International Journal of Economics, Accounting, and Management
Vol. 2, No. 6, March 2026
Page 407-417
E-ISSN: 3047-6798
P-ISSN: 3047-678X
Site : https://jurnal.intekom.id/index.php/ijeam

The Effect of Profitability, Liquidity, Solvability, Sales Growth And Firm Size on Financial Distress In Mining Sector Listed on The Indonesia Stock Exchange

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Article Info

Article history:

Received March 1, 2025
Revised October 20, 2025
Accepted March 29, 2026

Keywords:

Profitability,
Liquidity,
Solvency,
Sales Growth,
Firm Size

ABSTRACT

This study aims to analyze the influence of profitability, liquidity, solvency, sales growth, and firm size on potential financial distress in mining sector companies listed on the Indonesia Stock Exchange (IDX) during the 2018-2022 period. Financial distress is defined as a condition in which a company experiences financial difficulties that could potentially lead to bankruptcy if not addressed immediately. This study uses a quantitative method with secondary data obtained from the annual financial statements of mining sector companies. Financial distress was measured using the Altman Z-Score method, while data analysis was carried out by multiple linear regression. This study examines the influence of five independent variables: profitability, liquidity, solvency, sales growth, and firm size on financial distress.The conclusion of this study is that financial factors such as profitability, liquidity, solvency, and company size are important indicators in predicting potential financial distress in the mining sector. This result is expected to be a reference for company management and investors in making strategic decisions to manage financial risks and mitigate potential financial distress.

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1. INTRODUCTION

Indonesia, which has been hit by the Covid-19 pandemic, has resulted in a very significant decline in gross domestic income. As a result of these unstable economic conditions, it has an impact on the company's activities (1)(2). Companies that fail to survive in the midst of difficult economic conditions will face financial problems (financial distress) that can lead to bankruptcy. According to Jayasekera in Giovanni et al, financial distress can occur when a company suffers large losses due to debts exceeding assets which can lead to bankruptcy (3). Stated that financial distress occurs when a company fails to meet its financial obligations, which has the potential to lead to bankruptcy (4). If not managed properly, financial distress can result in the company going into liquidation or bankruptcy.

To maintain the financial stability of a company, it is important to conduct a financial analysis, where the company's financial condition is the focus of attention of various parties, such as management, investors, creditors and other related parties (5). This study discusses the prediction of bankruptcy of mining companies listed on the IDX, related to the phenomenon that occurs in the mining sector. The phenomenon that occurred was when the Covid-19 pandemic had a significant impact on Indonesia's mining sector, especially in the coal industry. Reporting from in 2020 national coal production decreased by around 11%. This decline was caused by reduced global demand due to weakening economic activity, falling coal prices, and limited employee mobility and logistics of mining companies during the pandemic (6)(7).

Some mining companies that produce low-quality coal even stop production because their operational costs are higher than the prevailing selling price in the market. Especially for some mining companies that do not have long-term contracts, the most affected by the pandemic situation because they rely on the export market (8). Many mining companies in Indonesia have suffered large losses due to the Covid-19 pandemic, PT Bumi Resources Tbk (BUMI) is a coal company that has experienced a significant impact where it experienced a 5% decrease in sales volume and recorded a loss of US$137.25 million in 2020 compared to before the pandemic (9).

Several factors that affect financial distress are evident in the company's financial statements. A company's financial performance is evaluated through the use of financial ratio analysis (10). The effectiveness of the company's operational activities and its capacity to generate profits over a certain period of time is assessed through the measurement of profitability, which is obtained from the amount generated from sales and investments (11).

In Lau, in the field of financial analysis, liquidity indicates a company's ability to handle direct financial responsibility. This metric evaluates how quickly a business can convert its assets into cash to pay off short-term debt before it matures. The key to maintaining strong liquidity is to have a sizable cash reserve or current asset that can be quickly converted into funds (12). Corporate solvency is a metric that assesses an organization's capacity to meet long-term obligations. A company cannot be said to be solvable if its total debt exceeds its total assets (13).

According to Almilia and Kristijadi in Trisanti, sales growth reflects the company's sales growth rate in a period. When sales growth increases, the company's profits will also rise, which will bring stability to the company and prevent it from financial crises (14). The size of a company's assets is determined by its scale. Total assets or the number of transactions generated during a given period can be used to determine the size of the company. Compared to smaller companies, large companies are considered much more resilient to financial distress due to their large total assets (15).

2. METHOD

The research model that will be examined in this study as follows:

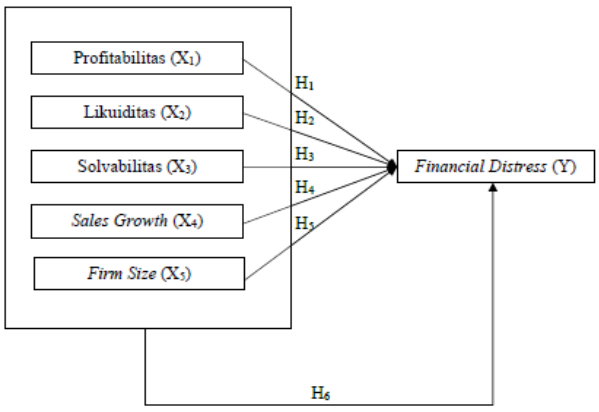

Figure 1. Model Penelitian

H1 : Profitability influences financial distress
H2 : Liquidity influences financial distress
H3 : Solvency influences financial distress
H4 : Sales growth influences financial distress
H5 : Firm size influences financial distress

This study uses a quantitative research method. Quantitative research is the collection and evaluation of data that can be measured using statistical or mathematical methods. This study was conducted to determine the influence of profitability, liquidity, solvency, sales growth, and firm size on financial distress in mining companies listed on the Indonesia Stock Exchange.

The population in this study is mining companies listed on the Indonesia Stock Exchange for the period 2018 – 2022. The total population of mining companies listed on the Indonesia Stock Exchange is 42 companies. The method used in this study is purposive sampling, a data collection technique with certain criteria.

3. RESULTS AND DISCUSSION

The mining sector in Indonesia is one of the strategic sectors that has an important role in supporting the national economy. As a major contributor to the country's foreign exchange through exports, the sector also provides vital raw materials for various industries such as energy, construction, and manufacturing. Mining companies listed on the Indonesia Stock Exchange (IDX) cover a diverse range of subsectors, including coal mines, metallic minerals such as copper, nickel, and gold, and non-metallic minerals. The diversity of these subsectors reflects the complexity and dynamics of the mining sector which is influenced by many factors, both internal and external.

The research focused on mining companies listed on the Indonesia Stock Exchange (IDX) between 2018 and 2022, covering a total of 42 companies in the coal, metals, and non-metallic minerals subsectors. The study used 210 annual observations sourced from the S&P Capital IQ database. The strategically selected time frame was chosen to capture significant global economic events, including U.S.-China trade tensions and the COVID-19 pandemic, which had a substantial impact on the performance of the mining sector.

3.1. Independent and Dependent Variable

Independent variables are variables that do not depend on other factors, but will affect other variables. The independent variables in this study are profitability, liquidity, solvency, sales growth and firm size. Dependent variables are variables that will be affected by other factors. This study uses financial distress as a dependent variable.

3.1.1. Profitability

Sartono in [16] states that profitability shows the ability of a company to generate profits from the assets used. Profitability analysis provides information to support a company's capacity to generate profits and the effectiveness of its management. For a company, profit is one of the most important elements to develop its business. In measuring profitability in this study, using (ROA) is a financial ratio used to measure how effectively a company uses its assets to generate profits. ROA indicates management efficiency in managing the company's resources to maximize profits. The following formula (ROA) (Prayuningsih et al., 2021) [23]:

$$ROA = (Net\ Income)/(Total\ Assets)$$

3.1.2. Liquidity

Liquidity is the ability of a company to meet its short-term financial obligations using its assets, especially current assets such as cash or receivables. In general, liquidity indicates how quickly and easily an asset can be converted into cash without experiencing a significant decline in value [22]. The following is the CR formula:

$$CR = (\text{Current Assets})/(\text{Current Liabilities})$$

3.1.3. Solvency

According to, the ability of a company to meet its obligations or debts in the long term. In other words, solvency measures whether a company has enough assets to cover all of its long-term liabilities if needed. This is important because solvency describes a company's financial resilience in the face of long-term liabilities and is an important indicator of a company's financial health. Here's the formula for DER [25] :

$$DER = (\text{Total Liabilities})/(\text{Total Equity})$$

3.1.4. Sales Growth

An increase in sales achieved by a company over a period of time. This is one of the key indicators in assessing the operational performance and success of the company's marketing strategy. Sales Growth is important because it reflects how well a company increases revenue from the sale of its products or services. The following is the formula for the Sales Growth Rate [14]:

$$\text{Sales Growth} = (\text{Sales periode t-Sales periode (t-1)})/(\text{Sales Periode (t-1)})$$

3.1.5. Firm Size

Large companies with large assets or high market capitalization are usually better able to survive in financial distress than small companies. The large size of the company signals that the company has more resources to survive and get better access in terms of funding or debt restructuring than a small company with more limited resources. An indicator used to measure the size or scale of a company. Here's the firm size formula:

$$\text{Firm Size (Total Assets)} = \ln(\text{Total Assets})$$

3.1.6. Financial Distress

Financial Distress or financial distress is a condition in which a company experiences significant financial difficulties which means that it cannot meet its financial obligations on time. The company does not have enough cash or liquidity to meet short-term obligations such as debt payments and/or employee salaries. Another cause of financial distress according to Brigham and Daves in, is that there is inaccuracy in decision-making made by company management or lack of observation of financial conditions that result in a lack of company funds.

$$Z' = 6{,}56\ X1 + 3{,}26\ X2 + 6{,}72\ X3 + 1{,}05\ X4$$

3.2. Analysis Result

3.2.1. Descriptive Statistics

Descriptive statistics is a concise approach to data collection that is used to simplify, summarize, and organize data to facilitate its understanding.

Table 1. Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Profitabilitas	210	-1.60	.60	.0519	.18720
Likuiditas	210	.10	10.10	1.7290	1.63861
Solvabilitas	210	-18.80	34.10	1.2976	3.75062
SalesGrowth	210	-1.00	67.10	.7090	4.77749
FirmSize	210	11.00	18.90	15.6024	1.64966
AltmanZScore	210	-22.50	3716.30	25.7038	261.58746
Valid N (listwise)	210				

Sumber: Data diolah oleh Penulis (2024)

The data shows that there is a large variability in the financial condition of companies in the Indonesian mining sector. Some companies have healthy financial conditions (profitability, high liquidity, and large financial distress), but others face significant financial risks (low liquidity, negative solvency, low financial distress). Factors such as debt, sales growth, and firm size are elements that affect the financial stability of this sector.

3.2.2. Normality Test

Normality testing is a critical phase of data analysis, as it guarantees that the data under investigation is distributed normally or follows a certain distribution pattern.

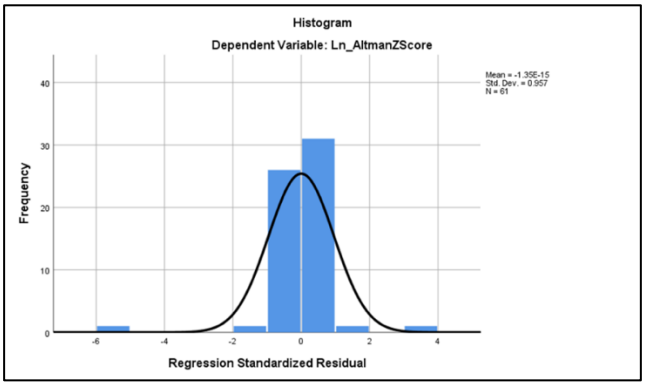

Figure 2. Histogram

This suggests that the regression model most likely meets the assumption of residual normality. The residual mean is -1.35E-15, close to zero, which indicates there is no systematic bias in the residual. The standard residual deviation is 0.957, which indicates that the residual variation is relatively small.

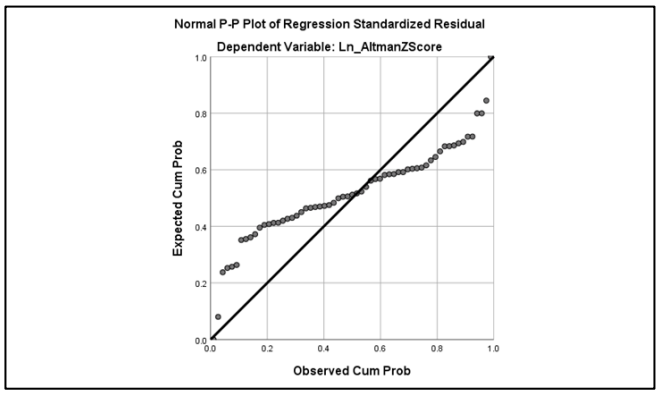

Figure 3. P-Plot

Most of the points on the chart follow a diagonal line, which indicates that the residual distribution is close to the normal distribution. However, there were slight deviations at some points at the beginning (near 0.2) and the end (near 0.8–1.0). Although there are minor deviations, the overall pattern supports the assumption of normality. To ensure that the assumption of normality is actually met, additional statistical tests such as Kolmogorov-Smirnov are needed.

Table 2. One-Sample Kolmogorov Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		147
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.01816503
Most Extreme Differences	Absolute	.180
	Positive	.180
	Negative	-.127
Test Statistic		.180
Asymp. Sig. (2-tailed)		.000[c]

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Sumber: Data diolah Penulis (2024)

The results of UjicdKolmogorov-SmirnovsSatuxsSampelab show that the residual distribution of the regression model fails to meet the assumption of normality. This conclusion was drawn from the test statistical value of 0.180 and the significance value of 0.000, which is below the set significance level of 0.05. Thus, the null hypothesis (H0) stating that the residual distribution is normal is rejected. In addition, the residual mean value is 0.000, indicating a centralized error at zero, but the standard deviation is quite large, which is 2.018, which indicates a significant residual spread. Abnormal results can be due to the fact that the mining industry is greatly influenced by external factors such as global commodity prices, government policies, and currency exchange rate fluctuations. This can lead to extreme variability in a company's performance over a given number of years, making it more difficult for data to keep up with normal distributions.

3.2.3. Multicollinearity Test

Multicollinearity tests are performed to detect the potential for high correlation among independent variables in regression models, which can compromise the stability and accuracy of coefficient estimation. VIF is used to measure the extent to which an independent variable can be explained by another independent variable in the model.

Table 3. Multicollinearity Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics	
		B	Std. Error	Beta	Tolerance	VIF
1	(Constant)	-2.358	1.779			
	Profitabilitas	11.050	2.030	.306	.727	1.376
	Likuiditas	1.797	.221	.421	.856	1.168
	Solvabilitas	-.944	.130	-.370	.881	1.136
	SalesGrowth	.130	.258	.025	.944	1.059
	FirmSize	.217	.114	.097	.878	1.139

a. Dependent Variable: AltmanZScore

Sumber: Data diolah Penulis (2024)

In the absence of multicollinearity in the model, the estimation of the regression coefficient can be interpreted accurately without bias caused by the high correlation between independent variables.

Regression models show strong internal validity in explaining how each variable affects financial hardship. Liquidity and Profitability emerged as the most significant positive contributors to financial stability. In contrast, Solvency shows a negative association with financial hardship, which suggests that higher levels of solvency correspond to a lower likelihood of experiencing financial challenges.

3.2.4. Heteroscedasticity Test

The heteroscedasticity test using the Glejser test aims to test whether there is a pattern of deviation (residual) that is not constant (heteroscedasticity) in the regression model. This test was carried out by testing the relationship between independent variables and absolute residual values. If the test results show that the independent variable has an influence on the residual, then it can be concluded that there is a problem of heteroscedasticity.

Table 4. Heteroscedasticity Test

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5.018	1.434		3.498	.001
	Profitabilitas	.572	1.637	.033	.350	.727
	Likuiditas	-.296	.178	-.146	-1.661	.099
	Solvabilitas	-.067	.105	-.055	-.639	.524
	SalesGrowth	.094	.208	.038	.451	.653
	FirmSize	-.219	.092	-.206	-2.377	.019

a. Dependent Variable: ABS_RES

Sumber: Data diolah Penulis (2024)

Overall, the results of the Glejser test show that Firm Size is the only variable that shows a significant influence on residuals, signaling the existence of heteroscedasticity problems in the model. The other variables showed no effect on the residuals, indicating that the model did not experience serious heteroscedasticity due to these variables.

3.2.5. Autocorrelation Test

Durbin-Watson is used to detect the existence of autocorrelation in the residual regression model, that is, whether the residual value in the previous period affects the residual value in the next period.

Table 5. Autocorrelation Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.823[a]	.677	.665	2.05364	2.044

a. Predictors: (Constant), FirmSize, SalesGrowth, Solvabilitas, Likuiditas, Profitabilitas

b. Dependent Variable: AltmanZScore

Sumber: Data diolah Penulis (2024)

In this case, a Durbin-Watson value = 2.044 indicates that there are no significant autocorrelation issues in this model. This value is close to 2, which indicates that the residual regression models are not significantly correlated with each other, and thus, the assumption of autocorrelation can be considered fulfilled. In other words, this regression model does not show any repetitive residual patterns, making it valid for further analysis.

3.2.6. Multiple Linear Regression Test

Multiple linear regression analysis aims to explore the interrelated relationships between multiple independent variables and dependent variables in a single model. In this particular study, five independent variables—Profitability, Liquidity, Solvency, Sales Growth, and Company Size—were

examined in relation to Financial Hardship, which serves as a measure of a company's financial stability.

Table 6. Multiple Linear Regression Test

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-2.358	1.779		-1.326	.187		
	Profitabilitas	11.050	2.030	.306	5.442	.000	.727	1.376
	Likuiditas	1.797	.221	.421	8.139	.000	.856	1.168
	Solvabilitas	-.944	.130	-.370	-7.242	.000	.881	1.136
	SalesGrowth	.130	.258	.025	.503	.616	.944	1.059
	FirmSize	.217	.114	.097	1.903	.059	.878	1.139

a. Dependent Variable: AltmanZScore

Sumber: Data diolah Penulis (2024)

The results of this multiple linear regression test show the relationship between several independent variables (Profitability, Liquidity, Solvency, SalesGrowth, and FirmSize) and the dependent variables of Financial Distress.

3.2.7. Simultaneous Test (Test F)

The F test is a statistical technique used to evaluate the comprehensive significance of a regression model. In linear regression analysis, this test determines the collective ability of independent variables to account for the variation of dependent variables.

Table 7. Simultaneous Test (F-Test)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.270	5	4.854	15.672	.000[b]
	Residual	17.034	55	.310		
	Total	41.304	60			

a. Dependent Variable: Ln_AltmanZScore

b. Predictors: (Constant), Ln_FirmSize, Ln_Profitabilitas, Ln_SalesGrowth, Ln_Solvabilitas, Ln_Likuiditas

Sumber: Data diolah Penulis (2024)

The results of the F test in this regression analysis show that the regression model as a whole is significant in predicting the dependent variable, namely Financial Distress. The value of F = 15.672 indicates that the model has a strong ability to explain variation9 in Financial Distress, compared to the variation that cannot be explained by the model (residual). In addition, a p-value = 0.000 indicates that the 7model6 regression is statistically significant, as the p-value is greater than 0.05. In other words, the independent variables tested (FirmSize, Profitability, SalesGrowth, Solvency, and Liquidity) together have a significant effect9 on Financial Distress. This indicates that these factors can collectively explain the variation in a company's financial stability as measured by Financial Distress

3.2.8. Partial Test (T-Test)

The partial t-test is a statistical method designed to assess the individual impact of each independent variable on an independent variable, while keeping all variables at a constant level.

Table 8. Partial Test (T-Test)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-2.358	1.779		-1.326	.187		
	Profitabilitas	11.050	2.030	.306	5.442	.000	.727	1.376
	Likuiditas	1.797	.221	.421	8.139	.000	.856	1.168
	Solvabilitas	-.944	.130	-.370	-7.242	.000	.881	1.136
	SalesGrowth	.130	.258	.025	.503	.616	.944	1.059
	FirmSize	.217	.114	.097	1.903	.059	.878	1.139

a. Dependent Variable: AltmanZScore

Sumber: Data diolah Penulis (2024)

The comprehensive analysis shows that Profitability, Liquidity, and Solvency have a substantial impact on financial hardship, while Sales Growth and Company Size fail to show a statistically significant influence at a significance level of 5%.

3.2.9. Test Coefficient of Determination (R^2)

Table 9. Coefficient of Determination Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.590[a]	.348	.260	.46681

a. Predictors: (Constant), LN_FirmSize, LN_SalesGrowth, LN_Profitabilitas, LN_Solvabilitas, LN_Likuiditas

Sumber: Data diolah Penulis (2024)

The determination coefficient (R2) test revealed that the independent variable accounted for 26% of the variation of the bound variable, while the remaining 74% was caused by external factors that were not taken into account in the regression model.

3.3. Discussion

3.3.1. The Effect of Profitability on Financial Distress in Mining Companies

The results of this study are in line with research conducted by [5] that profitability has an impact on financial distress. This means that companies with higher profitability have a lower risk of financial distress. Companies with high profitability tend to have stable operating cash flow, allowing them to meet financial obligations such as debt payments and operating expenses. On the contrary, low profitability increases the risk of financial distress because the company is unable to generate enough profit to cover the high fixed costs in the mining sector [21].

3.3.2. The Effect of Liquidity on Financial Distress in Mining Companies

The results of this study are in line with research conducted by Syuhada et al, 2020 where liquidity has an impact on financial distress. This means that the higher the company's liquidity, the less risk of financial distress. A company's ability to meet its short-term obligations is crucial in dealing with earnings volatility due to fluctuations in global commodity prices. High liquidity reflects the adequacy of current assets to pay operational obligations, thereby reducing financial pressures. In the mining sector that requires large working capital, liquidity helps ensure smooth operations, especially when revenues are disrupted by declining commodity prices or other external challenges. Conversely, low liquidity increases the risk of default on short-term liabilities, which can trigger financial distress.

3.3.3. The Effect of Solvency on Financial Distress in Mining Companies

The results of this study are in accordance with research conducted by Syuhada et al., 2020 which states that solvency has an impact on financial distress. The high dependence of mining companies on debt-based financing for long-term operations and investments. A high DER increases interest expenses and payment obligations, especially when a company's earnings are affected by fluctuations in global commodity prices. Mining companies with good solvency (low DERs) are better able to maintain financial stability because they have the flexibility to manage debt and maintain operations in uncertain market conditions. On the other hand, a capital structure that is too dependent on debt can exacerbate the risk of bankruptcy.

3.3.4. The Effect of Sales Growth on Financial Distress in Mining Companies

The results of this study are in accordance with research conducted by Syuhada et al., 2020 which states that sales growth has no impact on financial distress. This is because the mining sector is more influenced by fluctuations in global commodity prices than sales volume. In the mining industry, a company's revenue depends more on international market prices for commodities such as coal, gold, and nickel. Even if sales volumes increase, a decline in commodity prices can lead to low incomes and increase the risk of financial distress. In addition, high operational costs in the mining sector can reduce the positive impact of sales growth on the company's financial stability.

3.3.5. The Effect of Firm Size on Financial Distress in Mining Companies

The results of this study are in line with research conducted by Syuhada et al., 2020 which shows firm size has no impact on financial distress. Firm size did not have a significant influence on financial distress in the mining sector during the 2018–2022 period due to the specific characteristics of this industry. In the mining sector, the company's financial condition is more influenced by external factors such as fluctuations in global commodity prices, government policies, and international market dynamics compared to the size of the company. Although large companies have more resources, they also face complex challenges, such as high operating costs and dependence on export markets, which can make them vulnerable to financial distress if revenues fall [9].

4. CONCLUSION

Based on the results of data analysis and discussions conducted in this study regarding the influence of profitability, liquidity, solvency, sales growth, and firm size on financial distress in mining sector companies listed on the Indonesia Stock Exchange (IDX) for the 2018-2022 period, it can be concluded as follows:

1. Profitability has a positive and significant influence on financial distress. This shows that companies that are able to generate profits efficiently have a lower risk of financial distress. High profitability provides financial stability, especially in the face of market pressures.
2. Liquidity has a positive and significant influence on financial distress. Companies with adequate liquidity can better meet their short-term obligations, thereby reducing the risk of financial difficulties.
3. Solvency has a negative and significant influence on financial distress. High levels of debt relative to equity increase the risk of financial distress, while companies with controlled debt tend to have healthier capital structures.
4. Sales Growth has no effect on financial distress. Although sales growth is an important indicator of operational performance, external factors such as fluctuations in commodity prices and government policies are more dominant in determining the financial condition of the mining sector.

5. Firm Size has no effect on financial distress. The size of the company, whether large or small, does not guarantee financial stability. Instead, effective and efficient resource management is the main determining factor.

The results of this study emphasize the importance of strategic financial management in managing profitability, liquidity, and solvency to prevent financial distress, especially in the mining sector which is highly dependent on global market conditions

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