

The Effect of Profitability, Liquidity, and Leverage on Financial Distress in Manufacturing Companies Listed on the Indonesia Stock Exchange (IDX)

Muhammad Shulhan Ma'arif ¹

¹ Department of Accounting, Faculty of Economics and Business, Universitas Tarumanagara, Jakarta, Indonesia.
Email: muhammadshulhan.m@gmail.com

ARTICLE HISTORY

Received: May 14, 2026
Revised: June 28, 2026
Accepted: July 30, 2026

DOI

<https://doi.org/10.52970/grdis.v6i3.2282>

ABSTRACT

This study aims to examine the effects of profitability, liquidity, and leverage on financial distress in manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Using a quantitative research approach, a total of 49 manufacturing companies were selected as the research sample through purposive sampling. Financial distress was measured using the Altman Z-Score model, while profitability was proxied by Return on Assets (ROA), liquidity by the Current Ratio (CR), and leverage by the Debt-to-Equity Ratio (DER). The research hypotheses were tested using multiple linear regression analysis with SPSS software. The empirical findings indicate that profitability and liquidity have significant negative effects on financial distress, whereas leverage has a significant positive effect on financial distress. Furthermore, the results of the simultaneous test demonstrate that profitability, liquidity, and leverage collectively have a significant effect on financial distress. These findings highlight the critical role of financial performance in predicting financial stability and financial distress risk among manufacturing companies.

Keywords: Altman Z-Score, Financial Distress, Profitability, Liquidity, Leverage.

I. Introduction

The manufacturing sector plays a crucial role in supporting Indonesia's domestic economy through its significant contribution to Gross Domestic Product (GDP), employment generation, and foreign exchange earnings from non-oil and gas exports. For manufacturing companies listed on the Indonesia Stock Exchange (IDX), financial statements are generally prepared in Indonesian Rupiah. Consequently, the financial performance of firms in this sector is highly sensitive to exchange rate fluctuations and changes in the domestic macroeconomic environment. At the same time, the capital market, represented by the IDX, serves as a financial intermediary by providing companies with alternative sources of financing while enabling investors to allocate capital according to their risk preferences and expected returns (Adi et al., 2020).

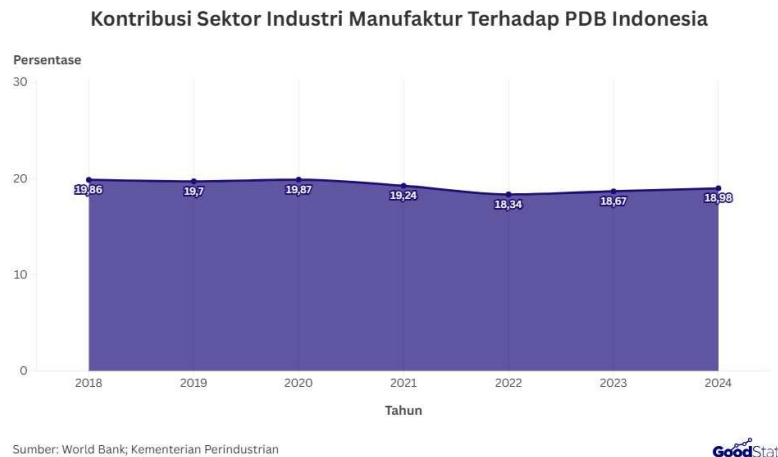


Figure 1. Contribution of the Manufacturing Sector to Gross Domestic Product (GDP)

Despite widespread reports of factory closures in recent years, the manufacturing industry remains one of the primary drivers of Indonesia's economy. In 2024, the sector contributed 18.98% to the country's Gross Domestic Product (GDP), making it one of the largest contributors to national economic growth. The strength of this sector is reflected in the continuous increase in manufacturing output and export volumes. Although the manufacturing sector experienced negative GDP growth during the COVID-19 pandemic, contracting by 2.93%, its performance recovered in 2021 with a growth rate of 3.39%, approaching the pre-pandemic level. In 2023, manufacturing GDP grew by 4.63%. Although this growth was relatively stable, it continued to demonstrate the sector's vital role in Indonesia's economy. However, manufacturing companies have faced substantial financial challenges in recent years. The depreciation of the Indonesian Rupiah has increased the cost of importing raw materials, while high debt levels have placed additional pressure on corporate financial structures. Furthermore, declining consumer purchasing power and weakening market demand have resulted in lower sales performance. This condition is reflected in Indonesia's Manufacturing Purchasing Managers' Index (PMI), which declined to 46.7 in April 2025, indicating a contraction in the manufacturing sector (Bisnis.com, May 12, 2025). Such unfavorable macroeconomic conditions may reduce corporate profitability and increase the likelihood of financial distress, a condition in which a company experiences financial deterioration and encounters difficulties in meeting both its short-term and long-term obligations. If left unresolved, financial distress may ultimately lead to insolvency or bankruptcy. In the financial literature, profitability, liquidity, and leverage are widely recognized as important determinants of financial distress. Baghaskara and Retnani (2023) found that higher profitability reduces the risk of financial distress, whereas greater leverage increases it. Similarly, Ratuela et al. (2022) reported that profitability and liquidity are negatively associated with the likelihood of financial distress, while leverage exhibits a positive relationship. The importance of leverage as a significant determinant of corporate financial vulnerability was further confirmed by Kuntari and Machmuddah (2022).

From a sectoral perspective, previous empirical findings remain inconsistent. Sihombing and Angela (2024) demonstrated that, in the food and beverage subsector, profitability and leverage significantly influence financial distress, whereas liquidity does not have a significant effect. In contrast, Jannah et al. (2021) emphasized that a capital structure dominated by debt (high leverage) substantially increases the probability of financial failure in manufacturing companies. However, Oktavian and Handoyo (2023) reported contrasting evidence, finding that profitability and liquidity positively affect financial distress, while leverage has a negative effect. Other studies have also produced mixed results. Ardi et al. (2020) and Rachmawati and Suprihhadi (2021) argued that liquidity effectively reduces the risk of financial distress, whereas leverage and profitability do not significantly affect financial distress. Conversely, Bukhori et al. (2022) concluded that liquidity, asset activity, and sales growth reduce financial distress, while leverage increases it. These findings

are consistent with those of Octavia et al. (2021), who reported that liquidity and leverage have significant effects on corporate financial stability. The inconsistencies among previous empirical findings reveal a research gap that warrants further investigation. Therefore, additional research is necessary, particularly during the 2022–2024 period, when manufacturing companies have been confronted with post-pandemic recovery challenges, fluctuations in the Indonesian Rupiah exchange rate, and increasing global economic uncertainty. Based on these theoretical and empirical considerations, this study aims to re-examine the effects of profitability, liquidity, and leverage on financial distress among manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. The findings of this study are expected to provide updated empirical evidence and offer practical insights for corporate management, investors, and creditors in mitigating bankruptcy risk within an increasingly dynamic economic environment.

II. Literature Review and Hypothesis Development

2.1. Signaling Theory

Signaling theory, originally introduced by Spence (1973), explains that companies can convey credible information, or signals, to reduce information asymmetry between management and stakeholders during the decision-making process. To be effective, these signals must be clear, relevant, and reliable so that they can enhance external stakeholders' confidence in the company's actual condition (Hahn & Reimsbach, 2020). The information disclosed by companies is commonly utilized by investors, financial analysts, and creditors to assess the firm's future prospects and long-term sustainability. The effectiveness of such signals depends largely on the company's reputation, communication strategy, and consistency in achieving its performance targets. Therefore, companies are expected to provide transparent, concise, and easily understandable disclosures that accurately reflect their current condition and strategic direction.

2.2. Financial Distress

Financial distress refers to a stage of financial deterioration characterized by a company's inability to utilize its assets to meet both short-term and long-term financial obligations when they become due. This condition reflects disruptions in liquidity and solvency, representing an internal financial crisis that precedes insolvency, bankruptcy, or corporate liquidation (Irawan, 2023). Companies experiencing financial distress generally exhibit several warning signs, including a substantial decline in profitability, increasing debt burdens, and disruptions in operating cash flows. According to Kason et al. (2020), a company's inability to fulfill its debt obligations on time accelerates the onset of financial distress, thereby reducing its capacity to conduct normal business operations. Common indicators of financial distress include persistent operating losses, a low interest coverage ratio, insufficient operating cash flow to cover long-term debt obligations, as well as dividend suspension or workforce reductions (Salim & Ismudjoko, 2021). Irawan (2023) identified several major financial factors contributing to financial distress, including:

- a. Capital inadequacy, in which operating cash inflows are insufficient to cover operational expenditures, resulting in a shortage of funds to sustain business activities.
- b. Excessive debt and interest burdens, arising from heavy reliance on external financing without adequate risk management.
- c. Operating losses, reflecting the company's inability to manage revenues and operating expenses efficiently.

If these unfavorable conditions are not addressed through appropriate corrective actions, the likelihood of bankruptcy increases substantially. Therefore, predictive methods that provide early warning signals of financial distress are essential for preventing further financial deterioration. In the accounting

literature, several models have been developed to predict financial distress. Among these, the Altman Z-Score Model is one of the most established and widely adopted approaches. Developed by Edward Altman using the Multiple Discriminant Analysis (MDA) technique, the model combines five financial ratios to assess a company's financial health:

- a. Working Capital / Total Assets
- b. Retained Earnings / Total Assets
- c. Earnings Before Interest and Taxes (EBIT) / Total Assets
- d. Market Value of Equity / Book Value of Total Debt
- e. Sales / Total Assets

By integrating these financial ratios, Altman (as cited in Masdiantini & Warasnasih, 2020) demonstrated that the model can predict corporate bankruptcy with an accuracy of approximately 95% up to two years before bankruptcy occurs. Consequently, financial distress prediction plays a crucial role in providing early warning signals to corporate management, creditors, and investors. Early detection enables companies to implement corrective measures before financial conditions deteriorate further, while also assisting external stakeholders in developing appropriate risk mitigation strategies (Masdiantini & Warasnasih, 2020).

2.3. Profitability

According to Ogachi and Zoltan (2020), profitability reflects management's capability and effectiveness in utilizing the company's assets, capital, and other economic resources to maximize net profit. A high level of profitability indicates operational efficiency and the company's ability to capitalize on market opportunities. Profitability is considered a key indicator for investors in evaluating corporate performance, as sustainable profit growth signals the potential for stable future investment returns. Similarly, Kasmir (2019) defines profitability as a financial measure used to evaluate a company's ability to generate profits during a specific accounting period while assessing management's effectiveness in managing sales, utilizing assets, and optimizing shareholders' equity. A comprehensive analysis of profitability aims to evaluate a company's earnings-generating capacity, compare financial performance across different periods through trend analysis, and assess the efficiency of working capital utilization. One of the most widely used measures of profitability in empirical research is Return on Assets (ROA). This ratio measures the proportion of net income generated from each unit of total assets owned by the company. ROA is regarded as an important indicator because it reflects management's efficiency in converting assets into net profit, which is generally interpreted by investors as a positive signal regarding the company's financial performance. The use of ROA in this study is based on its ability to provide a comprehensive assessment of financial efficiency and its suitability for comparative analyses among manufacturing companies (Putra & Sunarto, 2021). In addition to ROA, Subramanyam (2017) identifies several other profitability indicators, including Return on Equity (ROE), which measures the profitability generated from shareholders' equity; Net Profit Margin (NPM), which indicates the percentage of net income generated from sales revenue; and Operating Profit Margin (OPM), which evaluates the efficiency of the company's core operating activities before non-operating items are considered.

2.4. Liquidity

Liquidity reflects a company's financial capacity to meet its short-term obligations promptly by utilizing its current assets. Conventionally, liquidity is measured using the Current Ratio (CR), which compares total current assets with total current liabilities. According to Thottoli (2021), liquidity is one of the primary indicators used to assess a company's short-term financial resilience. A higher current ratio generally indicates a stronger financial position because current assets are considered sufficient to support business operations

and settle short-term liabilities (Nurunnabi, 2021). However, a high level of liquidity does not always indicate favorable financial performance. Excessive liquidity may result in idle assets, reflecting inefficient utilization of current assets and working capital, which may ultimately reduce profitability and increase the risk of financial distress (Kisman & Krisandi, 2019). Conversely, Oktaviani and Lisiantara (2022) argue that companies with adequate liquidity are better able to meet their short-term obligations, thereby maintaining healthier financial conditions and reducing the likelihood of financial distress. A decline in liquidity often serves as an early warning indicator of financial distress. Brigham and Houston (2021) explain that liquidity represents a company's ability to fulfill its short-term financial obligations. When the growth of current liabilities exceeds the growth of current assets, the company's ability to meet maturing obligations declines, thereby increasing the likelihood of financial difficulties. Subramanyam (2017) identifies three principal indicators commonly used to evaluate liquidity:

- a. Current Ratio (CR): Measures the company's ability to cover all short-term liabilities using total current assets.
- b. Quick Ratio (Acid-Test Ratio): Measures the company's ability to settle current liabilities using its most liquid current assets while excluding inventories, which generally require more time to be converted into cash.
- c. Cash Ratio: Evaluates the company's ability to repay short-term liabilities using only cash and cash equivalents.

Together, these liquidity measures provide a comprehensive assessment of a company's short-term financial strength and enable management to anticipate potential financial distress arising from an imbalance between current assets and current liabilities.

2.5. Leverage

Leverage, also referred to as solvency, is a critical aspect of financial statement analysis that reflects the extent to which a company's capital structure is financed through debt relative to shareholders' equity. According to Kasmir (2019), leverage ratios measure the proportion of total liabilities to total equity, thereby providing a comprehensive assessment of a company's long-term financial stability and its ability to meet all financial obligations. Hery (2018) argues that higher leverage may enhance shareholders' returns through the financial leverage effect. Nevertheless, this financing strategy simultaneously increases the company's exposure to financial risk, particularly under conditions of macroeconomic uncertainty and economic volatility. To evaluate leverage comprehensively, Subramanyam (2017) proposes several key financial ratios, including the Debt-to-Equity Ratio (DER), which measures the proportion of debt relative to shareholders' equity; the Debt-to-Assets Ratio (DAR), which indicates the percentage of total assets financed through debt; and the Times Interest Earned (TIE) Ratio, which evaluates the company's ability to cover interest expenses using earnings before interest and taxes (EBIT). Collectively, these ratios provide a comprehensive overview of a company's financing structure and the level of insolvency risk it faces.

2.6. Hypothesis Development

a. The Effect of Profitability on Financial Distress

Profitability reflects a company's ability to generate profits through the efficient utilization of its assets and resources (Ogachi & Zoltan, 2020). According to Kasmir (2019), high profitability indicates strong financial performance and enhances a company's capacity to finance its operations and meet financial obligations. From the perspective of Signaling Theory (Spence, 1973), high profitability serves as a positive signal of sound financial performance, thereby reducing information asymmetry and increasing stakeholders' confidence. Conversely, declining profitability signals weaker financial conditions and a higher likelihood of

financial distress. Previous studies consistently report a negative relationship between profitability and financial distress. Baghaskara and Retnani (2023), Ratuela et al. (2022), and Sihombing and Angela (2024) found that higher profitability significantly reduces the probability of financial distress. Therefore, the following hypothesis is proposed:

H1: Profitability has a negative effect on financial distress in manufacturing companies listed on the Indonesia Stock Exchange (IDX).

b. The Effect of Liquidity on Financial Distress

Liquidity represents a company's ability to meet its short-term financial obligations using its current assets. The Current Ratio is commonly used to measure liquidity (Thottoli, 2021). A higher liquidity level indicates stronger short-term financial stability and a lower likelihood of financial distress, although excessively high liquidity may reflect inefficient asset utilization (Kisman & Krisandi, 2019). According to Signaling Theory (Spence, 1973), adequate liquidity sends a positive signal regarding a company's financial strength, while declining liquidity may indicate increasing financial risk. Empirical evidence supports a negative relationship between liquidity and financial distress. Studies by Ratuela et al. (2022), Ardi et al. (2020), Rachmawati and Suprihhadi (2021), and Bukhori et al. (2022) concluded that companies with stronger liquidity are less likely to experience financial distress. Accordingly, the following hypothesis is proposed:

H2: Liquidity has a negative effect on financial distress in manufacturing companies listed on the Indonesia Stock Exchange (IDX).

c. The Effect of Leverage on Financial Distress

Leverage reflects the extent to which a company's assets are financed through debt. According to Kasmir (2019), leverage measures the proportion of liabilities relative to shareholders' equity, while Hery (2018) argues that although debt financing may increase returns, it also exposes companies to greater financial risk. Common leverage measures include the Debt-to-Equity Ratio (DER), Debt-to-Assets Ratio (DAR), and Times Interest Earned (TIE) Ratio (Subramanyam, 2017). Based on Signaling Theory (Spence, 1973), a high leverage ratio is generally interpreted as a negative signal because it indicates greater dependence on debt financing and higher fixed financial obligations, thereby increasing the risk of financial distress. Conversely, lower leverage reflects a healthier capital structure and stronger financial stability. Previous empirical studies consistently support this positive relationship. Baghaskara and Retnani (2023), Octavia et al. (2021), Ratuela et al. (2022), Bukhori et al. (2022), Kuntari and Machmuddah (2022), Sihombing and Angela (2024), and Jannah et al. (2021) found that higher leverage significantly increases the likelihood of financial distress. Therefore, the following hypothesis is proposed:

H3: Leverage has a positive effect on financial distress in manufacturing companies listed on the Indonesia Stock Exchange (IDX).

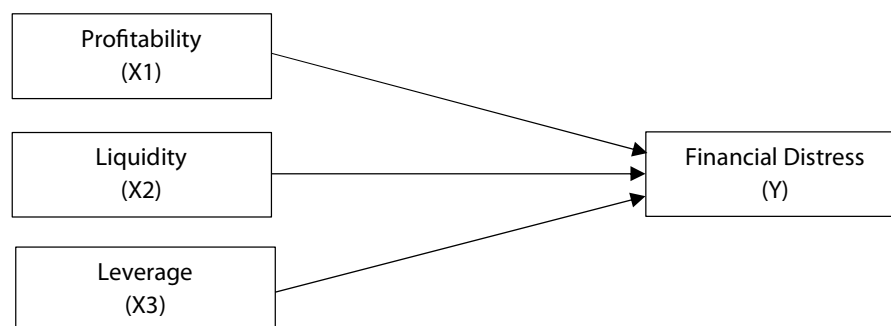


Figure 2. Conceptual Framework

III. Research Method

3.1. Research Design

This study employs a quantitative research approach using a descriptive research design. This approach is intended to empirically examine the effects of profitability, liquidity, and leverage on financial distress. A quantitative descriptive design was selected because it enables financial phenomena to be objectively analyzed using numerical data and statistical techniques to examine the relationships among the research variables (Sugiyono, 2019).

3.2. Population and Sample

The population of this study consists of all manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. This period was selected to provide recent evidence from the post-COVID-19 recovery period. The sample was determined using a non-probability sampling method with a purposive sampling technique (Sugiyono, 2019). This approach was adopted because manufacturing companies have diverse financial characteristics, requiring sample selection based on specific research criteria. The sample selection criteria are as follows:

- Manufacturing companies consistently listed on the Indonesia Stock Exchange (IDX) during 2022–2024.
- Manufacturing companies that published annual reports consecutively in Indonesian Rupiah (IDR) throughout the study period.
- Manufacturing companies with complete financial data required to calculate all research variables.

The sample selection process is summarized in Table 1.

Table 1. Sample Selection Process

No.	Sample Selection Criteria	Number of Companies
1	Manufacturing companies listed on the IDX	61
2	Companies not consistently listed during 2022–2024	(5)
3	Companies that did not publish consecutive annual reports in Indonesian Rupiah (IDR)	(7)
4	Companies with incomplete financial data	(0)
Total Sample Companies		49

Based on these criteria, 49 manufacturing companies were selected as the final sample. Since the study covers a three-year period (2022–2024), the total dataset consists of 147 firm-year observations (49×3). The sample companies are presented in Table 2.

Table 2. List of Sample Companies

No.	Code	Company Name
1	ANTM	PT Aneka Tambang Tbk.
2	ARNA	Arwana Citramulia Tbk.
3	ASII	Astra International Tbk.
4	AUTO	Astra Otoparts Tbk.
5	AVIA	Avia Avian Tbk.
6	CARS	Bintraco Dharma Tbk.

7	CITA	Cita Mineral Investindo Tbk.
8	DRMA	Dharma Polimetal Tbk.
9	GJTL	Gajah Tunggal Tbk.
10	HRTA	Hartadinata Abadi Tbk.
11	IMPC	Impack Pratama Industri Tbk.
12	INTP	Indocement Tunggal Prakarsa Tbk.
13	ISSP	Steel Pipe Industry of Indonesia Tbk.
14	JTPE	Jasuindo Tiga Perkasa Tbk.
15	KBLI	KMI Wire & Cable Tbk.
16	MARK	Mark Dynamics Indonesia Tbk.
17	MLIA	Mulia Industrindo Tbk.
18	PBID	Panca Budi Idaman Tbk.
19	SAMF	Saraswanti Anugerah Makmur Tbk.
20	SMBR	Semen Baturaja (Persero) Tbk.
21	SMGR	Semen Indonesia (Persero) Tbk.
22	SMSM	Selamat Sempurna Tbk.
23	SPTO	Surya Pertiwi Tbk.
24	TINS	Timah Tbk.
25	UNTR	United Tractors Tbk.
26	WOOD	Integra Indocabinet Tbk.
27	WTON	Wijaya Karya Beton Tbk.
28	AISA	FKS Food Sejahtera Tbk.
29	BISI	BISI International Tbk.
30	BUDI	Budi Starch & Sweetener Tbk.
31	CPIN	Charoen Pokphand Indonesia Tbk.
32	DLTA	Delta Djakarta Tbk.
33	GGRM	Gudang Garam Tbk.
34	HMSP	H.M. Samporna Tbk.
35	ICBP	Indofood CBP Sukses Makmur Tbk.
36	INDF	Indofood Sukses Makmur Tbk.
37	JPFA	Japfa Comfeed Indonesia Tbk.
38	MAIN	Malindo Feedmill Tbk.
39	MLBI	Multi Bintang Indonesia Tbk.
40	MYOR	Mayora Indah Tbk.
41	ULTJ	Ultrajaya Milk Industry & Trading Company Tbk.
42	UNVR	Unilever Indonesia Tbk.
43	WIIM	Wismilak Inti Makmur Tbk.
44	CLEO	Sariguna Primatirta Tbk.
45	GOOD	Garudafood Putra Putri Jaya Tbk.
46	KEJU	Mulia Boga Raya Tbk.
47	UCID	Uni-Charm Indonesia Tbk.
48	VICI	Victoria Care Indonesia Tbk.
49	CMRY	Cisarua Mountain Dairy Tbk.

3.3. Data Type and Data Source

This study uses quantitative secondary data obtained from the audited annual financial statements of manufacturing companies listed on the Indonesia Stock Exchange (IDX). Rather than relying on pre-

calculated financial ratios published by the IDX, the study collected raw financial data directly from corporate financial reports. The collected financial data include net income, total assets, current assets, current liabilities, total liabilities, shareholders' equity, retained earnings, earnings before interest and taxes (EBIT), market value of equity, and sales revenue. These data were subsequently processed by the researcher using Microsoft Excel to calculate the research variables, namely Return on Assets (ROA), Current Ratio (CR), Debt-to-Equity Ratio (DER), and the Altman Z-Score, based on their respective measurement formulas.

3.4. Data Analysis Technique

This study employs a quantitative descriptive approach to examine the effects of profitability, liquidity, and leverage on financial distress. The data were analyzed using multiple linear regression analysis with the assistance of IBM SPSS software. SPSS was selected because it provides comprehensive statistical procedures, including classical assumption tests, the coefficient of determination, the F-test, and the t-test. The analysis began with data processing, followed by testing the regression assumptions, estimating the multiple regression model, and interpreting the results to determine whether profitability, liquidity, and leverage significantly affect financial distress among manufacturing companies during the 2022–2024 period.

3.4.1. Financial Distress Analysis

Financial distress was measured using the Altman Z-Score Model, which evaluates a company's financial condition and predicts the likelihood of bankruptcy. The Z-Score was calculated using financial statement data obtained from manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Following Rachmawati and Suprihhadi (2021) and Resfitasari et al. (2022), the model is expressed as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

Where:

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

Based on Cipta and Wibowo (2021), companies are classified into three categories according to their Z-Score:

1. $Z > 2.60$: Safe zone, indicating a healthy financial condition with a low probability of financial distress.
2. $1.10 < Z < 2.60$: Gray zone, indicating moderate financial risk in which the company may either recover or deteriorate depending on managerial decisions.
3. $Z < 1.10$: Distress zone, indicating severe financial difficulties and a high risk of bankruptcy.

3.4.2. Descriptive Statistics

Descriptive statistics were used to summarize the characteristics of the research data without drawing statistical inferences. The analysis includes the mean, median, standard deviation, minimum value, and maximum value, providing an overview of the distribution and variability of the research variables (Sugiyono, 2019).

3.4.3. Classical Assumption Tests

Classical assumption tests were conducted to ensure that the multiple regression model satisfies the assumptions required for producing Best Linear Unbiased Estimators (BLUE) (Zainuddin & Wardhana, 2024). These tests include the normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test.

a. Normality Test

The normality test evaluates whether the regression residuals are normally distributed. This study employs the Kolmogorov–Smirnov (K–S) test, in which residuals are considered normally distributed when the significance value (p-value) exceeds 0.05 (Ghozali, 2021).

b. Multicollinearity Test

The multicollinearity test examines whether strong correlations exist among the independent variables. Multicollinearity is considered absent when the Tolerance value is greater than 0.10 and the Variance Inflation Factor (VIF) is less than 10.00 (Ghozali, 2021).

c. Autocorrelation Test

The autocorrelation test determines whether the residuals are correlated across observations, particularly in time-series data. This study uses the Durbin–Watson (DW) test, where a DW statistic between 1.5 and 2.5 indicates that autocorrelation is not present (Ghozali, 2021).

d. Heteroscedasticity Test

The heteroscedasticity test examines whether the residual variance remains constant across observations. Heteroscedasticity was evaluated using both a scatterplot of standardized residuals against predicted values and the Glejser test. The regression model is considered free from heteroscedasticity when no systematic pattern appears in the scatterplot and the Glejser test produces a significance value greater than 0.05 (Ghozali, 2021).

3.4.4. Hypothesis Testing

a. Coefficient of Determination (R^2)

The coefficient of determination (R^2) measures the proportion of variation in the dependent variable explained by the independent variables. The value of R^2 ranges from 0 to 1, where values closer to 1 indicate greater explanatory power (Ghozali, 2021). Because R^2 tends to increase with the addition of explanatory variables, this study primarily refers to the Adjusted R^2 , which provides a more accurate estimate by accounting for the number of predictors included in the regression model (Ghozali, 2021).

b. t-Test

The t-test was conducted to evaluate the partial effect of each independent variable on financial distress. A regression coefficient is considered statistically significant when its p-value is less than 0.05, indicating that the corresponding independent variable has a significant individual effect on the dependent variable (Ghozali, 2021).

c. F-Test

The F-test was used to examine the simultaneous effect of profitability, liquidity, and leverage on financial distress. This test determines whether the overall regression model significantly explains the variation in the dependent variable and whether the independent variables jointly influence financial distress (Ghozali, 2021).

IV. Result and Discussion

4.1. Financial Distress Analysis

The empirical analysis of the financial vulnerability of manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 observation period was conducted using the Altman Z-Score Model. This model integrates several fundamental financial indicators, including liquidity, profitability, leverage, solvency, and asset utilization efficiency, to generate a single index that reflects a company's overall financial health. Based on the Altman Z-Score classification, companies are categorized into three theoretical zones: the distress zone ($Z < 1.10$), indicating a high risk of bankruptcy; the gray zone ($1.10 < Z < 2.60$), indicating financial uncertainty or moderate financial risk; and the safe zone ($Z > 2.60$), indicating sound financial performance and a low probability of insolvency. Based on the calculations for 49 manufacturing companies during the 2022–2024 period, the results are presented in Table 3.

Table 3. Altman Z-Score Results

No.	Code	Company Name	Year	Z-Score	Category
1	ANTM	Aneka Tambang Tbk.	2022	16,9177	Safe Zone
			2023	11,8947	Safe Zone
			2024	13,3237	Safe Zone
2	ARNA	Arwana Citramulia Tbk.	2022	17,5864	Safe Zone
			2023	15,3622	Safe Zone
			2024	14,5250	Safe Zone
3	ASII	Astra International Tbk.	2022	6,4714	Safe Zone
			2023	6,2886	Safe Zone
			2024	6,1320	Safe Zone
4	AUTO	Astra Otoparts Tbk.	2022	9,1059	Safe Zone
			2023	11,2263	Safe Zone
			2024	11,5374	Safe Zone
5	AVIA	Avia Avian Tbk.	2022	39,0229	Safe Zone
			2023	34,9977	Safe Zone
			2024	28,0454	Safe Zone
6	CARS	Bintraco Dharma Tbk.	2022	2,3095	Grey Zone
			2023	2,9160	Safe Zone
			2024	3,5443	Safe Zone
7	CITA	Cita Mineral Investindo Tbk.	2022	26,5436	Safe Zone
			2023	26,5472	Safe Zone
			2024	110,8624	Safe Zone
8	DRMA	Dharma Polimetal Tbk.	2022	12,1554	Safe Zone
			2023	13,5042	Safe Zone
			2024	12,4678	Safe Zone
9	GJTL	Gajah Tunggal Tbk.	2022	6,2020	Safe Zone
			2023	9,4874	Safe Zone
			2024	6,2904	Safe Zone
10	HRTA	Hartadinata Abadi Tbk.	2022	13,2722	Safe Zone
			2023	6,9257	Safe Zone
			2024	9,6966	Safe Zone
11	IMPC	Impack Pratama Industri Tbk.	2022	14,3581	Safe Zone
			2023	17,4599	Safe Zone

			2024	13,0317	Safe Zone
12	INTP	Indocement Tunggol Prakarsa Tbk.	2022	14,4920	Safe Zone
			2023	9,4848	Safe Zone
			2024	10,0889	Safe Zone
			2024	10,0889	Safe Zone
13	ISSP	Steel Pipe Industry of Indonesia Tbk.	2022	4,8705	Safe Zone
			2023	6,0854	Safe Zone
			2024	9,2478	Safe Zone
			2024	9,2478	Safe Zone
14	JTPE	Jasuindo Tiga Perkasa Tbk.	2022	8,6908	Safe Zone
			2023	8,7020	Safe Zone
			2024	7,4415	Safe Zone
			2024	7,4415	Safe Zone
15	KBLI	KMI Wire & Cable Tbk.	2022	39,4231	Safe Zone
			2023	31,2554	Safe Zone
			2024	44,9050	Safe Zone
			2024	44,9050	Safe Zone
16	MARK	Mark Dynamics Indonesia Tbk.	2022	39,5896	Safe Zone
			2023	44,4451	Safe Zone
			2024	63,9538	Safe Zone
			2024	63,9538	Safe Zone
17	MLIA	Mulia Industrindo Tbk	2022	9,3654	Safe Zone
			2023	9,1289	Safe Zone
			2024	10,3539	Safe Zone
			2024	10,3539	Safe Zone
18	PBID	Panca Budi Idaman Tbk.	2022	23,9906	Safe Zone
			2023	24,3812	Safe Zone
			2024	25,7971	Safe Zone
			2024	25,7971	Safe Zone
19	SAMF	Saraswanti Anugerah Makmur Tbk	2022	4,1065	Safe Zone
			2023	7,6989	Safe Zone
			2024	10,0889	Safe Zone
			2024	10,0889	Safe Zone
20	SMBR	Semen Baturaja (Persero) Tbk.	2022	7,5953	Safe Zone
			2023	6,3249	Safe Zone
			2024	5,9067	Safe Zone
			2024	5,9067	Safe Zone
21	SMGR	Semen Indonesia (Persero) Tbk.	2022	8,4252	Safe Zone
			2023	6,9813	Safe Zone
			2024	7,5752	Safe Zone
			2024	7,5752	Safe Zone
22	SMSM	Selamat Sempurna Tbk.	2022	26,7420	Safe Zone
			2023	31,9250	Safe Zone
			2024	28,1600	Safe Zone
			2024	28,1600	Safe Zone
23	SPTO	Surya Pertiwi Tbk.	2022	6,2884	Safe Zone
			2023	7,0166	Safe Zone
			2024	7,7454	Safe Zone
			2024	7,7454	Safe Zone
24	TINS	Timah Tbk.	2022	12,1525	Safe Zone
			2023	4,6504	Safe Zone
			2024	11,3668	Safe Zone
			2024	11,3668	Safe Zone
25	UNTR	United Tractors Tbk.	2022	9,2888	Safe Zone
			2023	8,1114	Safe Zone
			2024	8,3202	Safe Zone
			2024	8,3202	Safe Zone
26	WOOD	Integra Indocabinet Tbk.	2022	6,3435	Safe Zone
			2023	3,4040	Safe Zone
			2024	3,5082	Safe Zone
			2024	3,5082	Safe Zone
27	WTON	Wijaya Karya Beton Tbk.	2022	1,9475	Grey Zone

			2023	2,1257	Grey Zone
			2024	2,9420	Safe Zone
28	AISA	FKS Food Sejahtera Tbk.	2022	4,8980	Safe Zone
			2023	5,8242	Safe Zone
			2024	8,0247	Safe Zone
29	BISI	BISI International Tbk.	2022	42,9294	Safe Zone
			2023	35,1581	Safe Zone
			2024	55,6628	Safe Zone
30	BUDI	Budi Starch & Sweetener Tbk.	2022	5,1403	Safe Zone
			2023	5,7068	Safe Zone
			2024	4,6091	Safe Zone
31	CPIN	Charoen Pokphand Indonesia Tbk	2022	15,2502	Safe Zone
			2023	13,9319	Safe Zone
			2024	19,7207	Safe Zone
32	DLTA	Delta Djakarta Tbk.	2022	22,2474	Safe Zone
			2023	23,0917	Safe Zone
			2024	19,0960	Safe Zone
33	GGRM	Gudang Garam Tbk.	2022	9,0909	Safe Zone
			2023	9,2019	Safe Zone
			2024	11,1976	Safe Zone
34	HMSP	H.M. Sampoerna Tbk.	2022	8,7745	Safe Zone
			2023	9,9325	Safe Zone
			2024	8,7609	Safe Zone
35	ICBP	Indofood CBP Sukses Makmur Tbk	2022	16,1603	Safe Zone
			2023	18,0345	Safe Zone
			2024	19,3556	Safe Zone
36	INDF	Indofood Sukses Makmur Tbk.	2022	7,8274	Safe Zone
			2023	8,0473	Safe Zone
			2024	8,1233	Safe Zone
37	JPFA	Japfa Comfeed Indonesia Tbk.	2022	8,6936	Safe Zone
			2023	7,6130	Safe Zone
			2024	10,8358	Safe Zone
38	MAIN	Malindo Feedmill Tbk.	2022	5,6152	Safe Zone
			2023	6,3796	Safe Zone
			2024	10,9161	Safe Zone
39	MLBI	Multi Bintang Indonesia Tbk.	2022	8,2938	Safe Zone
			2023	9,6206	Safe Zone
			2024	8,1072	Safe Zone
40	MYOR	Mayora Indah Tbk.	2022	15,1186	Safe Zone
			2023	22,7051	Safe Zone
			2024	14,3032	Safe Zone
41	ULTJ	Ultrajaya Milk Industry & Trading Company Tbk.	2022	22,6924	Safe Zone
			2023	47,1695	Safe Zone
			2024	40,7252	Safe Zone
42	WIIM	Wismilak Inti Makmur Tbk.	2022	12,3558	Safe Zone
			2023	17,2351	Safe Zone
			2024	10,1272	Safe Zone

43	CLEO	Sariguna Primatirta Tbk.	2022	20,4399	Safe Zone
			2023	17,0418	Safe Zone
			2024	32,0294	Safe Zone
44	GOOD	Garudafood Putra Putri Jaya Tbk.	2022	11,7202	Safe Zone
			2023	11,8125	Safe Zone
			2024	9,1747	Safe Zone
45	KEJU	Mulia Boga Raya Tbk.	2022	24,9459	Safe Zone
			2023	22,1145	Safe Zone
			2024	15,7215	Safe Zone
46	UCID	Uni-Charm Indonesia Tbk.	2022	7,8982	Safe Zone
			2023	9,1433	Safe Zone
			2024	8,8744	Safe Zone
47	VICI	Victoria Care Indonesia Tbk.	2022	15,7403	Safe Zone
			2023	31,8025	Safe Zone
			2024	31,7479	Safe Zone
48	CMRY	Cisarua Mountain Dairy Tbk.	2022	38,0474	Safe Zone
			2023	35,2119	Safe Zone
			2024	33,5174	Safe Zone
49	UNVR	Unilever Indonesia Tbk.	2022	12,2083	Safe Zone
			2023	10,7970	Safe Zone
			2024	6,5830	Safe Zone

Based on the analysis of 49 manufacturing companies comprising 147 firm-year observations during the 2022–2024 period, the results indicate a generally positive and stable pattern of financial performance. The majority of the sampled companies consistently remained in the safe zone throughout the three-year observation period, suggesting that the risk of bankruptcy among manufacturing companies was relatively low. No company was classified in the distress zone during the study period. Only two companies were classified in the gray zone. Bintraco Dharma Tbk. (CARS) recorded a Z-Score of 2.3095 in 2022 but improved to the safe zone in both 2023 and 2024. Similarly, Wijaya Karya Beton Tbk. (WTON) remained in the gray zone in 2022 ($Z = 1.9475$) and 2023 ($Z = 2.1257$) before improving to the safe zone in 2024 ($Z = 2.9420$). These improvements indicate a stronger financial structure and better operating performance. Several companies consistently achieved exceptionally high Z-Scores throughout the observation period, including Avia Avian Tbk. (AVIA), Mark Dynamics Indonesia Tbk. (MARK), BISI International Tbk. (BISI), Ultrajaya Milk Industry & Trading Company Tbk. (ULTJ), and Cisarua Mountain Dairy Tbk. (CMRY). Their consistently high Z-Scores reflect strong profitability, liquidity, and efficient asset utilization, indicating excellent financial health and a very low likelihood of financial distress. Although several companies, such as Aneka Tambang Tbk. (ANTM), Timah Tbk. (TINS), and Unilever Indonesia Tbk. (UNVR), experienced fluctuations in their Z-Scores over the study period, they consistently remained within the safe zone. These fluctuations may reflect changes in commodity prices, market conditions, or operational performance rather than indicating a deterioration in financial health or an increased bankruptcy risk. Overall, the findings demonstrate that the manufacturing companies included in this study maintained strong financial resilience throughout the 2022–2024 period. The predominance of companies within the safe zone indicates that they were generally capable of meeting both short-term and long-term financial obligations while maintaining stable business operations despite domestic and global macroeconomic uncertainties.

4.2. Descriptive Statistical Analysis

Table 4. Descriptive Statistics Results

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Return on Assets (ROA)	147	-.04	.33	.1037	.07470
Current Ratio (CR)		.45	13.40	2.6786	2.12943
Debt-to-Equity Ratio (DER)		.04	6.47	.7856	.83442
Altman Z-Score		1.40	10.53	3.7186	1.45870
Valid N (listwise)					

Descriptive statistical analysis was conducted to describe the distribution and variability of the data for each research variable based on 147 observations from manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. For the profitability variable, measured using Return on Assets (ROA), the minimum value was –0.04, recorded by PT Timah Tbk. (TINS) in 2023. This negative value indicates operational losses that resulted in a net loss during the fiscal year. Conversely, the highest ROA of 0.33 was achieved by PT Multi Bintang Indonesia Tbk. (MLBI) in 2024, reflecting excellent profitability and highly efficient asset utilization. The sample's mean ROA was 0.1037, indicating that, on average, manufacturing companies generated a net return of 10.37% on their total assets. For the liquidity variable, represented by the Current Ratio (CR), the minimum value of 0.45 was recorded by PT Unilever Indonesia Tbk. (UNVR) in 2024, indicating that the company's current assets were insufficient to fully cover its short-term liabilities. In contrast, PT BISI International Tbk. (BISI) reported the highest Current Ratio of 13.40 in 2024, reflecting a very strong working capital position and substantial short-term liquidity. The average Current Ratio was 2.6786, suggesting that, overall, manufacturing companies maintained sufficient current assets to meet their short-term financial obligations.

For the leverage variable, measured using the Debt-to-Equity Ratio (DER), the minimum value of 0.04 was reported by PT Dharma Polimetal Tbk. (DRMA) in 2024, indicating a highly conservative capital structure with minimal reliance on debt financing relative to equity. Conversely, PT Unilever Indonesia Tbk. (UNVR) recorded the highest DER of 6.47 in 2024, reflecting a highly leveraged capital structure and significant dependence on external financing. The mean DER was 0.7856, indicating that, on average, the manufacturing companies listed on the IDX maintained a moderate level of leverage. Regarding the financial distress variable, measured using the Altman Z-Score, the minimum value of 1.95 was recorded by PT Wijaya Karya Beton Tbk. (WTON) in 2022. This score placed the company in the grey zone, indicating potential financial difficulties and an elevated risk of financial distress. In contrast, the highest Z-Score of 110.8624 was achieved by PT Cita Mineral Investindo Tbk. (CITA) in 2024, reflecting an exceptionally strong financial condition. The sample's average Z-Score was 15.9410, confirming that, overall, the manufacturing companies included in this study were classified within the safe zone. The variation observed in these descriptive statistics provides a reliable empirical foundation for the subsequent inferential and associative analyses.

4.3. Classical Assumption Tests

a. Normality Test

Table 5. Normality Test Results

One-Sample Kolmogorov–Smirnov		
		Unstandardized Residual
N		147
Normal Parameters ^{a, b}	Mean	.0000000
	Std. Deviation	.13677753
Most Extreme Differences	Absolute	.059

	Positive	.059
	Negative	-.040
Test Statistic		.059
Asymp. Sig. (2-tailed)		200 ^{c, d}
a. Test distribution is Normal. b. Calculated from data. c. Lilliefors Significance Correction d. This is a lower bound of the true significance.		

The normality assumption was examined using the One-Sample Kolmogorov–Smirnov (K–S) test based on the model's unstandardized residuals. The test results indicate an Asymp. Sig. (2-tailed) value of 0.200. Since this probability value exceeds the significance threshold of 0.05, it can be concluded that the residuals are normally distributed. This finding is further supported by the Kolmogorov–Smirnov test statistic of 0.059, indicating that the absolute deviation of the residual distribution from the theoretical normal distribution is relatively small. Furthermore, the residuals have a mean value of 0.0000000, demonstrating the absence of systematic bias in the regression model. Therefore, the normality assumption has been satisfied, and the regression model is appropriate for subsequent inferential analyses.

b. Multicollinearity Test

Table 6. Multicollinearity Test Results

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	ROA	.943	1.060
	CR	.561	1.939
	DER	.533	1.876
a. Dependent Variable: Z_SCORE			

The multicollinearity test was performed by examining the Tolerance and Variance Inflation Factor (VIF) values to ensure that no severe linear correlation existed among the independent variables. The results show that the profitability variable (ROA) has a Tolerance value of 0.943 and a VIF value of 1.060. The liquidity variable (CR) records a Tolerance value of 0.516 and a VIF value of 1.939, while the leverage variable (DER) has a Tolerance value of 0.533 and a VIF value of 1.876. Since all independent variables consistently exhibit Tolerance values greater than 0.10 and VIF values below 10.00, it can be concluded that the regression model is free from multicollinearity. These results indicate that the independent variables do not exhibit strong linear relationships with one another, allowing each variable to contribute independently to explaining variations in the dependent variable.

c. Autocorrelation Test

Table 7. Autocorrelation Test Results

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	.923 ^a	.853	.850	.13820	.892
a. Predictors: (Constant), DER, ROA, CR					
b. Dependent Variable: Z_SCORE					

The presence of autocorrelation among the residuals was examined using the Durbin–Watson (DW) test. Based on 147 observations ($n = 147$) and three independent variables ($k = 3$), the Durbin–Watson critical value table at the 5% significance level indicates a lower critical value (d_L) of 1.66 and an upper critical value (d_U) of 1.78. The regression results produced a Durbin–Watson statistic of 0.892. Since the calculated DW value (0.892) is lower than the lower critical value (1.66), the model exhibits positive autocorrelation among the residuals. This finding indicates that the residuals are correlated across observations, thereby violating the independence assumption of the classical linear regression model. Consequently, the presence of positive autocorrelation should be considered a limitation when interpreting the estimated regression coefficients and the overall regression results.

d. Heteroscedasticity Test

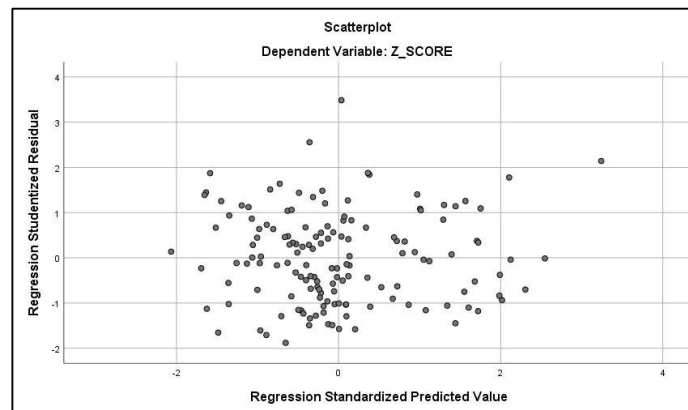


Figure 3. Heteroscedasticity Test Results Using a Scatterplot

The heteroscedasticity assumption was evaluated using a scatterplot of the Regression Standardized Predicted Values against the Regression Studentized Residuals. The scatterplot shows that the residuals are randomly dispersed both above and below the zero line on the Y-axis without forming any discernible pattern, such as a funnel shape, a widening or narrowing distribution, or a systematic wave-like pattern. Furthermore, the data points are relatively evenly distributed across the range of predicted values. This random distribution indicates that the variance of the residuals remains relatively constant at different levels of the predicted values, suggesting the absence of heteroscedasticity in the regression model. Therefore, it can be concluded that the model satisfies the homoscedasticity assumption, indicating that the residual variance is constant and that the regression model is appropriate for subsequent hypothesis testing.

4.4. Hypothesis Testing

a. Coefficient of Determination (R^2) Test

Table 8. Coefficient of Determination (R^2) Test Results

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923 ^a	.853	.850	.13820
a. Predictors: (Constant), DER, ROA, CR				
b. Dependent Variable: Z_SCORE				

Based on the estimation results presented in the Model Summary table, the R Square (R^2) value is 0.853, while the Adjusted R Square is 0.850. The Adjusted R Square value of 0.850 indicates that 85% of the variation in financial distress (Altman Z-Score) can be explained by the combined effects of profitability (ROA), liquidity (CR), and leverage (DER). The remaining 15% of the variation is attributable to other factors outside the conceptual framework of this study. Furthermore, the R value of 0.923 indicates a very strong positive relationship between the independent variables and the dependent variable, demonstrating that the regression model has a high level of explanatory power.

b. t-Test

Table 9. t-Test Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.101	.078		14.148	.000
	ROA	1.211	.103	.390	11.812	.000
	CR	.388	.029	.588	13.160	.000
	DER	-.213	.044	-.215	-4.892	.000

a. Dependent Variable: Z_SCORE

The partial significance test for each independent variable produced the following results:

- 1) The profitability variable, measured by Return on Assets (ROA), has a regression coefficient of 1.211 with a significance value of 0.000, which is below the 0.05 significance level. This result indicates that ROA has a positive and statistically significant effect on the Altman Z-Score. Since a higher Z-Score reflects a lower probability of financial distress, an increase in profitability significantly improves the company's financial condition and reduces the likelihood of financial distress. Therefore, this finding provides empirical support for the first hypothesis (H1).
- 2) The liquidity variable, measured by the Current Ratio (CR), has a regression coefficient of 0.388 with a significance value of 0.000, which is also below the 0.05 threshold. This finding indicates that liquidity has a positive and significant effect on the Altman Z-Score. An improvement in the company's liquidity position increases the Z-Score, implying a lower risk of financial distress. Consequently, the empirical evidence supports the second hypothesis (H2).
- 3) The leverage variable, measured by the Debt-to-Equity Ratio (DER), has a negative regression coefficient of -0.213 with a significance value of 0.000, indicating statistical significance at the 5% level. This result confirms that leverage has a negative and significant effect on the Altman Z-Score. An increase in leverage reduces the Z-Score, thereby increasing the company's vulnerability to financial distress. Accordingly, higher debt levels significantly increase the risk of financial distress. Therefore, this finding provides empirical support for the third hypothesis (H3).

c. F-Test

Table 10. F-Test Results

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.820	3	5.273	276.089	.000 ^b
	Residual	2.731	143	.019		
	Total	18.552	146			

- | |
|---|
| <p>a. Dependent Variable: Z_SCORE
b. Predictors: (Constant), DER, ROA, CR</p> |
|---|

Based on the ANOVA table, the regression model produces an F-statistic of 276.089 with a significance value of 0.000. Since the significance level is well below the 0.05 threshold, it can be concluded that profitability (ROA), liquidity (CR), and leverage (DER) simultaneously have a statistically significant effect on financial distress (Altman Z-Score). These findings confirm that the proposed multiple linear regression model is statistically significant and demonstrates a high degree of goodness-of-fit. Therefore, the model is appropriate and reliable for explaining and predicting the financial distress of manufacturing companies listed on the Indonesia Stock Exchange during the 2022–2024 period.

4.5. Discussion

a. The Effect of Profitability on Financial Distress

The regression analysis indicates that profitability, measured by Return on Assets (ROA), has a regression coefficient of 1.211 with a significance level of 0.000 ($p < 0.05$). This result indicates that profitability has a positive and statistically significant effect on the Altman Z-Score. Since the Z-Score is used as a proxy for financial distress in this study, where a higher Z-Score reflects a healthier financial condition and a lower risk of financial distress, an increase in profitability directly reduces the likelihood of financial distress. Therefore, these empirical findings support the first hypothesis (H1), which proposes that profitability has a negative effect on financial distress among manufacturing companies listed on the Indonesia Stock Exchange (IDX). From a theoretical perspective, these findings confirm the fundamental concept of profitability as an indicator of a company's effectiveness in converting its assets and economic resources into net income. Ogachi and Zoltan (2020) argue that profitability reflects a firm's operational efficiency in creating economic value. Similarly, Kasmir (2019) states that profitability is a crucial indicator for evaluating a company's financial stability. Firms with higher profitability generally possess stronger cash flow positions and greater capacity to meet both short-term and long-term financial obligations, thereby reducing their vulnerability to financial distress.

These findings are also consistent with Signalling Theory proposed by Spence (1973). According to this theory, high profitability serves as a positive signal (good news) to investors and creditors regarding a company's future prospects. Strong profitability indicates that management is capable of utilizing corporate assets efficiently to generate sufficient earnings to finance operations and fulfill financial commitments. Conversely, declining profitability sends a negative signal (bad news), raising concerns among stakeholders about the firm's ability to continue operating as a going concern. Consequently, companies with stronger profitability are less likely to experience financial distress. The empirical evidence of this study is consistent with the findings of Baghaskara and Retnani (2023), Ratuela et al. (2022), and Sihombing and Angela (2024), all of whom concluded that profitability has a significant negative relationship with financial distress. These studies suggest that higher profitability serves as a financial buffer that protects firms from the risk of bankruptcy. However, the findings differ from those of Ardi et al. (2020) and Rachmawati and Suprihhadi (2021), who reported that profitability has no significant effect on financial distress. Furthermore, this study contradicts the international evidence reported by Oktavian and Handoyo (2023), who found a positive relationship between profitability and financial distress. These inconsistencies may be attributed to differences in observation periods, sample characteristics, macroeconomic conditions, industrial settings, and the financial distress measurement models employed across studies.

b. The Effect of Liquidity on Financial Distress

Based on the regression results, the liquidity variable, represented by the Current Ratio (CR), has a regression coefficient of 0.388 with a significance value of 0.000 ($p < 0.05$). These statistical results indicate that liquidity has a positive and statistically significant effect on the Altman Z-Score. Since a higher Z-Score

reflects stronger solvency and better financial health, an increase in liquidity leads to a higher Z-Score, thereby reducing the probability of financial distress. Accordingly, these findings support the second hypothesis (H2), which states that liquidity has a negative effect on financial distress. Conceptually, liquidity reflects a company's ability to meet its short-term obligations as they become due. Thottoli (2021) explains that the Current Ratio measures the extent to which current assets are sufficient to cover current liabilities. Similarly, Nurunnabi (2021) argues that a strong Current Ratio indicates a sound financial position capable of supporting the company's daily operational activities. From the perspective of Signalling Theory (Spence, 1973), a high level of liquidity serves as a positive signal to investors and creditors because it reflects effective working capital management and a strong ability to meet short-term financial commitments. Conversely, a substantial decline in liquidity serves as an early warning signal of potential liquidity constraints, which may eventually lead to financial distress or bankruptcy. The findings of this study are consistent with those reported by Ratuela et al. (2022), Ardi et al. (2020), Rachmawati and Suprihadi (2021), and Bukhori et al. (2022), all of whom found that higher liquidity significantly reduces the risk of financial distress. However, these findings differ from those of Baghaskara and Retnani (2023), Kuntari and Machmuddah (2022), and Sihombing and Angela (2024), who concluded that liquidity has no significant effect on financial distress. These inconsistencies may be attributed to differences in the observation period, industry characteristics, macroeconomic conditions, monetary policies, and variations in the capital structures of the sampled companies.

c. The Effect of Leverage on Financial Distress

The regression analysis indicates that leverage, measured by the Debt-to-Equity Ratio (DER), has a regression coefficient of -0.213 with a significance value of 0.000 ($p < 0.05$). This result confirms that leverage has a negative and statistically significant effect on the Altman Z-Score. According to the Altman Z-Score model, a lower Z-Score indicates that a company is moving closer to financial distress or bankruptcy. Therefore, an increase in leverage reduces the Z-Score, thereby increasing the likelihood of financial distress. Consequently, these findings support the third hypothesis (H3), which states that leverage has a positive effect on financial distress among manufacturing companies listed on the Indonesia Stock Exchange (IDX). From a theoretical perspective, leverage measures the extent to which a company's operations are financed through external debt rather than internal equity. Kasmir (2019) explains that leverage, or solvency, ratios reflect a company's ability to fulfill both its short-term and long-term financial obligations. Hery (2018) further argues that debt financing can enhance profitability through the financial leverage effect by increasing the potential return on equity. However, excessive reliance on debt simultaneously increases financial risk, particularly when operating cash flows are insufficient to cover fixed financial obligations such as interest expenses and principal repayments. Within the framework of Signalling Theory (Spence, 1973), a high leverage ratio conveys a negative signal to investors and creditors because it reflects a heavier financial burden and a greater likelihood of default. The empirical findings of this study are consistent with those of Jannah et al. (2021), Octavia et al. (2021), Bukhori et al. (2022), Kuntari and Machmuddah (2022), Ratuela et al. (2022), Baghaskara and Retnani (2023), and Sihombing and Angela (2024), all of whom concluded that a high level of debt significantly increases the risk of financial distress. However, these findings differ from those reported by Ardi et al. (2020) and Rachmawati and Suprihadi (2021), who found that leverage has no significant effect on financial distress. In addition, this study contradicts the international findings of Oktavian and Handoyo (2023), who reported a negative relationship between leverage and financial distress. These inconsistencies are likely attributable to differences in research methodologies, observation periods, macroeconomic conditions, regulatory environments, and the financial distress proxies adopted across studies.

V. Conclusion

This study examined the effects of profitability, liquidity, and leverage on financial distress among manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Based on the empirical findings and statistical analyses presented in the previous chapter, it can be concluded that

profitability has a significant negative effect on financial distress. Since financial distress in this study is measured using the Altman Z-Score, an increase in profitability leads to a higher Z-Score, indicating a lower probability of financial distress. These findings suggest that greater profitability enhances a company's financial resilience by strengthening its capacity to generate earnings, maintain operational continuity, and meet both short-term and long-term financial obligations. Consequently, profitability serves as an important financial buffer against the risk of insolvency. The results also demonstrate that liquidity has a significant negative relationship with financial distress. Companies with stronger liquidity positions are better able to meet their short-term obligations, thereby reducing their vulnerability to financial difficulties. Adequate liquid assets not only reflect a healthy working capital structure but also support the sustainability of business operations over the long term. In contrast, leverage is found to have a significant positive effect on financial distress. A higher proportion of debt financing reduces the Altman Z-Score, indicating a greater likelihood of financial distress. Excessive reliance on external debt increases fixed financial obligations, including interest expenses and principal repayments, thereby exposing firms to greater financial risk. Furthermore, the simultaneous testing results reveal that profitability, liquidity, and leverage jointly have a significant effect on financial distress. The findings of the F-test confirm that these three financial ratios collectively provide valuable information for assessing corporate financial health and predicting the likelihood of financial distress. Overall, this study confirms that financial performance, as reflected in profitability, liquidity, and leverage ratios, represents a significant determinant of financial distress among manufacturing companies listed on the Indonesia Stock Exchange.

Despite its contributions, this study has several limitations that should be acknowledged. First, the observation period is relatively short, covering only three fiscal years (2022–2024), which may limit the ability to capture long-term financial trends and cyclical economic changes. In addition, the study focuses solely on three firm-level financial ratios as independent variables. Other potential determinants of financial distress, such as firm size, sales growth, operating cash flow, corporate governance mechanisms, and macroeconomic variables including inflation and interest rates, were not incorporated into the research model. Second, financial distress was measured exclusively using the Altman Z-Score model. Consequently, the findings may differ if alternative bankruptcy prediction models, such as the Springate S-Score, Grover G-Score, or Zmijewski X-Score, are employed. Considering these limitations, several recommendations can be proposed for future research. Future studies are encouraged to extend the observation period to obtain a more comprehensive understanding of financial distress trends while reducing potential short-term bias. Researchers should also consider expanding the research model by incorporating additional explanatory variables, including operating cash flow, firm size, sales performance, and corporate governance practices, to improve the explanatory power of the model. Furthermore, future studies are recommended to compare or integrate multiple financial distress prediction models, such as the Altman, Springate, Grover, and Zmijewski models, to produce more robust findings and enhance the reliability and generalizability of the research results.

References

- Adi, S. W., Putri, W. A. P., & Permatasari, W. D. (2020). Profitability, Leverage, Firm Size, Liquidity, and Total Assets Turnover on Liquidity, and Total Assets Turnover on Real Earnings Management (An Empirical Study on the Mining Company Classification Study on the Mining). *Riset Akuntansi Dan Keuangan Indonesia*, 5 (2), 129–140. <https://doi.org/10.23917/reaksi.v5i2.12403>
- Angela, S. &. (2024). Pengaruh Profitabilitas, Financial Leverage dan Likuiditas terhadap Financial Distress pada Perusahaan Food and Beverage di Indonesia. *JAFTA : Jurnal Akuntansi, Fakultas Hukum Dan Bisnis Digital*, 6 (1)(9), 85–101. <https://doi.org/10.32670/fairvalue.v4i9.1583>
- Ardi, M. F. S., Desmintari, & Yetty, F. (2020). Analysis of Financial Performance Against Financial Distress in Textile and Garment Companies on the IDX. *Jurnal Ilmiah Akuntansi Kesatuan*, 8(3), 309–318.
- Baghaskara, N., & Retnani, E. D. (2023). Pengaruh Profitabilitas, Likuiditas, Leverage, Dan Size Terhadap Financial Distress Perusahaan Manufaktur. *Jurnal Ilmu Dan Riset Akuntansi*, 12(2), 1–17.

- Bukhori, I., Kusumawati, R., & Meilani, M. (2022). Prediction of Financial Distress in Manufacturing Companies: Evidence from Indonesia. *Journal of Accounting and Investment*, 23(3), 588–605. <https://doi.org/10.18196/jai.v23i3.15217>
- Brigham, E. F., & Houston, J. F. (2021). *Dasar-Dasar Manajemen Keuangan*. Jakarta: Salemba Empat.
- Cipta, R. S., & Wibowo, D. (2021). Analisa Financial Distress Menggunakan Metode Altman (Z-Score) Untuk Memprediksi Kebangkrutan (Pada Perusahaan Pelayaran Terdaftar Bei 2016-2019). *JIMEN: Jurnal Inovatif Mahasiswa Manajemen*, 1(2), 124–138.
- Ghozali. (2021). *Aplikasi Analisis Multivariate dengan Program IBM SPSS 21*. Badan Penerbit UNDIP.
- Hahn & Reimsbach. (2020). Strategies for Organizational Legitimacy in the Context of Corporate Social Responsibility Reporting. *Accounting, Auditing & Accountability Journal*, 33(7), 1631–1659.
- Hery. (2018). *Analisis Laporan Keuangan*. Grasindo.
- Irawan, J. L. (2023). *Manajemen Keuangan Perusahaan Lanjutan*. PT. Sada Kurnia Pustaka.
- Inggamal, A. (2022). Analysis Financial Ratios on Financial Distress of Transportation Company Listed on Indonesian Stock Exchange in 2017-2020 Period. S1 thesis, Universitas Muhammadiyah Yogyakarta.
- Jannah, A. M., Dhiba, Z. F., & Safrida, E. (2021). Pengaruh Struktur Kepemilikan, Likuiditas Dan Leverage terhadap Financial Distress pada perusahaan manufaktur di Bei. *JAKP: Akuntansi, Keuangan Dan Perpajakan*, 4(1), 15–25.
- Kasmir. (2019). *Analisis Laporan Keuangan*. Rajawali Pers.
- Kason, Angkasa, C., Gozali, Y., Wijaya, R. A., & Hutahean, T. F. (2020). Analisis Perbandingan Keakuratan Memprediksi Financial Distress dengan Menggunakan Model Grover, Springate dan Altman Z-Score pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia pada Tahun 2013-2017. *Jurnal Ilmiah MEA (Manajemen, Ekonomi, Dan Akuntansi)*, 4(3), 441–458.
- Kisman, Z., & Krisandi, D. (2019). How to Predict Financial Distress in the Wholesale Sector: Lesson from Indonesian Stock Exchange. *Journal of Economics and Business*, 2(3), 569–585.
- Kuntari, S. E., & Machmuddah, Z. (2022). Pengaruh Rasio Likuiditas Dan Leverage Terhadap Financial Distress Dengan Rasio Profitabilitas Sebagai Pemoderasi. *Dinamika Akuntansi Keuangan Dan Perbankan*, 10(2), 145–155. <https://doi.org/10.35315/dakp.v10i2.8880>
- Masdiyanti, P. R., & Warasniasih, N. M. S. (2020). Laporan Keuangan dan Prediksi Kebangkrutan Perusahaan. *Jurnal Ilmiah Akuntansi*, 5(1), 196. <https://doi.org/10.23887/jia.v5i1.25119>
- Nurunnabi, M. (2021). Implementation of International Financial Reporting Standards (IFRS) in Developing Countries. In M. Nurunnabi (Ed.), *International Financial Reporting Standards Implementation: A Global Experience* (p. 0). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-80117-440-420211002>
- Octavia, E., Abdu, M., & Ginting, A. F. (2021). The Effect Of Liquidity And Leverage On Financial Distress (Study On Idx Food And Beverage Sub-Sector Manufacturing Companies For The 2015 - 2020 Period). *Review of International Geographical Education Online*, 11(6), 643–651. <https://doi.org/10.48047/rigeo.11.06.80>
- Ogachi, D., & Zoltan, Z. (2020). Corporate social responsibility and firm value protection. *International Journal of Financial Studies*, 8(4), 72.
- Oktavian, E., & Handoyo, S. (2023). Effect of Leverage, Profitability, Liquidity Ratio, and Inflation towards Financial Distress. *International Journal of Management Science and Application*, 2(1), 11–27. <https://doi.org/10.58291/ijmsa.v2i1.111>
- Putra, B. A. I., & Sunarto, S. (2021). Pengaruh Profitabilitas, Leverage, dan Kepemilikan Manajerial Terhadap Nilai Perusahaan dengan Corporate Social Responsibility Sebagai Variabel Moderasi. *Ekonomis: Journal of Economics and Business*, 5(1), 149–157.
- Rachmawati, A. J., & Suprihadi, H. (2021). Pengaruh Likuiditas, Leverage, Dan Sales Growth Terhadap Financial Distress Pada Perusahaan Tekstil Dan Garmen Yang Terdaftar di BEI 2013-2019. *Jurnal Ilmu Dan Riset Manajemen*, 10(4), 1–17. <http://jurnalmahasiswa.stiesia.ac.id/index.php/jirm/article/view/3961>

- Ratuela, G. J., Kalangi, L., & Warongan, J. D. L. (2022). Pengaruh Profitabilitas, Sales Growth, Likuiditas, dan Leverage Terhadap Financial Distress pada Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia Tahun 2018 – 2020. *Jurnal Riset Akuntansi Dan Auditing "GOODWILL,"* 13(1), 113–125.
- Resfitasari, E., Taofik Muhammad Gumelar, Andini Ulhaq, & Nina Rusmayanti. (2022). Analisis Prediksi Financial Distress Dengan Metode Altman Z-Score Pada PT. Waskita Karya Tbk. *Jurnal Aktiva : Riset Akuntansi Dan Keuangan*, 3(3), 131–140. <https://doi.org/10.52005/aktiva.v3i3.123>
- Salim, M. N., & Ismudjoko, D. (2021). An Analysis of Financial Distress Accuracy Models in Indonesia Coal Mining Industry: An Altman, Springate, Zmijewski, Ohlson and Grover Approaches. *Journal of Economics, Finance and Accounting Studies*, 3(2), 01–12. <https://doi.org/10.32996/jefas.2021.3.2.1>
- Spence, M. (1973). Job Market Signaling. *The Quarterly Journal of Economics*, 87(3), 355–374.
- Subramanyam. (2017). Analisis Laporan Keuangan (edisi ke-2). Salemba Empat.
- Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, dan R&D (Cetakan ke). Penerbit Alfabeta Bandung.
- Thottoli, M. M. (2021). The relevance of compliance audit on companies' compliance with disclosure guidelines of financial statements. *Journal of Investment Compliance*, 22(2), 137–150. <https://doi.org/10.1108/JOIC-12-2020-0047>
- Zainuddin, Iba & Wardhana, A. (2024). Analisis Regresi & Analisis Jalur Untuk Riset Bisnis Menggunakan SPSS 29.0 & SMART-PLS 4.0 (Cetakan Pe). Eureka Media Aksara.