia
[2] Faculty of Economics and Business, Universitas Muhammadiyah Purwokerto, Purwokerto 53182, Indonesia

Corresponding Author Email: pramono.hadi.75@gmail.com

https://doi.org/10.18280/ijsdp.200935

Received: 7 July 2025
Revised: 30 August 2025
Accepted: 25 September 2025
Available online: 30 September 2025

Keywords:
environmental accounting, environmental performance, external governance, financial performance

ABSTRACT

This study aims to empirically demonstrate the role of external governance in the relationship between environmental responsibility and a corporation's financial performance. It is the first study in Indonesia to investigate external governance in the context of debt investor pressure on the environmental responsibility of mining companies. Environmental responsibility is a critical concern for corporations, particularly those in the mining sector. The study employs moderated regression analysis to examine 49 mining companies listed on the Indonesia Stock Exchange from 2020 to 2023. The findings reveal that environmental accounting negatively impacts financial performance, while environmental performance has a positive effect on financial performance. Furthermore, external governance moderates the relationship between environmental performance and financial performance but does not influence the relationship between environmental accounting and financial performance. This study highlights the significant role of external governance in enhancing mining companies' accountability to environmental issues. As a result, it is recommended that management develop sustainable strategies to improve their environmental practices.

1. INTRODUCTION

Financial performance is a crucial tool for evaluating a company's overall success [1]. In today's competitive landscape, accurately assessing financial performance is vital for managers, creditors, current and potential investors, and other companies within the same sector [2]. For shareholders and investors, it is particularly important in publicly traded companies [3]. This importance has increased with economic globalization and financial innovation, where awareness of current trends and challenges is crucial for success [1].

At the same time, financial performance alone is no longer considered sufficient to measure a company's success. Increasing public awareness of environmental impacts has created pressure for companies to adopt corporate social responsibility (CSR) practices [4]. Governments, international organizations, and associations also urge companies to participate in environmental protection through regulations and legislation [5]. As a result, businesses must integrate environmental and social considerations into their operations, as stakeholders no longer judge them solely on profitability.

Environmental degradation caused by corporate activity has become a critical issue with both ecological and economic consequences [6-8]. By 2024, listed companies are expected to contribute 4% of global GDP to environmental damage, or around $3.71 trillion annually (csofutures.com). In Indonesia, the coal industry is a prime example: coal-fired power plants have more than doubled their emissions in the past two decades, with total carbon emissions reaching 600 million metric tons of CO_2 in 2021, making the country the ninth-largest emitter in the world (iea.org). These facts highlight not only the severity of the issue but also the urgent need for research that addresses how companies—particularly in resource-intensive sectors such as mining—can balance financial performance with environmental accountability.

In response to these challenges, environmental accounting has emerged to provide both quantitative and qualitative information about a company's environmental impact. It integrates environmental costs and benefits into business decision-making, aligning financial outcomes with sustainability [9, 10]. As part of sustainable development, environmental accounting, also known as green accounting supports cultural, socio economic, and environmental welfare by combining social, economic, and environmental aspects into a unified framework [7, 11, 12].

Mining companies face unique challenges in achieving sustainability. Unlike other sectors, they must balance economic benefits with environmental preservation and social responsibility, while accounting for geographical, geological, and social contexts [13, 14]. This sector is also highly dynamic, influenced by technological changes, frequent regulatory adjustments, and fluctuating market demand [15]. Therefore, sustainability in mining requires not only operational adaptation but also strong governance mechanisms that ensure accountability, transparency, fairness, and responsibility [16, 17].

Corporate governance, both internal and external, plays a critical role in ensuring companies meet stakeholder expectations [18, 19]. Internal mechanisms include boards, audits, and internal control systems [20], while external mechanisms involve laws, markets, auditors, rating agencies, and institutional investors [21]. Of these, institutional investors are particularly important as they not only provide financing but also exert governance pressure on firms [22, 23].

Against this backdrop, this study examines the role of external governance mechanisms specifically, the influence of institutional investors in strengthening the relationship between environmental accounting, environmental performance, and financial performance in the mining sector. While global studies have explored these relationships, evidence from Indonesia remains limited despite the severity of its coal-related environmental issues. By addressing this gap, the study aims to demonstrate how external governance can act as a catalyst for aligning financial and environmental objectives, thereby contributing to sustainable development in the mining industry.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Environmental accounting and corporate financial performance

Environmental accounting organizes data within the accounting system to develop and clarify several key components: environmental assets, environmental liabilities, environmental revenues, and environmental costs [10]. Additionally, environmental accounting encompasses various financial services that can support initiatives aimed at promoting environmental sustainability [24]. Environmental accounting employs the same methods and principles as traditional accounting for commercial transactions. It is incorporated into the company's overall accounting practices, with a focus on social and environmental factors [10].

Environmental accounting sets itself apart from conventional finance by emphasizing environmental and social sustainability, as well as the long-term well-being of human society [25]. Its primary goal is to promote long-term economic and social development through effective financial management while also protecting the natural environment. Companies that focus on enhancing environmental sustainability engage in what is known as corporate environmental investment. In fact, environmental accounting can significantly benefit businesses by positively impacting both the environment and their financial performance [26]. The first hypothesis proposed is:

H1: *Environmental accounting has a positive effect on financial performance*.

2.2 Environmental performance and financial performance

The relationship between environmental and financial performance is still widely studied [27]. Some researchers who adhere to neo-classical theory argue that there is a negative relationship between the two [28, 29]. They claim that companies in industries that are required to allocate significant environmental compliance costs, such as mining, face a competitive disadvantage because the costs associated with compliance exceed the added value generated for the company. In contrast, other researchers who refer to Porter's theory argue that high corporate environmental performance can improve finances [27, 30, 31]. They argue that improving environmental performance can support competitive advantage because it can carry out more efficient processes, increase productivity, reduce compliance costs, and create new market opportunities [27]. This hypothesis is in line with Porter's theory, which states that:

H2: *Environmental performance has a positive effect on financial performance*.

2.3 External governance and financial performance

Corporate governance is the responsibility of a group of individuals who are directly involved in the company's business operations and policies, and they are responsible for the company's effectiveness and its obligations to shareholders to ensure that investors receive a return on their investment [32]. Corporate governance relates to corporate culture [33]. Organizational culture can influence disclosure transparency. Therefore, informal governance mechanisms can be crucial in providing non-financial information to stakeholders [34]. If an organization changes its culture towards greater transparency and collaboration, it can voluntarily share additional information with external parties [33].

Sustainability performance has financial implications that can affect corporate disclosure, value, and investment [35]. However, due to corporate interests, sustainability reports often need to be more accurate, resulting in stakeholders making appropriate decisions [36]. As a result, stakeholders require reliable, accurate, and transparent non-financial information [37]. As a result, there is a growing demand for stricter governance and more transparent and more understandable disclosure [35].

External governance mechanisms are essential because they help ensure that company management respects the rights and interests of stakeholders while maintaining mutually beneficial relationships [38]. Corporate governance can also be understood as a system of laws, rules, and factors that enable a company to function effectively [39]. External mechanisms encompass the company's external environment, regulatory and market forces, and various stakeholders. This framework helps control the company's operations, safeguard the rights and interests of shareholders, and provide overall strategic guidance [35].

H3: *External governance has a positive effect on financial performance*.

2.4 The role of external governance as a moderator variable

Implementing good corporate governance is one of the alternatives for companies in regulating, managing, and supervising the relationship between company managers and stakeholders to increase the company's value. One of the basic principles in implementing good corporate governance is transparency. Implementing the principle of transparency will make the company more transparent and encourage companies to disclose more information about the economy, environment, and society [40].

Internal and external control mechanisms in corporate governance align management and stakeholder interests [17, 41]. Internal mechanisms are components of governance in a company, which generally consist of commissioners, directors, audit committees [42], and risk management committees [43]. Conversely, the external governance mechanisms consist of government bodies, financial institutions [44], external auditors [41], market forces, institutional investors, and creditors [45].

Management decisions refer to corporate governance mechanisms, especially when ownership and control are separated [46]. The demands of companies to care about the environment, including all matters related to products, processes, energy consumption, and waste management, require corporate governance to be environmentally aware so that corporate behavior and strategies must refer to the use of sustainable resources and adopt an environmental management system [21]. In addition, corporate governance must also pay attention to the rights and responsibilities of companies related to environmental sustainability issues [21]. Decision-making in environmental governance is guided by four integrated and interrelated criteria: efficiency, effectiveness, fairness, and legitimacy [47]. In contrast, protected area governance employs evaluative indicators such as quality, diversity, and vitality [48].

According to Gillan [19], environmental corporate governance that relies on government regulations is part of the external governance mechanism. Various external factors - including laws, regulations, media influence, product competition, investors, and external audits- can constrain managerial opportunism. As a result, these factors effectively reduce agency costs, enhance performance efficiency, and improve a company's financial results [35].

H4: *External governance plays a role in increasing the effect of environmental accounting on financial performance*.

2.5 The moderating role of external governance

Environmental performance refers to the assessment of various factors that impact a company's sustainability and provides access to crucial environmental information. It is closely linked to data within the accounting system and encompasses several components: environmental assets (investments made to protect the environment), environmental liabilities (obligations that may arise in relation to environmental impacts), environmental revenues (economic benefits derived from effective environmental management), environmental costs (expenses associated with the use of both renewable and non-renewable resources). This comprehensive approach helps organizations understand their environmental impact and promotes better sustainability practices [49].

In addition to internal pressures, companies can improve their sustainability performance in response to external pressures from the stakeholders involved. There are increasing demands from stakeholders (investors, customers, governments, and non-governmental organizations) to make companies more transparent and accountable in their sustainability activities [50]. It is impossible for companies to disengage from their relationships with stakeholders [51]. Consequently, company management will utilize its influence to balance the interests of these stakeholders. They will then determine the extent to which the company can meet the expectations and requirements of its stakeholders [52].

H5: *External governance plays a role in increasing the effect of environmental performance on financial performance*.

3. RESEARCH DESIGN

This study examines all mining companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2023. The sample encompasses mining companies operating within Indonesia. According to IDX.co.id, one of the largest mining companies in the country caused significant environmental damage between 2015 and 2022, resulting in state losses amounting to IDR 271.06 trillion (antara.com). Mining companies were selected as research samples because the mining sector provides significant economic benefits, particularly in developing countries [53]. However, this sector's operations have a direct impact on both the environment and society [14], making it crucial to focus on sustainability through the implementation of environmental accounting [49].

The sampling process involved several stages of screening. From the total population of 66 companies, 26 were excluded due to incomplete data, leaving 40 companies with 160 observations. Subsequently, 20 outliers were removed to ensure the robustness of statistical analysis, resulting in 140 final observations used in the regression analysis. This process of data cleaning and outlier removal strengthens the reliability of the findings.

The dependent variable in this study is financial performance, defined as the company's ability to generate profits, maintain liquidity, and achieve long-term financial sustainability. Financial performance is proxied by the Net Profit Margin (NPM), as this ratio directly reflects a company's ability to convert sales revenue into profit, making it particularly relevant for assessing operational efficiency. While NPM provides a focused view on profitability relative to sales, it does not capture asset utilization or equity returns. Financial, to provide a more comprehensive picture of financial performance, additional measures are suggested, namely Return on Assets (ROA) and Return on Equity (ROE).

Scale of 1 to 5: Gold (5) represents excellence in environmental and social innovation, Green (4) indicates compliance beyond requirements, Blue (3) reflects minimum compliance, Red (2) denotes failure to meet standards, and Black (1) is given to companies causing severe environmental damage.

Moderator variables can increase, decrease, or change the direction of the relationship between endogenous and exogenous variables. In this study, the moderator is the external governance mechanism represented by leverage (Lev), which proxies' debt investor pressure. Debt investors often encourage companies to disclose environmental commitments to reduce risk and enhance corporate reputation [19, 54]. The measurement of environmental accounting in this study is formulated as follows:

$$Environmental\ Expenses = \frac{Provision}{Net\ Profit}$$

Control variables are included to ensure the accuracy of the relationships examined. This study uses company size (Sz), measured as the natural logarithm of total assets, and company age, measured in years since establishment.

The data were analyzed using IBM SPSS software version 27, with the following regression models:

$$NPM = \alpha + \beta_1 EnvAcc + \beta_2 PROP + \beta_3 Lev + \beta_4 Sz + \varepsilon \quad (1)$$

$$NPM = \alpha + \beta_1 EnvAcc + \beta_2 Prop + \beta_3 EnvAcc*Lev + \beta_3 Prop*Lev + \beta_4 Sz + \varepsilon \quad (2)$$

4. RESULTS

The research data sources include annual, financial, sustainability, and social and environmental responsibility reports from 66 mining companies listed on the IDX from 2020 to 2023. Of these, 26 companies did not have data related to the research variables. Thus, the final data used for this study amounted to 160 observations. Referring to Table 1, the dependent variable (NPM) and independent variables (Environmental etc.) have standard deviations higher than the average value, so it is estimated that there are outliers or extreme values. LnSize as a control variable shows an average value of 29.713, equivalent to $2.205 billion. The total asset value shows that the mining company used as a sample is a large company. This is reasonable because the company's age is considered mature, with an average of 33 years. The lowest PROPER score is 3 (blue), and the highest is 5 (gold). At the same time, the highest PROPER score is ranked 4 (green) at 61 or 38.1%. This indicates that most mining companies must be more optimal in their environmental responsibilities (Table 2).

Table 1. Descriptive statistics

Variable	n	Minimum	Maximum	Average	Std. Dev
NPM	160	-54.90	53.86	6.0463	13.066
EnvAcc	160	-1.17	21.59	0.6399	2.276
Lev	160	-0.40	1132.00	16.4754	96.668
Size	160	0.05	32.77	29.713	3.533
Age	160	3	55	33.48	13.157

The initial dataset consisted of 160 observations. However, during the descriptive statistical test, 20 data points were identified as outliers. These outliers were removed rather than transformed or winsorized because their extreme values had the potential to disproportionately distort the regression results and violate classical assumptions. By eliminating these data points, the analysis ensured a more reliable and unbiased estimation of the model parameters. After this data cleaning process, the final dataset used for the classical assumption test consisted of 140 observations.

Table 2. Frequency distribution of PROPER

Score	Frequency	Percent
3	53	33.1
4	61	38.1
5	46	28.1

The analysis of data normality indicates a significant asymptotic value of 0.124 in the Kolmogorov-Smirnov test and a Monte Carlo value of 0.116, suggesting that the data is normally distributed. We employed the Durbin-Watson method to test autocorrelation, which produced a Durbin-Watson (DW) value of 2.139. When comparing this to the lower bound (dl) value of 1.666 and the upper bound (du) value of 1.783, the data is not affected by autocorrelation, as the DW value falls within the range of $du < DW < (4 - du)$.

In the multicollinearity assessment, all variance tolerance values were greater than 0.10, and the Variance Inflation Factor (VIF) values were all below 10. Finally, the heteroscedasticity test, conducted using the Glejser method, showed that all variable significance values were greater than 0.05, indicating no issues with heteroscedasticity (Table 3).

The ANOVA test results, both the F-statistic and its significance value, indicate that the regression model is suitable for this study (Table 4). In Model 1, the Adjusted R^2 value was 0.165, meaning that the independent variables explain only 16.5% of the variation in financial performance, while the remaining 83.5% is influenced by other factors not included in the model. When the moderating variable was added in Model 2, the Adjusted R^2 value slightly increased to 0.170. Although these values confirm that the models are statistically valid, the relatively low explanatory power indicates that the ability of the proposed variables to explain financial performance is weak. This limitation should be acknowledged, as it suggests that additional factors outside the scope of this study may play a more significant role in influencing financial performance.

Table 3. Classical assumption test

Test	Normality	Autocorrelation	Multicollinearity	Heteroscedasticity
Asymp. Sig	0.124	-	-	-
Monte Carlo Sig	0.116	-		-
Durbin-Watson	-	2.139	-	-
Tolerance:				
Env.Expens	-	-	0.671	-
Proper	-	-	0.972	-
Leverage	-	-	0.675	-
Size	-	-	0.975	-
Age	-	-	0.935	-
Significan value:				
Env.Expens	-	-	-	0.44
Proper	-	-	-	0.167
Leverage	-	-	-	0.062
Size	-	-	-	0.061
Age	-	-	-	0.067
Test	Normality	Autocorrelation	Multicollinearity	Heteroscedasticity
Asymp. Sig.	0.124	-	-	-

Table 4. Model fit test

Regression Model	ANOVA		Adjusted R^2
	F	Sig.	
Direct Testing	7.868	0.000	0.165
Testing with Moderation	6.684	0.000	0.170

Table 5. Regression test

Hypothesis	Coefficient	t	Sig.	Description
H1	-0.289	-2.572	0.011	Rejected
H2	0.341	1.532	0.128	Rejected
H3	0.003	2.737	0.007	Accepted
H4	8.950	0.186	0.853	Rejected
H5	0.003	1.950	0.053	Accepted
Dependent Variable: Net Profit Margin				

Based on the regression analysis results in Table 5, the significance value of H1 < 0.05 with a coefficient value of -0.307 indicates that environmental accounting negatively affects company value. At the same time, H2 shows a significance value > 0.05, providing statistical evidence that environmental performance does not have a direct impact on financial performance. This finding contrasts with the statement in the abstract, which suggested a positive effect. Therefore, H2 is rejected, and this discrepancy needs to be acknowledged as a divergence between the initial expectation and the empirical results.

H3 shows a significant value < 0.05 with a coefficient value of 0.013, meaning that leverage positively affects financial performance. H4 shows a significance value > 0.05, meaning that the leverage variable (external governance) cannot strengthen the relationship between environmental accounting and financial performance. H5 shows a significant value < 0.05 with a coefficient of 0.003, meaning that leverage (external governance) can strengthen the relationship between environmental performance and financial performance, or in other words, leverage acts as a moderating variable.

5. DISCUSSION

5.1 Environmental accounting on financial performance

Based on the results of the analysis, environmental accounting has a negative impact on financial performance. Although the main objective of environmental accounting is to improve sustainability and social responsibility, environmental accounting can have a negative impact on a company's financial performance. This can be caused because its implementation requires significant cost allocations for environmental activities such as pollution prevention, environmental audits, and disclosure of related costs in financial statements [55]. In addition, companies that significantly allocate budgets for environmental costs can be perceived as less focused on financial performance [55]. This can affect investor interest or cause stock prices to decline, especially in industries where the market highly regards profit margins.

5.2 Environmental performance on financial performance

In this study, environmental performance does not affect company performance. This may be because Indonesia has environmental regulations to pressure companies to carry out environmental performance, in this study measured by PROPER. According to Albertini [56], companies operating in areas with strict environmental laws must have higher compliance costs, which can reduce profitability if these costs are not offset by market incentives or consumer demand. The results of this study, which is related to the influence of environmental performance on financial performance, support the neo-classical theory and disagree with Porter's theory.

5.3 External governance on financial performance

This study states that external governance proxied by debt investor pressure can positively affect financial performance. According to Forte and Tavares [57], the impact of debt on company performance is highly dependent on institutional factors such as credit market regulation and the efficiency of the legal system. According to Öhman and Yazdanfar [58], although high debt levels increase risk and agency costs, debt can improve financial performance at optimal levels. This is due to the company's ability to utilize leverage to increase its operations' scale without sacrificing available equity.

5.4 The role of external governance on environmental accounting and financial performance

The role of external governance in this study as a moderator variable. Interestingly, the environmental performance variable could not influence the company's financial performance before interacting with external governance. However, external governance strengthened the relationship between environmental and financial performance after interacting. This can be understood if debt investor pressure can drive companies to care about their environmental responsibilities. Lu and Taylor [27] also conveyed that the higher the environmental performance, the more it will improve the company's financial performance, which aligns with Porter's theory.

6. CONCLUSION

This study provides new insights into the relationship between corporate environmental responsibility and financial performance. It is also the first to examine how environmental accounting and environmental performance impact financial performance, with external governance -represented by debt pressure- as a moderating factor. The results indicate that external governance influences the relationship between environmental accounting and financial performance. Additionally, in the context of the relationship between environmental performance and financial performance, external governance acts as a quasi-moderator. This means that while it affects financial performance, it also strengthens the link between environmental performance and financial performance. The recommendation suggested for further research is to add or use external governance variables other than debt pressure because corporate governance has other elements, both from internal mechanisms and external mechanisms. Further researchers can also expand the sample size in terms of time dimensions and company criteria.

REFERENCES

[1] Kaya, A., Pamucar, D., Gürler, H.E., Ozcalici, M. (2024). Determining the financial performance of the firms in the Borsa Istanbul sustainability index: Integrating multi criteria decision making methods with simulation. Financial Innovation, 10(1): 21. https://doi.org/10.1186/s40854-023-00512-3

[2] Alossta, A., Elmansouri, O., Badi, I. (2021). Resolving a location selection problem by means of an integrated AHP-RAFSI approach. Reports in Mechanical Engineering, 2(1): 135-142. https://doi.org/10.31181/rme200102135a

[3] Chen, T., Dong, H., Lin, C. (2020). Institutional shareholders and corporate social responsibility. Journal of Financial Economics, 135(2): 483-504. https://doi.org/10.1016/j.jfineco.2019.06.007

[4] Eckert, C. (2017). Corporate reputation and reputation risk: Definition and measurement from a (risk) management perspective. Journal of Risk Finance, 18(2): 145-158. https://doi.org/10.1108/JRF-06-2016-0075

[5] Deswanto, R.B., Siregar, S.V. (2018). The associations between environmental disclosures with financial performance, environmental performance, and firm value. Social Responsibility Journal, 14(1): 180-193. https://doi.org/10.1108/SRJ-01-2017-0005

[6] Rahman, M.H., Rahman, J., Tanchangya, T., Esquivias, M.A. (2023). Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India. Research in Globalization, 7(6): 100184. https://doi.org/10.1016/j.resglo.2023.100184

[7] Rahman, M.H., Majumder, S.C. (2022). Empirical analysis of the feasible solution to mitigate the CO_2 emission: Evidence from Next-11 countries. Environmental Science and Pollution Research, 29(48): 73191-73209. https://doi.org/10.1007/s11356-022-20908-5

[8] Voumik, L.C., Rahman, M.H., Nafi, S.M., Hossain, M.A., Ridzuan, A.R., Mohamed Yusoff, N.Y. (2023). Modelling sustainable non-renewable and renewable energy based on the EKC hypothesis for Africa's ten most popular tourist destinations. Sustainability, 15(5): 1-19. https://doi.org/10.3390/su15054029

[9] Hong Nga, T., Viet Ha, T., Thanh Loan, T. (2018). Green accounting and sustainable development of listed Vietnamese enterprises. In Proceedings of 14th International Conference on Humanities and Social Sciences 2018 (IC-HUSO 2018), pp. 379-391.

[10] Domínguez-Gómez, J.A., González-Gómez, T. (2021). Governance in mining: Management, ethics, sustainability and efficiency. Extractive Industries and Society, 8(3): 100910. https://doi.org/10.1016/j.exis.2021.100910

[11] Bekuma, T., Mamo, G., Regassa, A. (2023). Indigenous and improved adaptation technologies in response to climate change adaptation and barriers among smallholder farmers in the East Wollega Zone of Oromia, Ethiopia. Research in Globalization, 6: 100110. https://doi.org/10.1016/j.resglo.2022.100110

[12] Mir, A.A., Bhat, A.A. (2022). Green banking and sustainability – A review. Arab Gulf Journal of Scientific Research, 40(3): 247-263. https://doi.org/10.1108/AGJSR-04-2022-0017

[13] Mata, M., Hlaváček, P. (2025). Navigating sustainability in lithium extraction: Local perceptions of environmental and economic impacts in the Cínovec Region, Czech Republic. Challenges in Sustainability, 13(2): 254-265. https://doi.org/10.56578/cis130207

[14] Xue, S., Jiang, Y., Wei, Q. (2024). Green financial accounting and transition in the mining sector in emerging economies. Resources Policy, 89(3): 104683. https://doi.org/10.1016/j.resourpol.2024.104683

[15] Li, Y., Barrueta Pinto, M.C., Kumar, D.T. (2023). Analyzing sustainability indicator for Chinese mining sector. Resources Policy, 80: 103275. https://doi.org/10.1016/j.resourpol.2022.103275

[16] Aras, G., Crowther, D., Crowther, D. (2009). Corporate sustainability reporting-A study in disingenuity? Journal of Business Ethics, 87(1): 279-288. https://doi.org/10.1007/s10551-008-9806-0

[17] Jamil, A., Mohd Ghazali, N.A., Puat Nelson, S. (2021). The influence of corporate governance structure on sustainability reporting in Malaysia. Social Responsibility Journal, 17(8): 1251-1278. https://doi.org/10.1108/SRJ-08-2020-0310

[18] Boiral, O., Henri, J.F. (2017). Is sustainability performance comparable? A study of GRI reports of mining organizations. Business and Society, 56(2): 283-317. https://doi.org/10.1177/0007650315576134

[19] Gillan, S.L. (2006). Recent developments in corporate governance: An overview. Journal of Corporate Finance, 12(3): 381-402. https://doi.org/10.1016/j.jcorpfin.2005.11.002

[20] Nguyen, T.H.H., Elmagrhi, M.H., Ntim, C.G., Wu, Y. (2021). Environmental performance, sustainability, governance and financial performance: Evidence from heavily polluting industries in China. Business Strategy and the Environment, 30(5): 2313-2331. https://doi.org/10.1002/bse.2748

[21] Aguilera, R.V., Aragón-Correa, J.A., Marano, V., Tashman, P.A. (2021). The corporate governance of environmental sustainability: A review and proposal for more integrated research. Journal of Management, 47(6): 1468-1497. https://doi.org/10.1177/0149206321991212

[22] Boubaker, S., Chourou, L., Saadi, S., Zhong, L. (2019). Does institutional investor horizon influence US corporate financing decisions? International Review of Financial Analysis, 63: 382-394. https://doi.org/10.1016/j.irfa.2017.09.001

[23] Ongena, S., Zalewska, A.A. (2018). Institutional and individual investors: Saving for old age. Journal of Banking & Finance, 92: 257-268. https://doi.org/10.1016/j.jbankfin.2017.10.012

[24] Al Amin, M., Ahad Mia, M.A., Bala, T., Iqbal, M.M., Alam, M.S. (2023). Green finance continuance behavior: The role of satisfaction, social supports, environmental consciousness, green bank marketing initiatives and psychological reactance. Management of Environmental Quality: An International Journal, 34(5): 1269-1294. https://doi.org/10.1108/MEQ-09-2022-0257

[25] Desiderio, E., García-Herrero, L., Hall, D., Segrè, A., Vittuari, M. (2022). Social sustainability tools and indicators for the food supply chain: A systematic literature review. Sustainable Production and Consumption, 30: 527-540. https://doi.org/10.1016/j.spc.2021.12.015

[26] Akhtar, S., Tian, H., Alsedrah, I.T., Anwar, A., Bashir, S. (2024). Green mining in China: Fintech's contribution to

enhancing innovation performance aimed at sustainable and digital transformation in the mining sector. Resources Policy, 92: 104968. https://doi.org/10.1016/j.resourpol.2024.104968
[27] Lu, L.W., Taylor, M.E. (2018). A study of the relationships among environmental performance, environmental disclosure, and financial performance. Asian Review of Accounting, 26(1): 107-130. https://doi.org/10.1108/ARA-01-2016-0010
[28] Lorraine, N.H.J., Collison, D.J., Power, D.M. (2004). An analysis of the stock market impact of environmental performance information. Accounting Forum, 28(1): 7-26. https://doi.org/10.1016/j.accfor.2004.04.002
[29] Murray, A., Sinclair, D., Power, D., Gray, R. (2006). Do financial markets care about social and environmental disclosure?: Further evidence and exploration from the UK. Accounting, Auditing and Accountability Journal, 19(2): 228-255. https://doi.org/10.1108/09513570610656105
[30] Al-Tuwaijri, S.A., Christensen, T.E., Hughes, K.E. (2004). The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach. Accounting, Organizations and Society, 29(5-6): 447-471. https://doi.org/10.1016/S0361-3682(03)00032-1
[31] Davis, A.K., Guenther, D.A., Krull, L.K., Williams, B.M. (2016). Do socially responsible firms pay more taxes? Accounting Review, 91(1): 47-68. https://doi.org/10.2308/accr-51224
[32] Shleifer, A., Vishny, R.W. (1997). A survey of corporate governance. The Journal of Finance, LII(2): 737-783. https://scholar.harvard.edu/files/shleifer/files/surveycorpgov.pdf.
[33] Dimes, R., Molinari, M. (2023). Non-financial reporting and corporate governance: A conceptual framework. Sustainability Accounting, Management and Policy Journal, 15(5): 1067-1093. https://doi.org/10.1108/SAMPJ-04-2022-0212
[34] Guiso, L., Sapienza, P., Zingales, L. (2015). The value of corporate culture. Journal of Financial Economics, 117(1): 60-76. https://doi.org/10.1016/j.jfineco.2014.05.010
[35] Liu, P., Li, Z., Luo, P. (2023). External corporate governance and assurance of corporate social responsibility reports: Evidence from China. Sustainability Accounting, Management and Policy Journal, 14(2): 420-457. https://doi.org/10.1108/SAMPJ-05-2022-0260
[36] Simnett, R. (2012). Assurance of sustainability reports: Revision of ISAE 3000 and associated research opportunities. Sustainability Accounting, Management and Policy Journal, 3(1): 89-98. https://doi.org/10.1108/20408021211223570
[37] Buertey, S. (2021). Board gender diversity and corporate social responsibility assurance: The moderating effect of ownership concentration. Corporate Social Responsibility and Environmental Management, 28(6): 1579-1590. https://doi.org/10.1002/csr.2121
[38] Aguilera, R.V., Desender, K., Bednar, M.K., Lee, J.H. (2015). Connecting the dots: Bringing external corporate governance into the corporate governance puzzle. Academy of Management Annals, 9(1): 483-573. https://doi.org/10.1080/19416520.2015.1024503
[39] Gillan, S., Starks, L.T. (1998). A survey of shareholder activism: Motivation and empirical evidence. SSRN. http://doi.org/10.2139/ssrn.663523
[40] Madona, M.A., Khafid, M. (2020). Pengaruh good corporate governance terhadap pengungkapan sustainability report dengan ukuran perusahaan sebagai pemoderasi. Jurnal Optimasi Sistem Industri, 19(1): 22-32. https://doi.org/10.25077/josi.v19.n1.p22-32.2020
[41] Schäuble, J. (2019). The impact of external and internal corporate governance mechanisms on agency costs. Corporate Governance (Bingley), 19(1): 1-22. https://doi.org/10.1108/CG-02-2018-0053
[42] Cancela, B.L., Neves, M.E.D., Rodrigues, L.L., Gomes Dias, A.C. (2020). The influence of corporate governance on corporate sustainability: New evidence using panel data in the Iberian macroeconomic environment. International Journal of Accounting and Information Management, 28(4): 785-806. https://doi.org/10.1108/IJAIM-05-2020-0068
[43] Khalaf, A.T., Wei, Y., Wan, J., Abdul Kadir, S.Y., Zainol, J., Jiang, H., Abdalla, A.N. (2023). How did the pandemic affect our perception of sustainability? Enlightening the major positive impact on health and the environment. Sustainability, 15(2): 892. https://doi.org/10.3390/su15020892
[44] Habib, A., Jiang, H. (2015). Corporate governance and financial reporting quality in China: A survey of recent evidence. Journal of International Accounting, Auditing and Taxation, 24: 29-45. https://doi.org/10.1016/j.intaccaudtax.2014.12.002
[45] Teng, C.C., Li, S., Yang, J.J. (2021). Family control, external governance mechanisms, and dividend payouts. Quarterly Review of Economics and Finance, 79: 198-209. https://doi.org/10.1016/j.qref.2020.05.012
[46] Armstrong, C.S., Blouin, J. L., Jagolinzer, A.D., Larcker, D.F. (2015). Corporate governance, incentives, and tax avoidance. Journal of Accounting and Economics, 60(1): 1-17. https://doi.org/10.1016/j.jacceco.2015.02.003
[47] Adger, W.N., Brown, K., Fairbrass, J., Jordan, A., Paavola, J., Rosendo, S., Seyfang, G. (2003). Governance for sustainability: Towards a "thick" analysis of environmental decisionmaking. Environment and Planning A, 35(6): 1095-1110. https://doi.org/10.1068/a35289
[48] Bennett, N.J., Satterfield, T. (2018). Environmental governance: A practical framework to guide design, evaluation, and analysis. Conservation Letters, 11(6): e12600. https://doi.org/10.1111/conl.12600
[49] Gonzalez, C.C., Mendoza, K.H. (2021). Green accounting in Colombia: A case study of the mining sector. Environment, Development and Sustainability: A Multidisciplinary Approach to the Theory and Practice of Sustainable Development, 23(4): 6453-6465. https://doi.org/10.1007/s10668-020-00880-1
[50] Mitchell, R.K., Agle, B.R., Wood, D.J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. The Academy of Management Review, 22(4): 853-886. https://doi.org/10.2307/259247
[51] Manetti, G. (2011). The quality of stakeholder engagement in sustainability reporting: Empirical evidence and critical points. Corporate Social Responsibility and Environmental Management, 18(2): 110-122. https://doi.org/10.1002/csr.255
[52] Johnson, M., Redlbacher, F., Schaltegger, S. (2018).

Stakeholder engagement for corporate sustainability: A comparative analysis of B2C and B2B companies. Corporate Social Responsibility and Environmental Management, 25(4): 659-673. https://doi.org/10.1002/csr.1484
[53] Alves, W., Ferreira, P., Araújo, M. (2021). Challenges and pathways for Brazilian mining sustainability. Resources Policy, 74: 101648. https://doi.org/10.1016/j.resourpol.2020.101648
[54] García-Meca, E., Pucheta-Martínez, M.C. (2018). How institutional investors on boards impact on stakeholder engagement and corporate social responsibility reporting. Corporate Social Responsibility and Environmental Management, 25(3): 237-249. https://doi.org/10.1002/csr.1451
[55] De Micco, P., Rinaldi, L., Vitale, G., Cupertino, S., Maraghini, M.P. (2020). The challenges of sustainability reporting and their management: The case of Estra. Meditari Accountancy Research, 29(3): 430-448. https://doi.org/10.1108/MEDAR-09-2019-0555
[56] Albertini, E. (2013). Does environmental management improve financial performance? A meta-analytical review. Organization and Environment, 26(4): 431-457. https://doi.org/10.1177/1086026613510301
[57] Forte, R., Tavares, J.M. (2019). The relationship between debt and a firm's performance: The impact of institutional factors. Managerial Finance, 45(9): 1272-1291. https://doi.org/10.1108/MF-04-2018-0169
[58] Öhman, P., Yazdanfar, D. (2015). Debt financing and performance: An empirical study based on Swedish data. The Journal of Risk Finance, 16(1):102-118. https://doi.org/10.1108/JRF-06-2014-0085