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QUANTITATIVE ANALYSIS OF FINANCIAL DISTRESS DETERMINANTS WITH PROFITABILITY AS A MODERATOR IN MINING SECTOR ISSUERS

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ABSTRACT
This study aims to analyse the determinants of financial distress in mining companies listed on the Indonesia Stock Exchange (IDX) for the period 2020–2024, with profitability as a moderating variable in the relationship between leverage, liquidity, operational capacity, sales growth, and company size. The study uses a quantitative approach with Moderate Regression Analysis (MRA) on secondary data from the financial reports of 24 mining companies selected through purposive sampling. The results show that leverage, liquidity, and operational capacity have a significant effect on financial distress, while sales growth and company size have no significant effect. Profitability is proven to significantly moderate only the relationship between liquidity and financial distress. These findings have practical implications for company management and investors as a basis for decision-making in managing financial risk and assessing the health of mining companies amid economic and political uncertainty. The novelty of this study lies in the use of profitability as a moderating variable and the analysis period covering the latest year of 2024, which is marked by various economic and political issues affecting the mining sector.

Keywords: Financial Distress, Financial Ratio, Profitability, Mining

INTRODUCTION

The mining sector in Indonesia plays an important role in the national economy, being one of the largest contributors to the country's economy and national development (Wartono, Maichal, & Apriyanto, 2024). However, the characteristics of this industry make it highly vulnerable to global commodity price fluctuations, changes in government policy, and high operational risks. Dependence on export commodities such as coal, nickel, and gold makes mining companies in Indonesia susceptible to financial distress, especially when there is a decline in international commodity prices or changes in domestic regulations.

A company is said to be experiencing financial difficulties when it is no longer able to meet its financial obligations, particularly short-term debt (liquidity) and long-term debt (solvency) (Burnika, Pahala, & Handarini, 2024). Financial distress occurs when a company's financial health deteriorates due to a decline in revenue, resulting in losses. As a result, the company struggles to cover its expenses, further worsening its financial condition. Therefore, identifying the factors that cause financial distress is important as an effort to mitigate financial risk and maintain business continuity.

Various internal factors within a company have been identified as determinants of financial distress. Several previous studies have stated that financial ratios such as liquidity, leverage, company size, operational capacity, and sales growth are important indicators in predicting financial difficulties (Widhiastuti & Pradnyani, 2024). Companies with high debt levels (high leverage), low ability to pay short-term obligations (low liquidity), and small company size, low operational capacity, and stagnant sales growth tend to be more vulnerable to financial distress (Leonardo & Noto Soetardjo, 2024).

On the other hand, profitability is a fundamental indicator that reflects the financial health and performance capability of a company. Companies that are able to generate stable

and high profits will have better resilience in facing economic and financial pressureobligations and invest in future business growth. Thus, profitability is expected to moderate the negative influence of financial determinants on the risk of financial distress.
The period 2020-2024 is a relevant time frame for this study as it covers two important phases, namely the COVID-19 pandemic in 2020 to 2021, which had a widespread impact on various sectors, including mining, through supply chain disruptions, declining global demand, and commodity price fluctuations (Kusumastuti, Tiswiyanti, & Marselina, 2023). Furthermore, 2024 is an important year due to the national political transition, namely the change of leadership of the Indonesian president, which historically has caused uncertainty in the direction of strategic industrial policies, including mining commodities (Vivi Yulianingrum, Absori, & Ayu Hasmiati, 2021). Political uncertainty during and after the transition of power can create volatile market sentiment and influence investment decisions in this sector. Investors may become more cautious in investing their capital until there is clarity regarding the direction of mining policy under the new leadership. This condition has the potential to affect the financial performance of mining companies and increase the risk of financial distress, especially for companies with weak financial fundamentals (Kharis & Nugrahanti, 2022).

LITERATURE REVIEW

Theory

The pecking order theory and trade-off theory underlie the relationship between leverage, liquidity, company size, and profitability with financial distress. The pecking order theory (Myers, 1984) states that companies tend to prioritise internal financing (retained earnings) before seeking external financing, so that high profitability can reduce dependence on debt. The pecking order theory states that companies will prioritise financing from internal sources (retained earnings), followed by debt, and finally external equity. When companies do not generate sufficient profits (low profitability), they are more likely to use debt, which increases the risk of distress.Meanwhile, trade-off theory (Kraus & Litzenberger, 1973) emphasises the importance of balancing the risks and benefits of using debt in a company's capital structure. This view is an extension of the theory (Modigliani & Miller, 1963) which states that the use of debt can increase the value of a company because interest on debt is deductible or can reduce the company's tax burden. Thus, a capital structure that contains a certain amount of debt is considered capable of increasing company profitability. This study aims to examine whether profitability. Trade-off theory explains that companies will balance the benefits and costs of using debt. When the debt burden is too high and is not offset by the company's ability to generate profits, the risk of financial distress increases.

Research Gap

Research conducted by Sugiharto, Putri, and Nur'alim (2021) shows that liquidity (current ratio) and sales growth have a significant negative effect on financial distress, while leverage (DAR) has a significant positive effect. However, Profitability, proxied by Return on Assets (ROA), can only moderate the relationship between Liquidity and Financial Distress, but not between Leverage and Sales Growth. These results are in line with the research (Sutra & Mais, 2019) which found that Liquidity, Leverage, Operational Capacity (TATO), and Profitability have a significant effect on Financial Distress in mining companies, while Sales Growth does not have a significant effect. This differs from (Aini & Purwohandoko, 2019), who stated that only Leverage and Profitability have a significant negative effect on Financial Distress, while Liquidity, Operational Capacity, and Sales Growth have no effect. Similar findings were reported by (Umamah & Nurasik, 2023), who found that Leverage has a significant positive effect on Financial Distress, but Liquidity and Profitability do not have a significant effect.

This study is a replication of the study by (Widhiastuti & Pradnyani, 2024) entitled "The role of profitability as a moderator of financial distress determinants in mining companies.

”The results of this study indicate that liquidity, leverage, operating capacity, and size have a significant effect on financial distress, while sales growth has a negative effect. Profitability has been proven to moderate the effect of the relationship between operating capacity, sales growth, and size, but it cannot moderate the effect of liquidity, leverage, and financial distress. These findings are in line with the research conducted by (Rays & Sintia, 2022). Profitability can weaken the influence of liquidity and leverage on financial distress, while profitability cannot moderate (weaken or strengthen) the influence of sales growth on financial distress. Research conducted by (Leonardo & Noto Soetardjo, 2024) shows that the liquidity variable can have a significant negative effect on financial distress, but operating capacity cannot yet have a significant effect on financial distress. This study also states that company size and operational capacity are determining factors in predicting financial distress.

This study aims to examine whether profitability acts as a moderating variable in the relationship between liquidity, leverage, company size, operational capacity, and sales growth on financial distress in mining companies listed on the Indonesia Stock Exchange during 2020–2024. Although previous studies have examined the direct influence of financial ratios on financial distress, few studies have specifically discussed the role of profitability as a moderating variable in this relationship, especially in the context of the mining sector in Indonesia during the period 2020–2024. This indicates the need for further research that not only identifies the determinants of financial distress but also examines how profitability can strengthen or weaken the influence of financial determinants on the potential financial difficulties of companies.

HYPOTHESIS

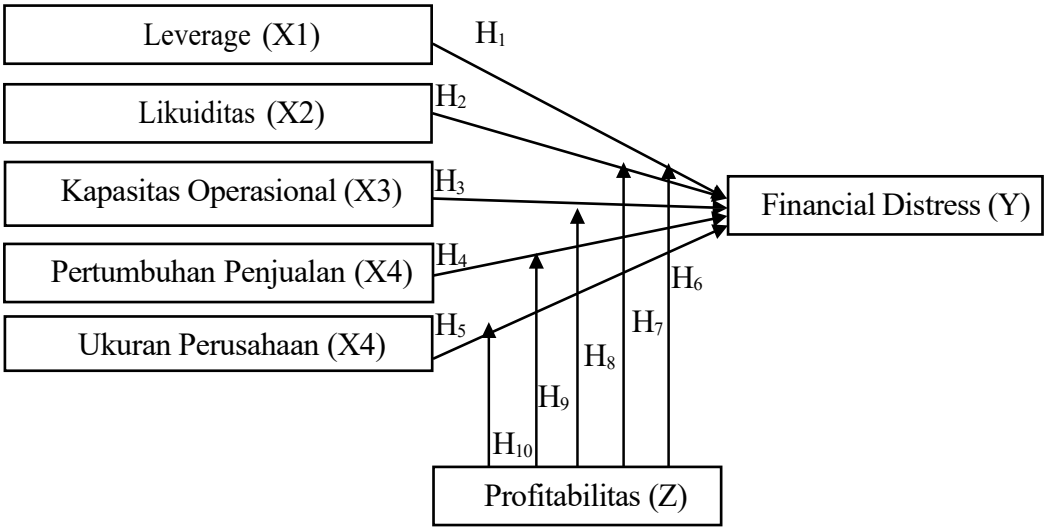

Figure1. Conceptual Framework
Source: Processed Data (2025)

According to signalling theory (Spence, 1973), high liquidity sends a positive signal to investors and creditors that the company has a safe margin in meeting its short-term obligations (Pebriani, Syafitri, & Meiriasari, 2024). According to trade-off theory (Kraus & Litzenberger, 1973), companies are able to maintain a balance between optimal interest rates and bankruptcy risk, with liquidity being one of the main drivers of this balance. (Astuti & Sjarif, 2022) conducted a study on mining sector issuers on the Indonesia Stock Exchange from 2013 to 2020 and found that the current ratio significantly reduced financialdistress.

Previously, (Pebriani et al., 2024) also identified liquidity as a key factor influencing financial distress in mining and metal issuers, reinforcing the argument of a negative relationship between CR and distress risk. Research by (Adityaningrum, Widyaningrum, & Mahirun, 2024) and an international study (Marginingsih, Manurung, Buchdadi, & Yusuf, 2024) showed a significant negative effect of liquidity on financial distress. **H1: Liquidity (Current Ratio) has a significant negative effect on financial distress.**

High leverage indicates a heavy reliance on debt as a source of funding. Although debt can increase returns through the leverage effect, excessively high debt levels without adequate repayment capacity will increase interest expenses and the risk of default (Oktaria, Yanida, Alexandro, Tonich, & Putri, 2021). The trade-off theory (Myers, 1984) states that debt reduces the cost of capital up to a certain threshold, but if excessive, it will increase the risk of bankruptcy. Furthermore, agency theory explains that high leverage can trigger conflicts of interest, with management possibly taking excessive risks due to high interest expenses (Jensen & Meckling, n.d.). The tendency towards high debt increases financial expenses and the risk of default. Research (Pebriani et al., 2024) in a 2018–2022 study found that DER does not directly have a significant impact on distress, but when viewed together with ROA, leverage increases risk when profitability is low, but the effect is different when profitability is high. Although (Astuti & Sjarif, 2022) did not find DER to be influential, this is likely because the effects of debt are more complex and require further moderation or interaction analysis. These findings are in line with (Marginingsih et al., 2024) and global research related to trade-off theory (Kraus & Litzenberger, 1973). H2: Leverage (Debt Asset Ratio) has a significant positive effect on financial distress

High sales growth indicates an increase in demand for a company's products or services, which in turn increases revenue and cash flow. Conversely, stagnant or declining sales can be an early sign of financial difficulties and lead to financial distress. Based on signalling theory (Spence, 1973), sales growth sends a positive signal that the company is growing and has the potential to generate sustainable cash flow. However, in the BEI mining sector, (Astuti & Sjarif, 2022) found that sales growth did not have a significant effect on financial distress. This indicates that although theory supports a negative relationship, the reality of the mining sample during the research period shows that sales growth alone is not sufficient to reduce the risk of distress without the support of other factors. H3: Sales Growth has a significant negative effect on financial distress

Operational capacity is typically measured by operational efficiency (e.g., asset turnover or the ratio of operational costs to revenue). Operationally efficient companies are able to manage costs better and produce higher output with minimal input. Efficient asset utilisation reduces the potential for financial distress. A significant negative effect was found in the energy sector (Adityaningrum et al., 2024).

The asset turnover ratio (TATO) reflects how effectively a company's assets generate revenue. Productively utilised assets will increase cash flow, thereby reducing financial pressure (Sihombing, Siregar, Sinaga, Sinaga, & Siallagan, 2025). Research (Maninggarjati, Wulaningrum, Fitriana, & Putra, 2022) on the coal mining industry shows that TATO has a significant effect on financial distress, and capital structure mediates this relationship. Similarly, a study (Yunika & Rahmizal, 2022) on BEI manufacturing found a significant negative effect of TATO on distress. H4: Operational Capacity (Total Asset Turnover) has a significant negative effect on financial distress

Large companies (usually measured by total assets or sales) demonstrate economies of scale, operational stability, and easier access to funding. Large companies also tend to be better known and have a good reputation in the eyes of creditors. Therefore, they have a lower risk of financial distress than small companies that are vulnerable to market shocks. Based on the theory of economies of scale (Marshall, n.d.), large companies can

reduce unit costs to strengthen their competitiveness. Large-scale companies also have broader access to funding and market segment diversification, which reduces financial risk.

A study (Nailufar, Sufitrayati, & Badaruddin, 2018) covering various company sectors on the IDX shows that company size significantly predicts a decrease in distress risk. Although specific data on the mining sector is still limited, this general trend is consistent across various industries. H5: Company size has a significant negative effect on financial distress.

With high ROA, companies are not only able to meet their short-term obligations (liquidity), but also have strong earning power. This reinforces the negative effect of liquidity on financial distress. This means that companies that are both liquid and profitable have a much lower risk of distress. The trade-off theory (Myers, 1984) states that profitability (ROA) provides internal reserves that strengthen the effect of liquidity in meeting obligations. In addition, the pecking order theory (Myers, 1984) states that companies prefer internal funds, and high ROA strengthens the role of CR as a buffer. An analysis (Astuti & Sjarif, 2022) found a significant interaction between CR and ROA that strengthens liquidity's ability to reduce distress in mining issuers. An additional study (Nailufar et al., 2018) also confirms that profitability increases the protective effect of liquidity against financial risk. H6: ROA moderates the effect of liquidity on financial distress

High leverage typically increases the risk of financial distress. However, if a company has high ROA, then the debt burden can be more easily borne because the income from assets is substantial. Thus, high ROA weakens the negative effect of leverage on financial distress. In trade-off theory (Myers, 1984), debt is worth using to reduce capital costs, but only within the limits of sufficient profitability. A high ROA makes interest expenses easier to manage, which means that leverage is not always dangerous if the company remains profitable. According to (Marginingsih et al., 2024), profitable companies are better able to withstand debt burdens, reducing the relationship between leverage and distress. (Pebriani et al., 2024) found that a high DER accompanied by low ROA increases the risk of distress; however, if ROA is high, the negative effects of leverage are reduced. These research results support the hypothesis that profitability mitigates the negative impact of DER. H7: ROA moderates the effect of leverage on financial distress.

High sales growth does not always mean good financial performance if it is not accompanied by profits. However, if this growth also generates high profits (high ROA), the company's ability to avoid distress increases. ROA reinforces the positive effect of sales growth in reducing the risk of distress. According to the resource-based view (Barney, 1991), sales growth supported by high ROA indicates internal strength and reinvestment capacity, reinforcing the positive effect of sales growth in reducing financial risk. The positive effect of sales growth on reducing distress is stronger in profitable companies. This is supported by global research (Hastianingsih & Mareta, 2024) and research (Nailufar et al., 2018) which states that profitability amplifies the distress-reducing effect of sales growth in financial distress. H8: ROA moderates the effect of sales growth on financial distress.

Operational efficiency will be more effective in preventing distress if the company also has a good profit level. With high ROA, efficient asset management will directly impact profits, thereby strengthening the negative effect of operational capacity on financial distress. Research (Adityaningrum et al., 2024) found that TATO affects distress, but capital structure and ROA strengthen this relationship. This indicates that asset effectiveness is more effective in reducing distress when profitability is high. H9: ROA moderates the effect of TATO on financial distress

Large companies with high ROA are better able to utilise scale and operational efficiency to generate high profits. Thus, the risk of financial distress is reduced. On the other hand, large but unprofitable companies remain at risk of distress. Therefore, ROA strengthens the negative relationship between size and distress (Sari & Isbanah, 2024). Large companies usually have greater internal capabilities, but without high profitability, scale structure does not fully guarantee financial security. A study (Nailufar et al., 2018) noted a significant interaction between size and ROA in reducing the risk of distress. H10: ROA moderates the influence of size on financial distress

METHODS

This study uses a quantitative approach. The population used in this study are mining companies listed on the Indonesia Stock Exchange (IDX) during the period 2020-2024. The data source used is secondary data. Secondary data is data that is obtained in a finished form, has been processed and published (Sugiyono, 2016). The data sources in this study were obtained from the 2020 to 2024 financial reports of mining companies, which are available on the website www.idx.co.id and the websites of each company studied. The sample was determined using purposive sampling, which is the determination of data samples with certain criteria (Sugiyono, 2016). The criteria used are as follows. This study uses Moderate Regression Analysis (MRA) to identify how several independent variables influence the dependent variable and to test whether profitability can influence the relationship between independent variables and financial distress.

Table 1. Research Sample

Sampling Criteria	Number
Mining companies listed on the IDX from 2020 to 2024 that actively publish annual financial reports.	63
Mining companies that do not use the rupiah currency.	(30)
Mining companies that have complete financial data and have not been delisted during the research period.	(9)
Number of mining companies included in the research sample	24
Number of sample observations (5 × number of samples)	120

Source: Processed Data (2025)

RESULTS

Classical assumption test

Normality Test

A normality test needs to be performed using the One-Sample Kolmogorov-Smirnov Test method to determine whether the residual data from the regression model is normally distributed with the decision rule that if the significance is greater than α = 0.05, then the data can be said to be normal (Indartini & Muthmainah, 2024). The test results show an Asymp. Sig. (2-tailed) value of 0.159. This value is the p-value that forms the basis for decision making in normality tests. Therefore, it can be concluded that the Asymp. Sig. Value of 0.159 > 0.05 means that the normality assumption has been met, so the regression model used is suitable for further analysis from a classical statistical perspective.

Multicollinearity Test

The Multicollinearity Test aims to determine whether there is a strong or perfect linear relationship between the independent variables in the regression model. This test is carried out using tolerance and Variance Inflation Factor (VIF) values as indicators (Indartini & Muthmainah, 2024). Based on the analysis results, all independent variables in the model have tolerance values above 0.10 and VIF values below 10. In detail, the

tolerance values range from 0.767 to 0.952, while the VIF values range from 1.051 to 1.304. These values indicate that there is no indication of multicollinearity among the independent variables used. Therefore, it can be concluded that the regression model meets the assumption of multicollinearity freedom.

Autocorrelation

The autocorrelation test is conducted to determine whether there is a correlation between the residuals in a given period and the residuals in the previous period in a regression model (Indartini & Muthmainah, 2024). One of the methods commonly used to detect autocorrelation is the Durbin-Watson (DW) test. The DW statistical value ranges from 0 to 4, with the following interpretation: Durbin upper limit (DU): 1.7896 and Durbin lower limit (DL): 1.6164, with the condition that there is no autocorrelation if DU<DW<4-DU.

The Durbin-Watson value after using Durbin's Two-step method with a Durbin-Watson value of 1.860 concludes that there is no autocorrelation or that the autocorrelation assumption is fulfilled. Since the DW value is between these limits (1.7896 < 1.860 < 2.2159), it can be concluded that there is no autocorrelation in this regression model. Thus, the model meets the assumption of autocorrelation freedom, which means that the residuals between observations are not systematically related.

Heteroscedasticity Test

Based on the results of the heteroscedasticity test using the White Test, the significance values (Sig.) for each independent variable as follows: liquidity of 0.434, leverage of 0.293, operational capacity of 0.312, sales growth of 0.201, size of 0.150, and profitability as a moderating variable of 0.394. Referring to the decision-making criteria, where if the significance value is greater than 0.05, there is no indication of heteroscedasticity, it can be concluded that the variables in this model do not experience heteroscedasticity problems. Then, Table 1 shows the Regression test.

Table 1. Regression Test

Variable	test result		
	Regression coefficient	t-test	Sig.
(Constant)	3.528	2.976	0.004
likuiditas	0.482	19.370	0.000
leverage	-4.363	-28.335	0.000
KO	1.050	19.472	0.000
SG	0.042	0.718	0.474
SIZE	-0.037	-0.892	0.374
ROA	16.670	1.800	0.075
CR X ROA	1.479	2.283	0.025
DAR X ROA	-1.147	-0.775	0.440
TATO X ROA	-0.602	-0.711	0.479
SG X ROA	-0.289	-0.334	0.739
Size X ROA	-0.451	-1.315	0.192
Dependent Variable: ALTMANZS			

Source: Processed Data (2025)

The Effect of Liquidity on Financial Distress

Liquidity in this study was found to have a positive and significant effect on financial distress, with a coefficient value of 0.482 and a significance of 0.000. This indicates that the higher the company's Current Ratio (CR), the higher the likelihood of the company experiencing financial distress. Thus, the first hypothesis, which states that "Liquidity (Current Ratio) has a significant negative effect on financial distress," is rejected. This can be explained by the fact that a high Current Ratio does not always reflect a healthy financial condition, but can be an indicator of an accumulation of unproductive current assets, inefficiency in working capital management, or a company's defensive strategy

that is less aggressive in utilising its assets for growth. Therefore, in certain contexts, high liquidity can actually be an early signal of financial pressure or financial distress. This finding is in line with research conducted by (Wijaya & Suhendah, 2023), as well as (Rochendi & Nuryaman, 2022), which also found that the current ratio has a significant positive effect on financial distress. These results are also in line with the findings of (Islam & Umaimah, 2024) and (Waaliy & Mudjijah, 2024), which state that strong liquidity is a company's main defence against financial pressure. Conversely, if liquidity is low, companies are vulnerable to failure in meeting their short-term obligations, which is the main trigger for financial distress.

The effect of leverage on financial distress

In this study, leverage (debt-to-asset ratio) showed a negative coefficient of –4.363 and a significance value of 0.000, which means that leverage has a significant negative effect on financial distress. Thus, the initial hypothesis stating that "leverage (DAR) has a significant positive effect on financial distress" is rejected. This means that the higher the level of leverage (the proportion of debt to total assets), the greater the risk of a company experiencing financial difficulties. In this context, leverage reflects the extent to which a company relies on debt to finance its assets. High dependence on debt increases interest expenses and principal payment obligations that must be met periodically. A large debt burden also has the potential to violate agreements with creditors, thereby adding to the company's financial pressure. The interpretation of these negative results can be explained through trade-off theory (Kraus & Litzenberger, 1973), which states that companies tend to balance the tax benefits of borrowing with the costs of bankruptcy at a certain point; moderate leverage actually strengthens the capital structure, thereby reducing the risk of distress. In addition, in the context of companies listed on the IDX, the proportional use of debt can assist in restructuring and operational funding without causing excessive burdens, thereby strengthening the company's liquidity stability. These findings are in line with several studies in Indonesia which show that high leverage actually reduces the risk of financial instability. For example, research by (Putri & Andayani, 2024) on various industrial sectors also shows the negative impact of leverage on financial distress. In addition, (Rangga, Hapsari, Santoso, & Santoso, 2025) also noted that leverage has a significant negative impact. However, this differs from (Pratiwi & Sudiyatno, 2022) in the service sector, where leverage is not significant, indicating that the effect of leverage is highly dependent on the characteristics of the industrial sector.

The Effect of Sales Growth on Financial Distress

Sales growth in this model has a positive coefficient of 0.042, but it is not statistically significant with a p-value of 0.474. Thus, the initial hypothesis stating that "sales growth has a significant negative effect on financial distress" is rejected. Although the direction of the coefficient indicates a positive relationship, meaning that numerically an increase in sales growth is in line with an increase in potential financial distress, statistically this relationship cannot be proven. This insignificance may be due to several factors. First, sales fluctuations in the mining sector are highly dependent on unstable global commodity prices, so that an increase in sales volume is not necessarily followed by an increase in real income. Second, sales growth does not always reflect cost efficiency or profitability; sales may increase but be accompanied by high operating costs, so that profit margins remain low. Third, external factors such as government regulations or environmental issues can affect sales results without directly impacting the financial health of the company (Istiani & Amrulloh, 2024). These findings are in line with the results of research (Waaliy & Mudjijah, 2024) which also states that sales growth is not significant for financial distress, but contradicts research by (Sugiharto et al., 2021) and (Rahmawati & Respatiningsih, 2024), which shows that sales growth does not always have a significant effect on financial distress due to other internal factors.

The Effect of Operational Capacity on Financial Distress

The test results for the operational capacity variable (total asset turnover) show a significant positive coefficient of 1.050 with a p-value of 0.0000. This means that

statistically, operational capacity has a significant positive effect on financial distress. Thus, the initial hypothesis stating that “operational capacity has a significant negative effect on financial distress” is rejected. This implies that the higher a company’s operational capacity, the lower its potential for experiencing financial distress. Operational capacity is measured through total asset turnover, reflecting how effectively a company utilises its assets to generate income. If a company is able to optimise all of its assets to support production and sales activities, its ability to generate profits will increase, making the company more resilient in the face of financial pressure (Fitriyani, Rissawati, & Kulsum, 2025).

These results are in line with research conducted by (Santika, 2023), which states that activity levels cannot be used as a reference to predict whether a company will face financial difficulties. These findings support the results of research by (Waaliy & Mudjijah, 2024), which found that operating capacity is significant in reducing the risk of financial distress. Conversely, research (Santika, 2023) in other sectors shows different results, indicating that the influence of operational capacity can vary depending on the industry context. These results are supported by (Tanjaya & Ratmono, 2024), who state that asset efficiency can strengthen a company’s financial performance.

The Effect of Company Size on Financial Distress

The test results for the company size variable show a negative coefficient of -0.037 with a p-value of 0.374, which is statistically insignificant in terms of its effect on financial distress. Thus, the initial hypothesis stating that “company size has a significant negative effect on financial distress” is rejected. Large companies are expected to have better financial capabilities, access to financing, and market power to overcome financial pressures, so they tend to avoid financial distress. Large companies generally have more stable assets, a broader product portfolio, and good relationships with financial institutions, so the risk of bankruptcy is relatively lower than that of small companies. However, in this study, although the coefficient shows a negative direction (as predicted by theory), the effect is not statistically significant. This means that company size is not strong enough to independently explain changes in financial distress in the sample population of mining companies studied. This may be due to the unique characteristics of the mining industry, which is capital intensive and highly dependent on external factors such as global commodity price fluctuations, changes in government policy, and operational uncertainty (Maureen, Camillo, Aulia, & Manurung, 2025).

This is in line with research by (Sari & Isbanah, 2024), which found that the size variable is not always significant in influencing financial distress in the natural resource industry in Indonesia because external factors such as export dependence and world market prices are more dominant than the size of a company’s assets or total sales. These results are consistent with the findings of (Rochendi & Nuryaman, 2022), which show that firm size is not a significant determinant of financial distress. These results contradict the findings of (Oktaria et al., 2021), which state that size can reduce the risk of distress.

The role of profitability in moderating the effect of liquidity on financial distress

The results show that the interaction between the Current Ratio (CR) and ROA has a significant effect on Financial Distress, with an interaction coefficient of 1.479 and a p-value = 0.025 (< 0.05), thus accepting the hypothesis that "ROA moderates the effect of liquidity on financial distress". This means that high profitability strengthens the effect of liquidity in reducing the risk of financial distress. In other words, companies with high CR and good ROA tend to be better able to avoid distress conditions than companies with high CR but low ROA. This is because the profits generated can improve cash flow management, help meet short-term obligations, and fund operational needs; that is, the higher the CR and ROA, the lower the risk of distress. This moderating effect indicates that liquidity alone is not sufficient to guarantee financial health without adequate profitability (Indriani & Mildawati, 2019).

These findings are in line with research (Mahardika & Mulyawan, 2023) which found that

CR has a significant direct effect on financial distress, as well as (Yusbardini & Rashid, 2019) and (Burnika et al., 2024) which concluded that CR and ROA both have an effect on financial distress. However, there are studies that show different results, such as (Pangestu & Hirliana, 2023), which reported that CR and ROA do not have a significant effect on financial distress.

The role of profitability in moderating the effect of leverage on financial distress

The results of this study indicate that the interaction between Debt to Asset Ratio (DAR) and ROA is not significant (p-value = 0.440), thus rejecting the hypothesis that ROA moderates the effect of leverage on financial distress. Thus, even though companies have high leverage (large debt compared to assets), the profitability factor (ROA) is not strong enough to influence the relationship between leverage and financial distress. This indicates that even though companies have high leverage levels, their ability to generate profits is not strong enough to reduce the risk of financial distress caused by debt. In the context of the mining industry, this condition can be understood because the use of debt is a common practice that has been internalised in the financial structure of companies. In fact, high profitability is often used for expansion that further increases leverage, rather than to reduce financial risk. This finding is in line with the research by Khafid et al. (2019), which found that ROA failed to moderate the relationship between leverage and distress in the mining sector, even though ROA was effective as a moderator between liquidity and distress. Additionally, a study by Idawati (2020) also shows that profitability does not moderate leverage on distress. Conversely, Utami (2023) and Wilujeng & Yulianto (2018) found significant moderation of ROA on leverage. These results contradict our findings, possibly due to differences in methodology or research period. Nevertheless, the role of ROA remains important in supporting liquidity in line with Agency Theory (Jensen & Meckling, n.d.) and the findings of (Khotimah & Hakim, 2022) because managers can utilise profits to support cash flow stability. Company size shows a negative coefficient of -0.037, with a t-value of -0.892 and a p-value of 0.374.

The role of profitability moderates the effect of operational capacity on financial distress

The results of this study indicate that the interaction variable between operational capacity (Total Asset Turnover/TATO) and profitability (Return on Assets/ROA) is not significant as a moderating variable for financial distress, with a p-value of 0.479 (>0.05). This finding contradicts the initial hypothesis that "ROA can strengthen the effect of operational capacity on financial distress," so the hypothesis is rejected. This means that the level of efficiency in the use of company assets to generate sales (operational capacity) is not significantly strengthened or weakened by profitability (ROA) in relation to the company's potential financial distress. In the context of the mining industry, this phenomenon can be explained by the characteristics of the sector, which has a low TATO ratio due to large investments in fixed assets such as heavy equipment, mining land, and other supporting infrastructure that rarely turn over in the short term. Thus, asset utilisation efficiency (TATO) does not necessarily result in high net profit (ROA), given that profitability in this sector is more influenced by external factors such as global commodity price fluctuations, government regulations, and high operational costs (Prasetya & Sari, 2022).

This discrepancy is also in line with the study by Ibnusaret et al. (2023) on the maritime and infrastructure sectors, which states that ROA does not successfully moderate the influence of TATO on financial distress. Conversely, the results of this study contradict the study by Putri and Suzan (2021) in the manufacturing sector, which shows that ROA can strengthen the influence of TATO on reducing the risk of financial distress. International research by Nugroho et al. (2022) shows that ROA effectively moderates the relationship between TATO and distress. Analysis in the global manufacturing sector (Kismanah et al., 2021) found that although TATO significantly affects financial distress, profitability through cash holdings is more effective as a moderator than ROA directly.

Profitability in Moderating the Effect of Sales Growth on Financial Distress

The results of this study indicate that the variable of sales growth (SG) interacting with Return on Assets (ROA) does not have a significant effect in moderating the relationship with financial distress, as indicated by a p-value of 0.739, which is greater than the significance level of 0.05. Thus, the hypothesis stating that "ROA is able to moderate the effect of sales growth on financial distress" is rejected. This finding indicates that an increase in sales is not necessarily followed by a sufficient increase in profitability to reduce the potential for financial distress. In the mining industry, sales growth cannot always be converted into adequate profits, because this sector is greatly influenced by high operational costs, heavy equipment investments, and commodity price volatility in the global market (Wibowo & Sari, 2020). This reinforces the understanding that even if a mining company records increased sales, without efficient production cost management, the risk of financial distress remains high (Kismanah et al., 2021).

These findings differ from the research by Hastianingsih and Mareta (2024), who found that the interaction between sales growth and ROA has a significant positive effect on financial distress in mining companies in China. Conversely, the results of this study are consistent with the findings of Ibnusaret et al. (2023), who also found that the interaction between sales growth and ROA is not significant in influencing financial distress in the maritime and infrastructure sectors in Indonesia. In addition, research by Wardhani and Nugroho (2020) on the Indonesian manufacturing sector also shows that sales growth is not always accompanied by increased profitability, so it is not effective in reducing the risk of distress. This indicates that the role of profitability as a moderating variable is contextual and may differ between industries and countries (Supriyono & Endri, 2021).

The results of this study indicate that the company size variable (Firm Size) interacting with Return on Assets (ROA) does not have a significant effect in moderating the relationship with financial distress, as indicated by a p-value of 0.192, which is greater than the significance level of 0.05. Thus, the hypothesis stating that "ROA can moderate the effect of company size on financial distress" is rejected. This finding indicates that the size of a company's assets or resources does not strengthen or weaken its influence on financial distress by the level of profitability. In the context of the mining industry, although high ROA indicates a company's ability to generate profits from its assets, company size is not able to strengthen this relationship significantly (Wibowo & Sari, 2020). One possible cause is the homogeneity of company size in this sector, where the majority of companies operate on a large scale with high-value fixed assets, resulting in relatively little variability in size between companies. This condition renders the moderating role of ROA less relevant in influencing the relationship between firm size and financial distress (Kismanah et al., 2021).

These results contradict signalling theory, which states that a combination of large size and high profitability should be able to reduce the risk of distress because it reflects the stability and financial strength of the company in the eyes of creditors and investors (Salim & Ismudjoko, 2021). Furthermore, Wardhani and Nugroho (2020) in the Indonesian manufacturing sector also show that despite high profitability, company size does not significantly moderate the relationship with distress risk. This reinforces the assumption that external factors such as commodity price volatility, regulatory changes, and global market conditions have a greater influence on distress risk than internal factors such as asset scale or company size in the mining industry (Supriyono & Endri, 2021).

CONCLUSION

Based on the results of this study, it can be concluded that financial factors such as liquidity, leverage, and operational capacity have a significant effect on the financial distress of mining companies listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024. Liquidity and operational capacity show a positive influence, meaning

that the higher a company's ability to meet its short-term obligations and the more efficient its use of operational assets, the less likely the company is to experience financial distress. Conversely, leverage shows a negative effect, meaning that the higher a company's debt-to-asset ratio, the greater the risk of the company experiencing financial difficulties. However, the variables of sales growth and company size do not show a significant effect, indicating that sales growth and business scale do not necessarily have a direct impact on financial distress in the context of the mining sector. In addition, the profitability variable, measured using Return on Assets (ROA), was found to only moderate the relationship between liquidity and financial distress, while in the relationship with leverage, operational capacity, sales growth, and company size, the moderating role of profitability was not found to be significant. These findings indicate that a company's ability to generate profits only strengthens the relationship between liquidity and financial distress, but does not strengthen or weaken the influence of other financial factors. Overall, this study emphasises the importance of optimally managing liquidity and operational capacity, as well as controlling debt structure to maintain the financial stability of mining companies and avoid financial distress, particularly in facing economic and political dynamics during the COVID-19 pandemic and national government transition.

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