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The Effect of Profitability, Liquidity, and Activity Ratios on Financial Distress with Managerial Ownership as a Moderating Variable

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ABSTRACT

This study examines the effect of profitability, liquidity, dan activity on financial distress, dan investigates the moderating role of managerial ownership. The population comprises transportation dan logistics companies listed on the Indonesia Stock Exchange for the 2021–2025 period. Using purposive sampling, 10 companies were selected, yielding 50 firm-year observations. The panel data were analyzed using Moderated Regression Analysis (MRA) with EVIEWS 14 SV. This study provides an empirical contribution by examining the moderating role of managerial ownership on financial distress within capital-intensive transportation and logistics companies. Profitability significantly affects financial distress, whereas liquidity dan activity demonstrates no significant impact. Additionally, managerial ownership fails to moderate the relationship between these financial ratios dan financial distress. These findings emphasize the necessity for companies to evaluate internal cash resilience dan strengthen management oversight to develop robust risk mitigation strategies against cost volatility.

Keywords: Financial Distress, Financial Ratio, Managerial Ownership.

I. Introduction

The financial health of a company depends heavily on how resilient the company is in managing changes in its operating cost structure. The high proportion of fixed costs compared to variable costs limits the company's flexibility in the face of economic pressures, which ultimately erodes profitability (ROA) and activity (TATO). A decrease in profit margins and operating activities will directly deplete cash flow reserves, resulting in a weakening of the company's liquidity level (CR) (Wruck 1990). If the weakening of these fundamental ratios continues until cash flows are no longer sufficient to cover maturing debt obligations, the company will be dragged into the abyss of financial distress (Opler and Titman 1994). The escalation of geopolitical conflicts in the Middle East in early 2026 triggered the closure of the Strait of Hormuz. This phenomenon creates supply chain shocks that trigger a sharp spike in logistics and raw material costs. Based on the Signaling Theory, the company's inability to mitigate external cost shocks will send a negative signal to the market regarding the prospect of future financial ratios (Hamed, 2026) (Connelly *et.al* 2011). To mitigate negative sentiment and prevent financial distress due to external pressures, Agency Theory postulates the importance of alignment of interests between managers and company owners (Jensen & Meckling 1976). This is where managerial ownership comes in as a governance mechanism. Managers who

are also shareholders will tend to act more prudently, efficiently, and cautiously in taking cost structure policies to save the company from the risk of bankruptcy.

A review of the previous literature shows that there is a sharp empirical debate about the effectiveness of financial ratios in predicting financial distress. Regarding profitability and operating activities, a number of studies have consistently confirmed that the ability to generate profits and asset turnover acts as an effective cushion against the risk of bankruptcy (Arini et al., 2021; Prihatna et al., 2025; Sasongko et al., 2021). However, these positive findings are directly refuted by the research of Althaf and Sri (2025) and Ningsi et al. (2024), who found the absence of the influence of these profitability metrics. The same inconsistency also persists in corporate liquidity instruments. While Ningsi et al. (2024) and Prihatna et al. (2025) prove the urgency of current asset availability, the majority of other studies have instead concluded that short-term liquidity fails to function as a predictor of financial safety (Althaf & Sri, 2025; Arini et al., 2021; Sasongko et al., 2021). These contradictory differences in findings critically indicate that fundamental ratios do not operate in a vacuum; their effectiveness is particularly vulnerable to being distorted by differences in the characteristics of industrial asset structures and long-term debt burdens. This confirms that financial ratio figures alone are not enough, but rather require internal governance mechanisms to mitigate such risks. When structural mechanisms such as company size prove to fail to be a buffer (Lawita & Binangkit, 2022), testing of other governance instruments such as managerial ownership becomes essential to fill this literature gap.

The inconsistency of the findings in previous research indicates that the effectiveness of the corporate governance mechanism is highly dependent on the context of the industry in which the mechanism operates. In contrast to the service sector, the transportation and logistics sector is a capital-intensive industry characterized by a very high fixed cost structure and gigantic physical assets. The high capital intensity in this asset structure has been proven to moderate and distort the influence of internal governance mechanisms on the risk of corporate bankruptcy (Siahaan & Susanti, 2026). This structural condition is logically the basis for why managerial ownership in the transportation and logistics sectors is predicted to respond to the threat of financial distress in different ways. Annisa et al. (2026) assert that the direction and power of the influence of ownership structures are highly tied to the asset wealth structure of a company. Although agency theory postulates that shareholding can help align the interests of managers with shareholders, managers' real ability to instantly maneuver cost efficiency is theoretically limited by the capital burden held back on physical assets. When a crisis hits, attachments to fixed costs and a high proportion of assets that are difficult to liquidate have the potential to make managerial ownership instruments more rigid in preventing financial distress, when compared to industries with flexible asset structures. It is this structural limitation that makes the role of managerial ownership in this sector still an empirical debate that requires further testing. Based on the phenomenon of the closure of the Strait of Hormuz, as well as the ongoing empirical debate in previous research, the formulation of the problem in this study is: Does profitability, liquidity, and activity have a partial effect on financial distress, and is managerial ownership able to moderate the influence of the financial ratio on financial distress?

II. Literature Review and Hypothesis Development

Within the framework of evaluating company performance, Agency Theory (Jensen & Meckling, 1976) and Signal Theory (Spence, 1974) provide an integrated fundamental foundation for understanding the mechanisms behind financial distress. In the midst of information asymmetry conditions, managers as agents often have room to engage in opportunistic behavior that has the potential to erode the company's value and push business entities into financial difficulties (Ariesta & Chariri, 2013). To cover up these operational inefficiencies, management often manipulates the level of accounting conservatism, which ultimately sends distorted signals to the market regarding the reality of the company's true financial health (Hendrianto, 2012). Therefore, financial distress, which is fundamentally defined as the inability of a company to meet its financial obligations (Platt & Platt, 2002), is not just an ordinary operational failure, but a real manifestation of severe agency conflicts and malfunctions of market signals. Especially in capital-intensive industries such as the

transportation and logistics sectors, the detection of bankruptcy risk requires more specific measurement instruments. Approaches such as *the Modified Altman Z-Score model* (Altman, 2002) are considered crucial because they are able to eliminate asset turnover bias in order to predict financial failures in this sector to be more objective and accurate.

As an early detection instrument, fundamental ratios do not operate in isolation, but rather act as a vital interconnected signal regarding the company's operational resilience. Profitability, which is proxied through *Return on Assets* (ROA), reflects the entity's real ability to make a profit from total assets under management. A review of the empirical literature suggests that high profitability forms a major line of defense against the risk of default, as it indicates a company's ability to generate resilient internal cash flow to cover maturing obligations (Fahrezi, Dosinta, & Fahmi, 2025; Prihatna et al., 2025). Although a number of follow-up studies such as the research of Ningsi, Akila, and Mursalin (2024) found inconsistencies—where the impact of profitability on bankruptcy risk is highly dependent on the underlying capital structure—its ability to generate profits logically remains a positive signal that reassures creditors and shareholders. Thus, the higher the level of profitability of an entity, the greater its ability to generate protective cash reserves to suppress the probability of bankruptcy. Based on this deductive rationalization, the hypothesis formulation is proposed as follows:

H1: Profitability has a negative effect on financial distress.

In line with profit-making capabilities, liquidity resilience measured through *the Current Ratio* (CR) plays an essential role in maintaining short-term financial stability. Adequate liquidity signals that the company has sufficient current assets to be immediately converted into cash to pay off urgent debts. Prihatna et al. (2025) affirm that solid cash availability is an absolute protector against the threat of an operating deficit. Although the empirical debate put forward by Abdullah and Sari (2024) indicates that liquidity instruments alone may not always be consistent in predicting the safety of entities in the midst of a systemic crisis, the absolute absence of current assets will directly paralyze the company's operational wheels. Therefore, the company's ability to manage and maintain an optimal level of current asset availability is projected to directly reduce the company's vulnerability to the risk of financial difficulties. On the basis of these arguments, the hypothesis is drawn as follows:

H2: Liquidity has a negative effect on financial distress.

In addition to profitability and liquidity resilience, operational management efficiency proxied through *Total Asset Turnover* (TATO) is a crucial element that ensures the sustainability of a company's revenue stream. This activity ratio measures how effectively management utilizes its infrastructure and physical assets to generate sales volume, which ultimately supports the cash inflow cycle. Studies conducted by Putri and Artini (2025) and Widyayanti and Kristianti (2024) prove that optimal asset turnover is able to significantly mitigate the risk of *financial distress* by ensuring the availability of fresh funds from operating activities on an ongoing basis. In the capital-intensive logistics sector, slow asset turnover is often a structural challenge; However, the efficiency of operational activities remains the main driving force that keeps companies away from business stagnation. Consequently, the higher level of asset utilization efficiency is logically predicted to reduce the chances of business entities falling into bankruptcy. Based on this framework, the hypothesis is formulated:

H3: Activities have a negative effect on financial distress.

In the framework of corporate governance, Agency Theory postulates that a convergence of interests occurs when management owns a proportion of shares within the business entities they manage. Managers no longer simply act as executing agents, but also as owners who bear the financial impact of every strategic

operational decision (Jensen & Meckling, 1976). However, the effectiveness of this internal oversight is greatly influenced by the structural conditions of the industries in which the mechanism operates. In capital-intensive sectors with high fixed cost burdens, managers' ability to respond to the threat of bankruptcy is often hampered by asset rigidity. This condition has sparked empirical debate about the extent to which ownership structures are able to intervene in the relationship between the fundamental performance of financial ratios and the stability of corporate entities.

The company's ability to generate profits from the utilization of its assets proxied through Return on Assets is the main line of defense against the cash flow deficit. When profit margins shrink due to the volatility of operating costs inherent in capital-intensive industries, market pressures demand aggressive and measurable operational adjustments. In this crisis situation that threatens survival, managers with shareholding have a much stronger economic incentive to maintain the survival of business entities than to engage in opportunistic actions that damage the company's long-term value (Ariesta & Chariri, 2013). The existence of managers who have the status of owners specifically encourages intervention in the cost structure. In contrast to ordinary agents who tend to maintain discretionary spending for managerial convenience, owner managers will execute very strict operational cost efficiency to contain the rate of decline in net profit. This managerial intervention channel on profitability focuses exclusively on rationalizing operating expenses and securing margins so that losses do not directly erode their personal wealth portfolios. This theoretical argument is in line with the findings of Prayogi, Murdianingsih, and Handayani (2022) and Rahmansyah, Hudzafidah, and Bahri (2024), which prove that the managerial ownership mechanism significantly strengthens management's sensitivity to signals of declining earnings performance. Shareholding provides specific leverage for executives to make potentially unpopular decisions in the form of cutting structural costs in order to maintain internal cash cushions. On the basis of rationalizations that focus on controlling profit margins, the formulation for this test is proposed as follows.

H4: Managerial ownership moderates the influence of profitability on financial distress.

Working capital resilience as measured through the smooth running of assets is a crucial cushion in fulfilling short-term obligations. In the transportation and logistics industry, cash management is often pressured by high commitments to finance long-term physical assets and illiquid infrastructure. Through the perspective of the convergence of interests, managers who concurrently serve as shareholders will feel the consequences of losing wealth directly if the company defaults on current debts that trigger a series of instant bankruptcy (Wruck, 1990). To deepen the theoretical foundation for this hypothesis, it is necessary to understand that the intervention channels of managerial ownership on liquidity operate very differently when compared to profitability. In the liquidity aspect, the intervention operates purely through the implementation of a very conservative cash flow management policy. Internal oversight from the owner manager will force business entities to stop short-term non-essential cash expenditures, limit speculative working capital expansion, and proactively reschedule current liabilities in order to salvage the availability of daily funds. Empirically, Prayogi et al. (2022) confirm that ownership structures effectively intervene in working capital management policies, where management becomes much more cautious and avoids liquidity risks as companies face short-term liability pressures. This internal governance mechanism specific to the safeguarding of emergency cash buffers is ultimately projected to be able to magnify the protective impact of the availability of current assets against the entity's default risk. Therefore, the hypothesis is drawn as follows.

H5: Managerial ownership moderates the influence of liquidity on financial distress.

The optimization of the turnover of all company assets in printing sales revenue is proxied through Total Asset Turnover. The logistics sector naturally has a very slow rate of asset turnover due to its high dependence on heavy infrastructure and massive-scale physical fleets that have a high level of asset

specificity. Although the flexibility of asset turnover is structurally limited by these physical characteristics, strict supervision of shareholder managers will suppress the massive waste of idle operational capacity (Jensen & Meckling, 1976). Answering the theoretical limitations of the previous hypothesis, the managerial ownership moderation channel on activity ratios does not work in the realm of profit margin creation or current cash security, but focuses purely on accelerating the physical rotation of asset utilization. This intervention action manifests itself clearly through optimizing logistics fleet routes to make them more congested, increasing the percentage of return cargo volumes between regions, and strategic decisions to immediately divest or sell fleet units that are no longer productive. Owner managers are morally and rationally motivated to maximize the utilization of existing fixed assets in order to break the stagnant business operating cycle stalemate. The findings from Rahmansyah et al. (2024) reinforce this view by showing that managerial ownership is able to direct management to be more productive in managing rigid physical assets in the midst of a crisis vortex. Consequently, strategic intervention from management acting as the owner is logically predicted to strengthen the mitigation impact of asset turnover efficiency in keeping entities away from financial difficulties. Based on a framework that emphasizes the physical engineering of asset utilization, the hypothesis is formulated as follows.

H6: Managerial ownership moderates the influence of activities on financial distress.

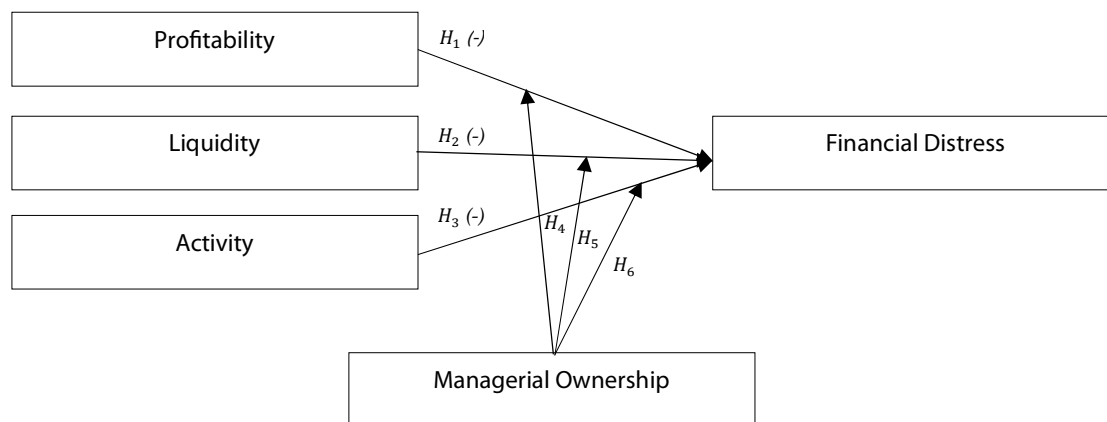


Figure 1. Conceptual Framework

III. Research Method

This study was conducted with an associative quantitative approach to examine the influence of profitability, liquidity, and activity ratios on *financial distress*, and examine the role of managerial ownership as a moderation variable for these relationships. In this study, the researcher utilizes data from the consolidated annual financial statements of companies and annual reports in the transportation and logistics sector that are consistently listed on the Indonesia Stock Exchange in the 2021–2025 period. The quantitative data extraction process was carried out systematically by drawing numbers on the main fundamental items which include net profit, total assets, current assets, current liabilities, operating income, and percentage of managerial share ownership. To ensure the integrity of the data, each extracted metric is cross-validated with the Financial Statement Notes to ensure that no bias arises due to changes in accounting policies or representation. The researcher uses *the purposive sampling* method, which is a sampling technique by setting certain criteria so that the sample obtained is representative and in accordance with the needs of the research. The analysis technique used is *moderation regression analysis* (MRA).

Table 1. Research Sample

No	Criteria	Number of Companies
1.	Transportation and logistics sector companies listed on the Indonesia Stock Exchange	40
2.	Companies that are not registered in the 2021-2025 period.	(12)
3.	Companies that do not publish publicly accessible financial statements.	(3)
4.	Companies that do not declare financial statements in Rupiah.	(4)
5.	Companies that do not report losses on financial statements.	(11)
Number of companies selected as samples in the study		10
Total sample (10 x 5 years)		50

The inclusion criteria require companies to be consistently registered during the observation period and to present the complete audited financial statements in Rupiah to avoid distortion of the exchange rate difference. Furthermore, specific screening is carried out by excluding companies that consistently make a profit, leaving 10 companies as the final sample that results in 50 annual company observations. The selection of this criterion is based on the logical rationalization that financial distress naturally manifests through trends in operating losses. By deliberately limiting the sample to entities that are proven to be facing real financial stress, this test is designed to maximize the sensitivity and accuracy of the Modified Altman Z-Score model in detecting bankruptcy symptoms. This real-condition-based screening process methodologically builds a precise database, so that the results of the empirical testing will later truly measure the extent to which internal governance mechanisms respond to and mitigate crises in problematic entities. Nonetheless, researchers recognize that these restrictions can lead to *sample selection bias*, where research findings may tend to paint the condition of underperforming companies and are limited to generalizing to the overall industry population.

Table 2. Operational Definition of Research Variables

Variabel	Indicator	Scale	Source
Financial Distress (Y)	$Z'' = 6.56 (X1) + 3.26 (X2) + 6.72 (X3) + 1.05 (X4)$ X1 = Net Profit / Total Assets X2 = Total Liabilities / Total Assets X3 = Earnings Before Interest and Taxes / Total Assets X4 = Total Equity / Total Assets	Ratio	(Altman Z-Score, 2002)
Profitability (X1)	LENGTH = Total Net Income / Total Assets	Ratio	(Kasmir, 2019)
Liquidity (X2)	CR = Total Current Assets / Total Current Liabilities	Ratio	(Kasmir, 2019)
Activities (X3)	THIS = Sales / Total Assets	Ratio	(Kasmir, 2019)
Managerial Ownership (M)	KM = Total Shares Owned by Management / Total Outstanding Shares	Ratio	(Rustendi and Jimmi, 2008)

IV. Results and Discussion

4.1. Descriptive Statistics

Descriptive statistics are used to provide an overview of the characteristics of the data used in this study. Table 3 presents the minimum, maximum, mean, and standard deviation values of all research variables including financial distress (Z-Score), profitability (ROA), liquidity (CR), activity (TATO), and managerial ownership (KM) in 10 transportation and logistics sector companies listed on the Indonesia Stock Exchange during the period 2021–2025.

Table 3. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
LENGTH	50	-0,502755	2,071767	-0,013862	0,329135
CR	50	0,025076	60,85811	3,687668	10,44914

THIS	50	0,000516	1,737870	0,601431	0,527190
Financial Distress	50	-92,85584	16,21577	-5,240517	19,95363
Managerial Ownership	50	0,000000	0,502500	0,055468	0,140983

4.2. Chow Test

The Chow test was conducted to choose between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). If the probability value of Cross-section F is less than 0.05, then the Fixed Effect Model is selected, if the Cross-section F is more than 0.05, then the Common Effect Model is selected.

Table 4. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	33,317516	(9,36)	0,0000
Cross-Section Chi-Square	111,658423	9	0,0000

Based on Table 4, the probability value of Cross-section F is 0.0000. The value is less than 0.05. So, the model chosen to proceed to the next stage is the Fixed Effect Model.

4.3. Hausman Test

The Hausman test was performed to choose between the Fixed Effect Model (FEM) and the Random Effect Model (REM). The Fixed Effect Model is more appropriate when the probability value of the cross-section random is less than 0.05. The Random Effect Model is more appropriate to use if the random cross-section is more than 0.05.

Table 5. Hausman Test

Test Summary	Chi-Sq. Statistic	d.f.	Prob.
Cross-section Random	33,317516	4	0,0000

Based on Table 5, the probability value of the Cross-section random is 0.0000. This value is smaller than 0.05, so the most suitable estimation model to be used in this study is the Fixed Effect Model.

4.4. Panel Data Regression Test

The regression analysis of panel data in this study was estimated using the Fixed Effect Model (FEM) approach, in line with the results of the Chow Test and Hausman Test diagnostic tests that had been carried out previously. Hypothesis testing in this study was carried out through two stages of linear regression equations to distinguish direct influence and moderation influence. Model 1 was used to test the direct influence of profitability (X1), liquidity (X2), activity (X3), and managerial ownership (X4) on financial distress (Y). The equation is as follows.

$$Y_{it} = \alpha_i + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \epsilon_{it}$$

Meanwhile, Model 2 uses the *Moderated Regression Analysis* (MRA) method to look at the role of managerial ownership (M) as a moderation variable. This second stage of testing aims to prove whether managerial ownership is able to strengthen or weaken the influence of the three financial ratios on the risk of the company's financial difficulties. The equation is as follows.

$$Y_{it} = \alpha_i + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X1 \times M_{it} + \beta_6 X2 \times M_{it} + \beta_7 X3 \times M_{it} + \epsilon_{it}$$

Table 6. Model 1

Variabel	Coefficient	Std. error	t-Statistic	Prob.
C	-1,661897	2,377094	-0,699130	0,4890
X1 (ROA)	10,42838	2,862456	3,643158	0,0008
X2 (CR)	-0,240183	0,118908	-2,019899	0,0509
X3 (THIS)	-4,565744	3,831392	-1,191667	0,2412
M (KM)	3,563020	12,43211	0,286598	0,7761
R-squared	0,943256		F-statistic	46,03312
Adjusted R-squared	0,922765		Prob(F-statistic)	0,000000

Based on the results above, the regression model equation is as follows.

$$Y_{it} = -1,662_i + 10,428X1_{it} - 0,240X2_{it} - 4,566X3_{it} + 3,563X4_{it} + \epsilon_{it}$$

Based on Table 6, Profitability (ROA) has a coefficient value of 10.42838 with a significance level of 0.0008 (< 0.05). This proves that ROA has a positive and significant effect on the Z"-Score value. A high Z"-Score value means that the company is healthy, so that in substance ROA has a negative effect on the probability of financial distress. Liquidity (CR) has a probability value of 0.0509 (> 0.05). Liquidity has been shown to have no significant influence on financial distress. Activity (TATO) has a probability value of 0.2412 (> 0.05), which indicates that asset turnover does not have a significant influence on financial distress. Managerial Ownership (KM) has a probability value of 0.7761 (> 0.05), which means that the management ownership structure has no partial effect on the risk of financial difficulties. obtained an adjusted determination coefficient (Adjusted R-squared) of 0.9227. This figure indicates that 92.27% of the variation in financial distress can be explained by independent variables in this model, while the remaining 7.73% can be explained by factors outside the model. The model feasibility test (F-test) showed a statistical F-value of 46.03312 with a probability of 0.0000 < 0.05. These results confirm that all independent variables simultaneously have the feasibility of predicting financial distress.

The Adjusted R-squared value that exceeds 90% is classified as very high in the context of social science and accounting research. This high determination value can be explained methodologically by the use of the Fixed Effect Model (FEM) approach in the regression testing of panel data. FEM mathematically estimates different intercepts for each company (individual effect), so that it is able to capture and control the unique characteristics or unobserved heterogeneity of each entity that is constant between time. The specific characteristics of these transportation and logistics sector companies such as the scale of operations, fleet ownership model, and fixed cost structure of the infrastructure have absorbed most of the variation of the value of financial distress. Thus, the model's ability to explain the variation of dependent variables is very high, which confirms that firm-specific effects play a dominant role in determining their financial risk profiles.

Methodologically, econometric literature highlights that panel data specifications incorporating entity-specific dummy variables absorb substantial cross-sectional variation, which naturally elevates the coefficient of determination to exceptional levels (Gujarati & Porter, 2009). As established in foundational econometric studies, controlling for individual heterogeneity through entity-specific intercepts ensures that time-invariant firm attributes are fully accounted for within the regression structure (Baltagi, 2021). In the specific context of capital-intensive industries, corporate risk profiles are heavily dictated by permanent structural attributes such as asset composition, terminal infrastructure ownership, and long-term debt commitments rather than purely short-term operational fluctuations (Wruck, 1990). Consequently, the exceptionally high explanatory power observed in this model does not constitute a statistical artifact or specification flaw, but rather reflects the profound dominance of firm-specific structural traits over general macroeconomic volatility in shaping corporate vulnerability (Wooldridge, 2010).

Table 7. Model 2

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-1,088875	2,672792	-0,407392	0,6864
X1 (ROA)	10,35779	2,994288	3,459183	0,0015
X2 (CR)	-0,242308	0,123375	-1,964000	0,0580
X3 (THIS)	-5,030979	4,050503	-1,239594	0,2239
M (KM)	-31,26184	66,63976	-0,468117	0,6421
X1M (ROA*KM)	-2,772944	63,02662	-0,043996	0,9652
X2M (CR*KM)	9,621779	18,36432	0,523939	0,6038
X3M (DAD*KM)	38,04992	90,03027	0,422635	0,6753
R-squared	0,944218		F-statistic	34,91196
Adjusted R-squared	0,917173		Prob(F-statistic)	0,000000

Based on the results above, the regression equation is as follows.

$$Y_{it} = -1,089_i + 10,358X1_{it} - 0,242X2_{it} - 5,031X3_{it} - 31,262X4_{it} - 2,773X1 \times M_{it} + 9,622X2 \times M_{it} + 38,050X3 \times M_{it} + \epsilon_{it}$$

Based on Table 7, the Interaction of Profitability and managerial ownership (ROA*KM) has a probability of 0.9652 (> 0.05). Managerial ownership does not moderate the effect of profitability on financial distress. The interaction of liquidity and managerial ownership (CR*KM) has a probability of 0.6038 (> 0.05). Managerial ownership does not moderate the influence of liquidity on financial distress. Activity interaction and managerial ownership (TATO*KM) has a probability of 0.6753 (> 0.05). Managerial ownership does not moderate the effect of activity ratios on financial distress. This model has excellent feasibility, as evidenced by a Prob(F-statistic) value of 0.0000 (< 0.05) and an adjusted determination coefficient (Adjusted R-squared) of 0.9171. This means that the independent variables and interaction variables in the model are able to explain 91.71% of the variation in the company's financial distress level.

4.5. Discussion

a. The Effect of Profitability on Financial Distress

The results of empirical testing in this study prove that the profitability ratio has a positive and statistically significant influence on the company's Z-Score. It is important to underline that in the framework of the interpretation of the Modified Altman Z-Score model, a higher score indicates a healthier and more stable financial fundamental condition. Therefore, the direction of the positive coefficient in this regression result provides absolute confirmation that increasing the company's capacity to make a profit will significantly reduce the probability of the entity falling into a state of financial distress. The profitability proxied through the Return on Assets (ROA) ratio basically represents the final manifestation of all operational and strategic efficiencies carried out by the management. When an entity is able to generate a resilient rate of return on assets, it is automatically building a very strong internal cash flow cushion. The availability of these internal funds becomes the most rational first line of defense for companies before they have to seek external funding that often costs much higher capital costs.

Furthermore, the urgency of this profitability becomes very critical when contextualized on the specific characteristics of the transportation and logistics sectors. The industry is inherently characterized by high levels of revenue volatility due to its exposure to fluctuations in global energy prices, supply chain disruptions, and changes in international trade regulations. In the cost structure of the transportation industry, depreciation expenses and fleet maintenance costs consume a massive portion of the operating expenses. This condition creates a very high level of operating leverage. As a result, any decrease in revenue will suppress net profit exponentially. Therefore, the ability of a business entity to print and maintain profit margins is not just a metric of historical performance, but a fundamental cushion that determines how long a company is able to survive burning its cash reserves before being forced to apply for debt restructuring. Companies that

are able to maintain a positive ROA level are proven to have much more resilient structural resilience in withstanding sudden operational cost shocks.

These empirical findings solidly confirm and expand on the consensus of the previous literature. Research conducted by Amin, Santoso, and Estrini (2022) and Hidayat et al. (2024) has consistently also found that profitability acts as the main antidote to the risk of corporate bankruptcy. Likewise, a study from Prihatna, Nidar, and Damayanti (2025) examined the logistics sector specifically, where they asserted that the strength of retained earnings derived from past profitability is the most weighty component of the Z-Score. This alignment of results provides theoretical validation that regardless of the prevailing macroeconomic conditions, markets and creditors will always see the ability to make a net profit from asset utilization as the main fundamental signal for a company's survival. Thus, it can be logically concluded that profitability is the most reliable predictive determinant in keeping companies away from the abyss of financial difficulties.

b. The Effect of Liquidity on Financial Distress

Inversely proportional to the results on the profitability ratio, the statistical analysis in this study reveals that the liquidity ratio does not have a significant influence on the fluctuations of the company's Z-Score. The absence of this influence implies that the entity's ability to pay off its short-term liabilities as measured through the Current Ratio (CR) does not act as a major determinant in predicting bankruptcy risk in this observational sample. Although in the textual literature liquidity is often considered to be the breath of the company's day-to-day operations, this insignificant result makes a lot of sense methodologically and theoretically when viewed from the unique characteristics of the logistics industry and the sample profile used. In highly capital-intensive sectors such as transportation infrastructure, the survival of companies is dictated more by management's success in restructuring long-term debt and securing long-term operational contracts. Current liabilities, although important for daily operations, are relatively intangible when compared to the amount of long-term lease liabilities for a fleet of ships or aircraft.

In addition to being influenced by industry characteristic factors, the absence of significance in this liquidity ratio is strongly driven by the sample selection bias deliberately applied in the design of this study. As described in the methodology section, this study specifically only observes companies that are experiencing losses in a row. Naturally, companies that have been in a prolonged phase of performance decline are likely to have exhausted all of their current asset reserves. Since all the samples in this observation are in almost uniform liquidity crisis conditions and have been depleted, the data variance in the Current Ratio ratio becomes very narrow. This condition statistically makes the liquidity ratio lose its sensitivity to detect or predict further financial deterioration. When all the observed entities are equally struggling to pay their short-term debts, statistical measuring tools require other variables that have a wider range of variance to be able to distinguish which companies will survive and which will actually go bankrupt.

The interpretive explanation of the loss of liquidity predictability in this capital-intensive sector is very much in line with a number of previous empirical findings. Studies conducted by Lawita and Binangkit (2022) and Putri and Artini (2025) also documented a similar phenomenon, where the availability of short-term cash has not been proven to be able to save companies from bankruptcy if their long-term debt structure is already too burdensome on equity. Similarly, research from Arini et al. (2021) highlights that liquidity management is only relevant as a predictor of safety in the light manufacturing industry or the retail trade sector, where the turnover of merchandise inventories occurs in a matter of days. Therefore, the absence of liquidity influence in this study is not a theoretical anomaly, but rather a logical affirmation that short-term financial metrics have very limited analytical capacity when applied to industries whose operational foundations are driven by long-term structural cost commitments.

c. The Effect of Activity on Financial Distress

In line with the dynamics of liquidity testing, the ratio of activities proxied through Total Asset Turnover (TATO) also showed insignificant results on the company's Z-Score. The absence of this predictive impact indicates that the speed or slowness of management in rotating assets to generate sales does not directly affect the level of vulnerability of the company to financial distress. Theoretically, this phenomenon cannot be separated from the structural rigidity inherent in assets in the logistics and transportation sectors. In contrast to retail companies that can liquidate or rotate their inventories in a matter of weeks to print revenue, logistics companies rely heavily on giant-scale fixed assets such as port infrastructure, cargo ship

fleets, transport aircraft, and warehousing complexes. This type of physical asset naturally takes years to be able to return the value of its investment through the accumulation of operating income.

The consequence of this large proportion of fixed assets is that the cycle of total asset turnover is always at a low rate in the industry. Therefore, when logistics companies record slow TATO figures, it does not necessarily represent an acute managerial inefficiency or failure. The low activity ratio in this sample is more accurately interpreted as a reflection of the rigid operational nature of the industry. The market and creditors have generally understood this pattern of slow return on investment, so minor fluctuations in the asset turnover ratio are not immediately responded to as a signal of the danger of bankruptcy. As long as the company is still able to cover its interest expense and depreciation, the slow asset turnover is seen as a reasonable business risk and has been taken into account in the initial financing scheme.

The rational interpretation of these findings has received strong empirical support from previous academics. Altman (2002) in his revision of his bankruptcy prediction model explicitly acknowledged that the variable of asset turnover is susceptible to triggering bias in certain industries, so he removed the variable for non-manufacturing companies to make the bankruptcy assessment more objective. The findings in this study empirically support the foundation of Altman's thought. Amplifying evidence is also presented by Amin et al. (2022) and Susanti and Takarini (2022) who prove that the activity ratio is not relevant to be used as the main indicator of financial safety in sectors with very dense physical infrastructure. Through this logical bridge, it can be concluded that the activity ratio should be interpreted very carefully and cannot be relied on singularly as an independent predictor without considering the specific asset structure of the industry being evaluated.

d. The Role of Managerial Ownership Moderation on Profitability

Interaction testing in this moderated regression analysis shows the result that managerial ownership is proven to fail to moderate the influence between profitability and *financial distress*. At first glance, the insignificance of this variable seems to refute the convergence of interests postulate proposed by Agency Theory (Jensen & Meckling, 1976). However, an in-depth analysis of the data structure reveals a very crucial boundary condition. The key to this moderation failure lies in the descriptive statistics of the proportion of share ownership itself. Based on the observed sample data, the range of managerial ownership does indeed move from the lowest point of 0 percent to the maximum of 50.25 percent. However, the average value of overall shareholding by management in the transportation industry is very small, which is only at the level of 5.54 percent.

This very marginal average figure provides a very strong logical explanation for why Agency Theory fails to work on this sample. At an aggregate level of ownership that is only in the range of five percent, management is still essentially acting purely as agents, not as principals (majority owners). The economic incentives they receive from those percentages of shares are theoretically not proportional to the risk of bankruptcy incurred by the company. Because executives hold a completely intangible fraction of shares, they have no absolute strategic incentive and no substantial voting power in the General Meeting of Shareholders (GMS). When profitability shocks occur, managers with small shareholdings do not have enough authoritative power to intervene or radically change the company's strategic policies. This empirical fact convincingly confirms the premise that internal governance mechanisms cannot work simply by giving shares to managers. In order for the alignment of interests to really occur and be able to affect financial stability, an adequate shareholding threshold is needed so that managers actually feel significant financial losses if the company goes bankrupt. This logical explanation is in line with the findings of Prayogi, Murdianingsih, and Handayani (2022) and Rahmansyah et al. (2024), who assert that managerial ownership that is too small will lose its functional power as a tool of internal supervision, and has the potential to make management apathetic to declining profitability amid the threat of a financial crisis.

e. The Role of Managerial Ownership Moderation on Liquidity

Consistent with the failure of interaction in the previous variable, managerial ownership also proved to be unable to moderate the influence of liquidity on the probability of financial distress. This failure once again boiled down to the low economic incentives owned by managers due to average share ownership which only touched 5.54 percent. In the face of crisis pressure in a company full of large capital investments, management was faced with various options for policy rationalization. With a very minimal portion of ownership, managers did not have adequate psychological or financial motivation to prioritize short-term

liquidity maintenance over the urgency of macro-scale operational rescues. They realized that tidying up the current asset balance sheet would not necessarily save logistics companies from the threat of fleet withdrawal by long-term creditors.

As an implication of these conditions, the management of loss-making companies will tend to concentrate all of their remaining resources and time on negotiating with banks regarding long-term debt restructuring or seeking new capital injections from strategic investors. They will no longer focus their energy on optimizing cash ratios or accounts receivable management, which is a key component of the liquidity ratio. Because current asset depreciation is not the main trigger for bankruptcy in this capital-intensive sector, managerial ownership mechanisms ultimately lack the relevant leverage to interact significantly with the company's liquidity policy. These findings conceptually reinforce previous empirical studies conducted by Prayogi et al. (2022) and Rahmansyah et al. (2024), which indicate that management interventions with minority owner status will not change the direction of company policies related to working capital management in the midst of systemic crises.

f. The Role of Managerial Ownership Moderation on Activities

In the latter interaction test, managerial ownership was also found to have no statistically significant moderation impact on the relationship between activity ratios and *financial distress*. These results provide a comprehensive understanding of the limitations of management's wiggle room in the transportation and logistics industry. Even if a manager has a strong intention to accelerate asset turnover in order to generate additional cash inflows to mitigate financial difficulties, their strategic flexibility is absolutely limited by the physical reality of the assets they manage. Logistics assets such as cargo ships, container depots, or heavy equipment have very low secondary market liquidity levels. Managers cannot immediately sell or rotate these giant assets in a short period of time like they would sell an inventory of electronic goods.

These industry-specific operational and structural barriers become increasingly impenetrable when faced with the neglectful portion of managerial shareholding. Without a position as majority shareholders, the board of directors does not have absolute strategic control to execute extreme decisions, such as liquidating a portion of a business unit or making an instant shift in the operating model to accelerate asset turnover. Any strategic decision related to fixed assets must go through a lengthy approval process from the controlling shareholders. Thus, the interaction between managerial ownership and the level of asset activity is mathematically and conceptually rendered silent or insignificant in changing the company's bankruptcy risk map.

Evaluating the overall results of the above interaction test, the fact that managerial ownership is not proven to be significant either when tested as an independent predictor or when it is functioned as an interaction variable puts this variable in a unique classification. Based on the typological framework of testing the moderating variable comprehensively put forward by Sharma, Durand, and Gur-Arie (1981), the status of managerial ownership in this research design is purely classified as a homologator variable. The homologator variable is a variable that has the potential to influence the strength of the relationship conceptually, but fails to interact statistically with the predictor variable in the model, thus not meeting the stringent qualification requirements to be recognized as a pure moderation variable in detecting financial difficulties in the sample studied.

V. Conclusion

As obtained from the data analysis in this study, it can be concluded that from all the variables tested, profitability has a positive impact on financial distress. This aspect means that companies with greater levels of profitability tend to have a lower chance of experiencing financial distress. On the other hand, the variables of liquidity, activity ratio, and managerial ownership did not have an impact on financial distress. In addition, the results of the interaction effect test also stated that managerial ownership was unable to moderate the impact of profitability, liquidity, and activity ratio on financial distress, functioning purely as a homologator variable due to its exceptionally marginal proportion within the observed firms. The primary limitation in this study lies in the specific sample selection, where the researcher intentionally restricted the observation to transportation and logistics firms experiencing financial pressure or losses, alongside a relatively short five-

year observation period from 2021 to 2025. This deliberate sample boundary, combined with the exclusive use of profitability, liquidity, and activity as independent variables, restricts the broader generalizability of the findings across healthier or cross-sector industrial populations. Despite these structural constraints, this empirical finding confirms that profitability remains the most dominant determining factor for corporate going-concern capability in infrastructure-heavy sectors. To advance the literature on corporate bankruptcy, future research should implement specific methodological and conceptual refinements. First, researchers are encouraged to test alternative governance moderators that possess stronger strategic voting power in capital-intensive firms, such as Institutional Ownership or the proportion of Independent Commissioners. Second, future studies should employ alternative distress prediction models—such as the Springate, Grover, or Zmijewski models—to comparatively assess their sensitivity against the Modified Altman Z-Score in predicting distress within infrastructure-heavy sectors. Finally, from a methodological standpoint, employing Dynamic Panel Data estimators, such as the Generalized Method of Moments (GMM), is highly recommended to robustly address potential endogeneity issues between internal governance structures and financial performance metrics.

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