The Effect of Managerial Ownership, Leverage and Profitability on Financial Distress: Evidence from the Mining Companies Listed on the Indonesıa Stock Exchange

Doni Septa Putra [1], Rizky Yudaruddin[2*]

[1]Fakultas Ekonomi dan Bisnis, Universitas Mulawarman, Indonesia
[2]Fakultas Ekonomi dan Bisnis, Universitas Mulawarman, Indonesia
*rizky.yudaruddin@feb.unmul.ac.id

Abstract. This study examines the effect of managerial ownership, leverage, and profitability on financial distress in mining companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period. Using panel data from 51 firms selected through purposive sampling, the analysis employs a Random Effect Model to assess whether ownership-based governance remains effective within a capital-intensive and highly volatile industry context. The findings indicate that managerial ownership does not significantly influence financial distress, suggesting that incentive alignment mechanisms may have limited effectiveness when firms operate under strong structural and external pressures. In contrast, leverage emerges as a dominant source of financial vulnerability, while profitability plays a stabilizing role by strengthening internal financial capacity. These results contribute to the financial distress literature by demonstrating that the effectiveness of governance mechanisms is conditional on industry characteristics and that financial structure and operating performance play a more decisive role in determining firm resilience within the mining sector.

Keywords: Managerial Ownership, Leverage, Profitability, Financial Distress

1. Introductıon

Agency Theory offers a relevant framework for understanding how conflicts of interest between shareholders and managers may influence a firm's financial condition. In principle, managerial ownership is expected to reduce agency problems by aligning managerial incentives with shareholder interests, thereby encouraging prudent financial decisions and lowering the risk of financial distress [1, 2]. However, the effectiveness of this governance mechanism may depend on industry characteristics. In capital-intensive sectors such as mining, strategic decisions are often constrained by high fixed costs, long investment horizons, and strong dependence on external financing. As a result, managerial discretion may be limited, potentially weakening the role of ownership-based governance in mitigating financial distress.

This concern is particularly relevant in Indonesian mining companies, where firms operate under volatile commodity price cycles, strict regulatory oversight, and substantial leverage requirements to finance large-scale projects. Under such conditions, external factors may dominate internal governance mechanisms, raising questions about whether managerial ownership remains an effective tool for improving financial stability. Despite the importance of this issue, empirical evidence on the role of governance variables in Indonesian mining firms remains limited and inconclusive.

Prior studies on financial distress have largely focused on manufacturing or financial sectors, treated managerial ownership as uniformly effective across industries, or examined distress determinants under relatively stable economic conditions. Few studies explicitly consider whether governance mechanisms continue to function as intended in highly volatile, capital-intensive industries, particularly during periods marked by economic shocks such as the COVID-19 pandemic and post-pandemic commodity price fluctuations. Consequently, the interaction between governance structure, capital structure, profitability, and financial distress in the mining sector remains underexplored.

Against this backdrop, this study aims to examine the influence of managerial ownership, leverage, and profitability on financial distress among mining companies listed on the Indonesia Stock Exchange during the 2019–2023 period. Specifically, this research seeks to assess whether managerial ownership effectively reduces financial distress in a sector characterized by high leverage and external volatility, and to identify the relative importance of financial structure and operational performance in determining firm resilience.

This study contributes to the financial distress literature in three ways. First, it provides sector specific evidence from the Indonesian mining industry, a capital intensive and commodity dependent sector that has received limited attention in governance focused distress studies. Second, it evaluates the effectiveness of managerial ownership as a governance mechanism under conditions of heightened uncertainty, offering insight into its limitations in emerging market contexts. Third, by jointly examining managerial ownership, leverage, and profitability, this study clarifies the dominant drivers of financial distress in mining firms, thereby addressing a gap in prior research that has largely examined these factors in isolation.

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2 Literature Review

2.1. Agency Theory

Agency theory, introduced by Jensen and Meckling [1], explains the conflicts that arise when ownership and control are separated, as principals delegate decision-making authority to managers who may pursue personal interests rather than maximizing shareholder wealth. These agency problems are exacerbated in large firms where dispersed ownership limits direct oversight, allowing managers to engage in behaviors such as empire-building, excessive risk-taking, or avoiding necessary restructuring actions, all of which increase the risk of financial distress [3, 4]. Agency conflicts can also emerge between shareholders and creditors, particularly during financial distress when managers may shift risks to benefit shareholders at creditors' expense [5]. To mitigate these issues, firms implement governance mechanisms such as monitoring systems, independent boards, and equity-based compensation that align managerial incentives with shareholder interests [6]. Overall, agency theory highlights how misaligned incentives can lead to inefficiencies, poor decisions, and heightened financial distress, emphasizing the importance of effective corporate governance for organizational stability.

2.2. Financial Distress

Financial distress occurs when a business struggles to meet its financial obligations, such as repaying debts or covering operational expenses. Baldwin & Mason [7] describe it as a condition in which firms fail to generate sufficient resources to meet their commitments, a situation that often precedes more severe outcomes such as bankruptcy or liquidation [8]. Financial distress may arise from various internal and external factors, including operational inefficiencies, excessive leverage, adverse macroeconomic conditions, poor managerial decisions, or unexpected events like natural disasters or litigation [9, 10]. Early warning indicators include declining revenues, negative cash flows, deteriorating liquidity ratios, and difficulty securing new financing [11]. If unaddressed, financial distress can lead to layoffs, legal action, investor distrust, and wider economic disruption [12]. Companies typically respond through cost restructuring, debt renegotiation, capital infusion, or, in severe cases, bankruptcy reorganization [12, 13]. In this study, financial distress is measured using the Altman Z-Score, a widely adopted predictive model developed by Altman [14], and the measurement formula is presented as follows:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

Z: Z-Score
X_1: Working Capital / Total Assets
X_2: Retained Earnings / Total Assets
X_3: Earnings Before Interest and Taxes (EBIT) / Total Assets
X_4: Market Value of Equity / Book Value of Total Liabilities
X_5: Sales / Total Assets

Managerial Ownership

Managerial ownership refers to the proportion of company shares held by directors, commissioners, and executives involved in strategic decision-making [15]. Rooted in agency theory, managerial ownership addresses the inherent conflict between owners and managers, as managers may pursue personal interests that do not align with shareholder value maximization [16]. Granting managers equity stakes helps align incentives, reduces agency costs, and encourages decisions that support firm performance [1]. Prior research consistently shows that moderate levels of managerial ownership enhance corporate governance and resource efficiency. However, this relationship is not always linear, as excessively high managerial ownership can lead to managerial entrenchment, weakening oversight and potentially harming firm performance [17]. Given these dynamics, managerial ownership serves as an important governance mechanism in reducing agency conflicts, and in this study it is quantified using the following formula:

$$\text{MOS} = \frac{Managerial\ Shares}{Total\ Outstanding\ Shares}$$

2.3. Leverage

Leverage refers to the use of borrowed funds to finance corporate operations and investments, with the aim of enhancing profitability and accelerating growth by amplifying returns on equity. This strategy operates on the assumption that external financing can generate returns exceeding the cost of debt, allowing firms to expand more aggressively than relying solely on internal capital. Prior studies show that firms utilizing leverage strategically often experience improved performance, as noted by Davidsson et al. [18] and further supported by Salim & Yadav [19], who highlight the significant role of leverage in shaping firm performance. Similarly, Iqbal & Usman [20] emphasize that financial leverage can increase profitability when managed prudently, although excessive borrowing heightens financial risk and vulnerability. Leverage is commonly used to fund asset purchases, capacity expansion, and strategic investments, but it also commits firms to fixed debt obligations

regardless of financial outcomes. Excessive reliance on debt, especially under volatile revenue conditions, increases the probability of financial distress or insolvency [21]. In this study, leverage is measured using the Debt-to-Asset ratio, and the specific formula is presented as follows:

$$\text{Lev}=\frac{Total\ Debts}{Total\ Assets}$$

2.4. Profitability

Return on Assets (ROA), used as the profitability proxy in this study, reflects a company's ability to efficiently utilize its total assets to generate net income and serves as a critical indicator in financial distress research. A higher ROA signals effective resource management and strong operational efficiency, whereas a lower ROA often indicates inefficiencies, mismanagement, or adverse economic conditions. Prior research, including Arslan & Karan [22], shows that declining ROA is one of the strongest early predictors of financial distress, frequently associated with liquidity problems, reduced market confidence, and increased bankruptcy risk. Profitability metrics like ROA also form essential components of predictive frameworks such as Altman's Z-Score [14], which integrates profitability with other financial indicators to assess bankruptcy likelihood. Empirical studies, including Chen et al. [23], further highlight that firms with higher ROA demonstrate stronger resilience during economic downturns due to better internal funding capacity and operational stability. ROA also guides decision-making for investors, creditors, and regulators by identifying underperforming firms and prompting corrective strategies to mitigate risk. Given its predictive strength and relevance in financial distress analysis, ROA is included in this study's model, and its measurement is shown in the following formula:

$$\text{Return on Assets (ROA)} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

2.5. Conceptual Framework

Based on the theories previously discussed, the dependent variable in this study is Financial Distress, measured using the Altman Z-Score. The independent variables consist of Managerial Ownership, measured as the percentage of shares held by managers; Leverage, measured using the Asset-Liability Ratio; and Profitability, measured using Return on Assets (ROA). Accordingly, the conceptual framework of this research can be illustrated as follows:

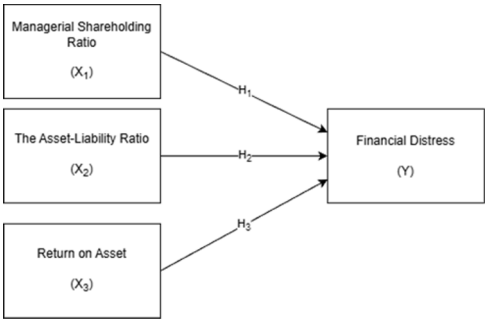


Fig 1. Table captions should be placed above the tables

2.6. Hypothesis Development

Managerial ownership is an important corporate governance mechanism that can reduce financial distress by aligning the interests of managers and shareholders and mitigating agency costs [24-27]. When managers hold equity stakes, they are incentivized to prioritize firm value over personal benefits, leading to more prudent financial policies, greater accountability, and risk-averse decision-making that lowers the likelihood of excessive leverage and risky investments. However, the relationship between managerial ownership and financial distress is non-linear, as moderate ownership levels effectively reduce distress risk, while excessively high ownership may lead to managerial entrenchment and self-serving behavior that can increase financial distress [26, 28]. Therefore, managerial ownership generally has a negative effect on financial distress, provided it is maintained at an optimal level.

H1: Managerial Ownership has negative effect on financial distress

Leverage plays a significant role in influencing financial distress, although the relationship is context-dependent and multifaceted [29]. While some studies suggest that low leverage may increase financial distress due to limited access to external financing and reduced liquidity, others find that excessive reliance on debt raises financial distress risk by increasing fixed interest obligations and constraining financial flexibility [30-32]. Firms that can strategically manage leverage and use debt to finance growth may reduce distress risk, but this benefit diminishes when debt levels become excessive and difficult to service, particularly during economic downturns. Overall, the prevailing empirical evidence indicates that higher leverage tends to increase the likelihood of

financial distress, as rising debt obligations weaken liquidity positions and heighten vulnerability to financial shocks [29-31].

H2: Leverage has positive effect on financial distress

Profitability is a key determinant of financial distress, with extensive empirical evidence showing a significant negative relationship between the two, where higher profitability reduces the likelihood of financial distress [14, 30, 33-36]. Commonly measured using Return on Assets (ROA), profitability reflects a firm's efficiency in generating earnings from its asset base, which strengthens internal cash flows, reduces dependence on external financing, and enhances liquidity and financial flexibility. Firms with higher ROA are better able to withstand economic shocks and meet financial obligations, making profitability an effective buffer against financial distress and a critical indicator in financial distress prediction models.

H3: Profitability has negative effect on financial distress

3 Research Methods

3.1. Operational Definition and Variable Measurement

This research involves four variables: one dependent variable, financial distress, and three independent variables: managerial ownership, leverage, and profitability. The study focuses on mining companies listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period.

3.2. Population and Sample

This study focuses its population on all mining sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2019–2023, with a total population of 63 companies. The financial statements and annual reports used in this research were obtained through the official IDX website at www.idx.co.id. From this total population, the study produced a final sample consisting of 51 companies that met the required criteria. In determining the sample, research commonly uses two approaches: probability sampling and non-probability sampling. In this study, the researcher adopted a non-probability sampling approach through purposive sampling. Purposive sampling is a method of selecting samples based on specific considerations and predetermined criteria that align with the objectives of the research. The criteria used in determining the sample for this study are as follows:

1. Mining companies listed on the IDX that published financial and annual reports consecutively for the period 2019–2023.
2. Mining companies that presented their financial and annual reports in rupiah currency during 2019–2023.
3. Mining companies that provided complete data necessary for measuring all research variables.

3.3. Data Types and Sources

This study use quantitative data from financial and annual report of energy companies from 2019-2023. Secondary data is specifically used in this study that represented by numbers. The data is taken from Indonesia Stock Exchange (IDX) and official website of the companies.

3.4. Method of Collecting Data

Data for this study were collected using a documentation method, which involved obtaining financial reports from energy companies. Supplementary information was also gathered through a literature review, consulting previous studies relevant to the current research.

3.5. Analysis Tool, Equation Model, and Hypothesis Testing

This study employs a quantitative analytical approach using statistical methods supported by data analysis software. The analytical technique used in this research is panel data regression combined with hypothesis testing.

1. Panel Data Regression

Panel data regression refers to a dataset that consists of both time series data and cross-sectional data. There are three model approaches commonly used in panel data regression, namely:
(1) the Common Effect Model (CEM),
(2) the Fixed Effect Model (FEM), and
(3) the Random Effect Model (REM).

These three models are further evaluated using the Chow Test and the Hausman Test to determine the most appropriate model for the analysis.

2. Equation Model

The equation model used in this research based on Yudaruddin [37] as follows:

$$\mathbf{Y} = \boldsymbol{\alpha} + \boldsymbol{\beta 1 X 1} + \boldsymbol{\beta 2 X 2} + \ldots + \boldsymbol{\beta n X n} + \boldsymbol{e} \quad \text{......} \quad \mathbf{1}$$

3.6. Hypothesis Testing

This hypothesis is tested using the F and T tests. In statistical testing, the F test indicates whether all independent variables included in the model simultaneously have an effect on the dependent variable. Assuming that other independent variables are constant, the T test presents the impact of each independent variable on the dependent variable individually. In the study conducted by the author, the significance level is set at 5% (0.05). A value indicating (sig.) < 0.05 is considered that H1 is accepted, meaning there is an influence of the independent variable on the dependent variable, whereas if the value indicates (sig.) > 0.05, H0 is accepted, meaning there is no influence of the independent variable on the dependent variable.

4 Result And Dıscussıon

4.1. Descriptive Statistic

Table 1. Descriptive Statistic

	MOS	LEV	ROA	ZSCORE
Mean	0.072000	0.188667	0.059843	4.136784
Median	0.000000	0.140000	0.040000	2.650000
Maximum	0.960000	1.070000	2.380000	84.42000
Minimum	0.000000	0.000000	-1.570000	-14.19000
Std. Dev.	0.193438	0.192136	0.227077	7.236767

Source: Data Processed (output EViews 12), 2025

Based on Table 1, the descriptive statistics of the 125 observations show substantial variability across the variables. Managerial Ownership (MOS) has an average of 0.072000 with a standard deviation of 0.193438, indicating a wide dispersion. Leverage (LEV) averages 0.188667 with a standard deviation of 0.192136, reflecting differing debt levels among firms. Profitability (ROA) has an average of 0.059843 and a standard deviation of 0.227077, showing that some firms incur losses while others achieve high returns. Financial Distress (Z-Score) exhibits the greatest variability, with an average of 4.136784 and a standard deviation of 7.236767, highlighting significant differences in financial health across the sample, from distressed to very strong firms.

4.2. Model Selection

Table 2. Chow Test Result

Redundant Fixed Effects Tests
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.076855	(50,201)	0.0000
Cross-section Chi-square	234.840227	50	0.0000

Source: Processed Data by Author (output EViews 12). 2025

Table 3. Hausman Test Result

Correlated Random Effects - Hausman Test
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.119422	3	0.7724

Source: Processed Data by Author (output EViews 12). 2025

The Chow Test results show a Cross-section F probability of 0.0000, below 0.05, indicating that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model (CEM) because companies exhibit unique characteristics affecting financial distress. The Hausman Test, however, shows a probability of 0.7724, suggesting the Random Effect Model (REM) is statistically suitable. Therefore, REM is chosen for this atudy.

4.3. Classic Assumption Test

Table 4. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.403211	2.240836	NA
MOS	4.868516	1.148709	1.008447
LEV	5.086730	2.045760	1.039509
ROA	3.622178	1.106007	1.033916

Source: Processed Data by Author (output EViews 12). 2025

The multicollinearity test using the Variance Inflation Factor (VIF) shows that MOS, LEV, and ROA have VIF values of 1.008, 1.039, and 1.034, respectively, all well below the threshold of 10. This indicates that multicollinearity is not present in the model, each independent variable provides distinct information, and the regression coefficients are stable, making the interpretation of their effects on the dependent variable statistically reliable.

4.4. Regression Result and Hypothesis Testing

Table 5. Panel Data Regression Analysis Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.933073	0.964851	6.149213	0.0000
X1_MOS	0.663424	3.763622	0.176273	0.8602
X2_LEV	-10.90027	2.835318	-3.844463	0.0002
X3_ROA	3.550328	1.595985	2.224538	0.0270
	Effects Specification			
			S.D.	Rho
Cross-section random			4.977319	0.5206
Idiosyncratic random			4.776284	0.4794
	Weighted Statistics			
R-squared	0.082369			
Adjusted R-squared	0.071402			
S.E. of regression	4.758357			
F-statistic	7.510170			
Prob(F-statistic)	0.000078			

Source: Data Processed (output EViews 12), 2025

Table 5 presents the Random Effect Model (REM) regression results examining the effect of Managerial Ownership (MOS), Leverage (LEV), and Return on Assets (ROA) on financial distress, measured using the Altman Z-Score, where a higher score indicates better financial condition and lower distress risk. The model is statistically significant overall, as indicated by the F-statistic ($F = 7.51$, $p = 0.0001$), suggesting that the independent variables jointly influence financial distress. However, the explanatory power of the model is relatively modest, with an R^2 value of 0.082, indicating that approximately 8.2% of the variation in the Z-Score is explained by the model.

Individually, managerial ownership (MOS) does not have a significant effect on financial distress ($t = 0.18$, $p = 0.860$), suggesting that variations in managerial shareholding do not materially influence the financial health of mining companies. In contrast, leverage (LEV) has a statistically significant negative effect on the Z-Score ($t = -3.84$, $p = 0.0002$), indicating that higher leverage is associated with increased financial distress. Meanwhile, profitability, measured by Return on Assets (ROA), shows a statistically significant positive effect

on the Z-Score (t = 2.22, p = 0.027), implying that more profitable firms exhibit stronger financial conditions and a lower likelihood of financial distress. The estimated regression model is expressed as follows:

$$\boldsymbol{ZSCORE = 5.93307342784 + 0.663424MOS - 10.900274LEV + 3.5503279ROA + [CX = R]} \quad \textbf{.....2}$$

It is important to emphasize that because the Altman Z-Score is inversely related to financial distress, a negative coefficient reflects a higher distress risk, while a positive coefficient indicates improved financial stability and reduced distress probability. Thus, the hypothesis testing table is obtained

Table 6. Hypothesis Testing Result

Hypothesis	Statement	Result
Hypothesis 1	Managerial Ownership has a negative effect on Financial Distress	Rejected
Hypothesis 2	Leverage has a positive effect on Financial Distress	Accepted
Hypothesis 3	Profitability has a negative effect on Financial Distress	Accepted

4.5. Discussion

4.5.1. Managerial Ownership on Financial Distress

The regression results indicate that managerial ownership does not have a statistically significant effect on financial distress among Indonesian mining companies. From an agency theory perspective, the incentive alignment effect of managerial ownership depends on whether ownership levels are sufficient to meaningfully alter managerial behavior [1]. In this study, the average managerial ownership is relatively low at 7.2 percent, suggesting that managers generally retain decision-making authority without bearing substantial residual risk, thereby weakening the expected governance effect on financial stability.

The insignificance of managerial ownership is further explained by the highly skewed ownership distribution within the sample. While the mean level of managerial ownership is low, the maximum value reaches 96 percent, indicating extreme ownership concentration in a small number of firms. This heterogeneity implies that a linear specification captures only an average effect, potentially masking nonlinear or firm-specific governance dynamics. Moreover, the estimated coefficient of managerial ownership is economically small, indicating that changes in managerial shareholding have a limited impact on the Altman Z-Score.

In addition, financial distress indicators exhibit substantial dispersion, with Z-Scores ranging from −14.19 to 84.42, reflecting high variability across firms and periods. Such volatility suggests that financial outcomes in the mining sector are primarily driven by external factors, including commodity price fluctuations, leverage exposure, and macroeconomic shocks, rather than internal ownership structures. During the observation period, which includes the COVID-19 pandemic and post-pandemic commodity cycles, these external pressures likely dominated managerial influence, further limiting the effectiveness of managerial ownership in reducing financial distress. This finding is consistent with Gerged et al. [27], who report that ownership structure alone is insufficient to mitigate distress risk in volatile and capital-intensive industries.

4.5.2. Leverage on Financial Distress

The regression results indicate that leverage has a statistically significant negative effect on the Altman Z-Score, implying that higher debt levels are associated with increased financial distress. Within the financial distress framework, leverage directly increases a firm's fixed financial obligations, reducing its capacity to absorb earnings volatility and increasing the likelihood of liquidity shortfalls. As debt levels rise, firms become more sensitive to adverse changes in operating performance, which accelerates the deterioration of financial health.

The estimated coefficient of leverage is economically meaningful, suggesting that increases in debt intensity result in a substantial decline in firms' financial condition rather than a marginal effect. This finding indicates that leverage plays a dominant role in shaping distress risk among mining companies, where cash flows are highly volatile and strongly influenced by commodity price fluctuations. Under such conditions, high leverage magnifies downside risk by constraining financial flexibility and increasing dependence on stable revenue streams that are difficult to maintain in the mining sector.

The significance and magnitude of the leverage effect reflect the structural characteristics of Indonesian mining firms, which rely heavily on external financing to support capital-intensive operations and long investment horizons. When revenue conditions deteriorate, the burden of debt servicing becomes a critical driver of financial distress. Although some studies suggest that limited access to debt may restrict operational capacity, the results of this study indicate that, within the observed context, higher leverage substantially increases financial vulnerability. This finding is consistent with prior financial distress literature emphasizing leverage as a key determinant of firm failure risk.

4.5.3. Profitability on Financial Distress

The regression results indicate that profitability, measured by Return on Assets (ROA), has a statistically significant positive effect on the Altman Z-Score, implying that more profitable firms face a lower risk of financial distress. Within the financial distress framework, profitability enhances a firm's internal financing capacity, allowing it to meet operational and financial obligations without excessive reliance on external debt. Higher profitability therefore strengthens liquidity and cushions firms against earnings volatility, reducing the likelihood of distress.

The estimated coefficient of ROA is economically meaningful, suggesting that improvements in operating performance lead to a substantive enhancement of financial condition rather than a marginal effect. This indicates that profitability plays a central role in determining financial resilience, particularly in capital-intensive industries such as mining, where firms must sustain large fixed costs and long-term investments. Firms with stronger profitability are better positioned to absorb adverse shocks, maintain debt-servicing capacity, and preserve financial stability.

The significance and magnitude of the profitability effect underscore its importance as a key determinant of financial distress. In the context of Indonesian mining companies, where revenue streams are exposed to commodity price fluctuations, sustained profitability functions as a critical buffer against financial deterioration. This finding is consistent with prior financial distress literature, which emphasizes profitability as one of the most reliable indicators of a firm's ability to avoid distress and maintain long-term sustainability.

5 Closure

5.1. Conclusion

This study examines the role of managerial ownership, leverage, and profitability in explaining financial distress among mining companies listed on the Indonesia Stock Exchange. The findings indicate that financial distress in the mining sector is primarily driven by firms' financial structure and operational performance rather than by ownership-based governance mechanisms. While agency theory suggests that managerial ownership can reduce financial risk through incentive alignment, the results show that this mechanism is ineffective in practice when ownership levels are low and financial outcomes are dominated by external and structural pressures.

Leverage emerges as a key determinant of financial distress, highlighting the vulnerability of capital-intensive mining firms to debt-related risk. This finding underscores that, in industries characterized by high fixed costs and volatile revenues, excessive reliance on debt magnifies exposure to economic shocks and constrains firms' ability to absorb downturns. Profitability, on the other hand, plays a stabilizing role by strengthening internal financing capacity and reducing dependence on external funds, thereby enhancing resilience against financial distress.

From a theoretical perspective, this study contributes to the financial distress and agency literature by demonstrating that governance mechanisms such as managerial ownership may have limited effectiveness in volatile and asset-heavy industries, where financial and market factors exert stronger influence on firm survival. This suggests that the impact of agency-based governance is conditional on industry characteristics and economic context.

Practically, the results imply that risk management in Indonesian mining companies should prioritize capital structure discipline and sustainable operating performance rather than relying on ownership incentives to mitigate distress risk. Given the sector's exposure to commodity price cycles and regulatory uncertainty, maintaining prudent leverage levels and consistent profitability is critical for preserving financial stability. Overall, this study emphasizes that, in the mining industry, financial resilience is shaped more by how firms manage debt and earnings capacity than by internal ownership structures.

5.2. Suggestion

Based on the research results and conclusions obtained, the suggestions that can be given are as follows:

1. For companies, it is recommended to pay closer attention to their leverage levels. The results show that high leverage significantly increases the likelihood of financial distress. Therefore, companies should maintain an optimal balance between debt and equity to ensure financial stability and minimize the risk of financial difficulties. Prudent debt management is essential to avoid excessive financial pressure that could harm long-term performance.
2. Companies should continue to enhance profitability through efficiency improvements, cost control, and innovation in operations. Since profitability has been proven to significantly reduce the probability of financial distress, maintaining consistent profit growth will strengthen financial resilience and improve investor confidence in the company's long-term sustainability.
3. Although managerial ownership shows no significant effect on financial distress, companies can still consider increasing the proportion of managerial shareholding to encourage stronger alignment between

management and shareholder interests. This step can potentially improve decision-making quality and reduce opportunistic behavior in the future.

4. For future research, it is recommended to include additional variables such as liquidity, firm size, and corporate governance mechanisms to provide a broader perspective on the determinants of financial distress. Expanding the research scope to different sectors or longer observation periods could also enhance comparative understanding and strengthen the generalizability of the findings.

References

1. C. Jensen and H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," vol. 3, pp. 305–360, 1976, doi: https://doi.org/10.1016/0304-405X(76)90026-X.
2. R. Morck, A. Shleifer, and R. W. Vishny, "Management ownership and market valuation. An empirical analysis," *J. financ. econ.*, vol. 20, no. C, pp. 293–315, 1988, doi: 10.1016/0304-405X(88)90048-7.
3. M. Boshkoska, "The Agency Problem: Measures for Its Overcoming," *Int. J. Bus. Manag.*, vol. 10, no. 1, 2014, doi: 10.5539/ijbm.v10n1p204.
4. M. C. Jensen, "Journal of Social and Personal," *J. Soc. Pers. Relatsh.*, vol. 15, no. 6, pp. 755–773, 1986.
5. C. W. Smith and J. B. Warner, "On financial contracting. An analysis of bond covenants," *J. financ. econ.*, vol. 7, no. 2, pp. 117–161, 1979, doi: 10.1016/0304-405X(79)90011-4.
6. A. Shleifer and R. W. Vishny, "A Survey of Corporate Governance Andrei," *PhD Propos.*, vol. 1, no. 2, pp. 737–783, 1997.
7. C. Y. Baldwin and S. P. Mason, "The Resolution of Claims in Financial Distress the Case of Massey Ferguson," *J. Finance*, vol. 38, no. 2, pp. 505–516, 1983, doi: 10.1111/j.1540-6261.1983.tb02258.x.
8. H. D. Platt and M. B. Platt, "Predicting corporate financial distress: Reflections on choice-based sample bias," *J. Econ. Financ.*, vol. 26, no. 2, pp. 184–199, 2002, doi: 10.1007/bf02755985.
9. G. Andrade and S. N. Kaplan, "How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed," *J. Finance*, vol. 53, no. 5, pp. 1443–1493, 1998, doi: 10.1111/0022-1082.00062.
10. R. B. Whitaker, "The early stages of financial distress," *J. Econ. Financ.*, vol. 23, no. 2, pp. 123–132, 1999, doi: 10.1007/bf02745946.
11. W. H. Beaver, "Financial Ratios as Predictors of Failure," *J. Account. Res.*, vol. 4, pp. 71–111, 1966.
12. S. C. Gilson, K. John, and L. H. P. Lang, "Troubled debt restructurings. An empirical study of private reorganization of firms in default," *J. financ. econ.*, vol. 27, no. 2, pp. 315–353, 1990, doi: 10.1016/0304-405X(90)90059-9.
13. E. S. Hotchkiss, "Postbankruptcy Performance and Management Turnover," *J. Finance*, vol. 50, no. 1, pp. 3–21, 1995, doi: 10.1111/j.1540-6261.1995.tb05165.x.
14. E. I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *J. Finance*, vol. 23, no. 4, pp. 589–609, 1968, doi: 10.1111/j.1540-6261.1974.tb00057.x.
15. D. Agustia, W. Dianawati, and D. R. A. Indah, "Managerial Ownership, Corporate Social Responsibility Disclosure and Corporate Performance," *Manag. Sustain. Dev.*, vol. 10, no. 2, pp. 67–71, 2019, doi: 10.2478/msd-2019-0011.
16. R. Boubaker and J. Anis, "Managerial ownership , Debt and Dividend Policy of Tunisian Companies : Evidence of a Simultaneous Analysis," *Int. J. Econ. Strateg. Manag. Bus. Process*, vol. 10, no. January, pp. 21–30, 2017.
17. H. Demsetz, "The Structure of Ownership and the Theory of the Firm," *J. Law Econ.*, vol. 26, no. 2, pp. 375–390, 1983, doi: 10.1086/467041.
18. P. Davidsson, P. Steffens, and J. Fitzsimmons, "Growing profitable or growing from profits: Putting the horse in front of the cart?," *J. Bus. Ventur.*, vol. 24, no. 4, pp. 388–406, 2009, doi: 10.1016/j.jbusvent.2008.04.003.
19. M. Salim and R. Yadav, "Capital Structure and Firm Performance: Evidence from Malaysian Listed Companies," *Procedia - Soc. Behav. Sci.*, vol. 65, no. ICIBSoS, pp. 156–166, 2012, doi: 10.1016/j.sbspro.2012.11.105.
20. U. Iqbal and M. Usman, "Impact of Financial Leverage on Firm Performance," *SEISENSE J. Manag.*, vol. 1, no. 2, pp. 70–78, 2018, doi: 10.33215/sjom.v1i2.13.
21. O. J. Akinyomi and A. Olagunju, "Determinants of capital structure in Nigeria," *Int. J. Innov. Appl. Stud.*, vol. 3, no. 4, pp. 999–1005, 2013.
22. Ö. Arslan and M. B. Karan, "Credit risks and internationalization of SMEs," *J. Bus. Econ. Manag.*, vol. 10, no. 4, pp. 361–368, 2009, doi: 10.3846/1611-1699.2009.10.361-368.
23. J. Chen, A. De Cesari, P. Hill, and N. Ozkan, "Initial compensation contracts for new executives and financial distress risk: An empirical investigation of UK firms," *J. Corp. Financ.*, vol. 48, pp. 292–313, 2018, doi: 10.1016/j.jcorpfin.2017.11.002.
24. V. Aebi, G. Sabato, and M. Schmid, "Risk management, corporate governance, and bank performance in the

financial crisis," *J. Bank. Financ.*, vol. 36, no. 12, pp. 3213–3226, 2012, doi: 10.1016/j.jbankfin.2011.10.020.
25. C. W. Calomiris and M. Carlson, "Corporate Governance and Risk Management At Unprotected Banks :," *J. financ. econ.*, vol. 119, pp. 512–532, 2014, [Online]. Available: http://www.sciencedirect.com/science/article/pii/S0304405X16000325
26. D. Ashraf, M. Ramady, and K. Albinali, "Financial fragility of banks, ownership structure and income diversification: Empirical evidence from the GCC region," *Res. Int. Bus. Financ.*, vol. 38, pp. 56–68, 2016, doi: 10.1016/j.ribaf.2016.03.010.
27. A. M. Gerged, S. Yao, and K. Albitar, "Board composition, ownership structure and financial distress: insights from UK FTSE 350," *Corp. Gov.*, vol. 23, no. 3, pp. 628–649, 2023, doi: 10.1108/CG-02-2022-0069.
28. Y. G. Shan, I. Troshani, J. Wang, and L. Zhang, "Managerial ownership and financial distress: evidence from the Chinese stock market," *Int. J. Manag. Financ.*, vol. 20, no. 1, pp. 192–221, Jan. 2024, doi: 10.1108/IJMF-06-2022-0270.
29. S. A. Balasubramanian, G. S. Radhakrishna, P. Sridevi, and T. Natarajan, "Modeling corporate financial distress using financial and non-financial variables: The case of Indian listed companies," *Int. J. Law Manag.*, vol. 61, no. 3–4, pp. 457–484, Oct. 2019, doi: 10.1108/IJLMA-04-2018-0078.
30. K. Konstantaras and C. Siriopoulos, "Estimating financial distress with a dynamic model: Evidence from family owned enterprises in a small open economy," *J. Multinatl. Financ. Manag.*, vol. 21, no. 4, pp. 239–255, 2011, doi: 10.1016/j.mulfin.2011.04.001.
31. T. Piskorski, A. Seru, and V. Vig, "Securitization and distressed loan renegotiation: Evidence from the subprime mortgage crisis," *J. financ. econ.*, vol. 97, no. 3, pp. 369–397, 2010, doi: 10.1016/j.jfineco.2010.04.003.
32. D. Yazdanfar and P. Öhman, "Financial distress determinants among SMEs: empirical evidence from Sweden," *J. Econ. Stud.*, vol. 47, no. 3, pp. 547–560, 2020, doi: 10.1108/JES-01-2019-0030.
33. H. F. Turetsky and R. A. Mcewen, "An empirical investigation of firm longevity: A model of the Ex Ante predictors of financial distress," *Rev. Quant. Financ. Account.*, vol. 16, no. 4, pp. 323–343, 2001, doi: 10.1023/A:1011291425075.
34. S. Baños-Caballero, P. J. García-Teruel, and P. Martínez-Solano, "Working capital management, corporate performance, and financial constraints," *J. Bus. Res.*, vol. 67, no. 3, pp. 332–338, 2014, doi: 10.1016/j.jbusres.2013.01.016.
35. S. Ahmad, L. Zhang, A. Ahmad, and A. Ahmad, "Effect of financial distress on firm ' s performance of non-financial firms registered with Pakistan Stock Exchange Effect of financial distress on firm ' s performance of non -financial firms registered with Pakistan Stoke Exchange . School of Management," no. May, 2020.
36. E. Hassan, M. Awais-E-Yazdan, R. Birau, P. Wanke, and Y. A. Tan, "Predicting financial distress in non-financial sector of Pakistan using PCA and logit," *Int. J. Islam. Middle East. Financ. Manag.*, vol. 17, no. 3, pp. 485–508, 2024, doi: 10.1108/IMEFM-10-2023-0404.
37. R. Yudaruddin, *Laboratorium Statistik*. Samarinda, 2021.

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