Financial distress analysis using the Altman Z-Score method at CV Arthatex for the period 2022-2024

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Abstract

Financial distress is a condition of financial difficulty experienced by a company before it reaches the stage of bankruptcy. One effective method for the early detection of this condition is the Altman Z-Score model. Early detection of financial distress is crucial for management to implement strategic measures to ensure business sustainability. This research aims to analyze the level of financial distress and bankruptcy potential at CV Arthatex during the 2022–2024 period using the Modified Altman Z-Score method. This study employs a quantitative descriptive approach, utilizing secondary data from CV Arthatex's financial statements, consisting of the balance sheets and income statements for the 2022–2024 period. The results indicate that in 2022 CV Arthatex was in a healthy financial condition (safe zone) with a Z-Score of 4.34, posing no risk of bankruptcy. However, in 2023 and 2024, the Z-Score drastically decreased to -50.22 and -72.80, respectively, placing the company in the distress zone and indicating a high potential for bankruptcy. This study proves that the Altman Z-Score method can be utilized as an effective early warning system for assessing a company's bankruptcy risk. The findings are expected to serve as a reference for the management of CV Arthatex in making strategic decisions to improve its financial condition and prevent bankruptcy.

Keywords: *Financial Distress, Bankruptcy, Altman Z-Score, CV Arthatex.*

INTRODUCTION

The textile and textile products (TPT) industry in Indonesia is currently facing one of the most critical periods in its history. Global economic instability, declining export demand, and the influx of low-priced imported products have created a "perfect storm" that threatens the survival of industry players across all scales. This crisis has not only affected small businesses but has also toppled major industry giants previously considered "too big to fail." One of the most evident examples of this structural crisis is the bankruptcy of PT Sri Rejeki Isman Tbk (Sritex), the largest textile manufacturer in Southeast Asia. In October 2024, Sritex was declared bankrupt by the Semarang Commercial Court with total outstanding obligations reaching IDR 25 trillion.

As a result of this process, thousands of employees were affected by mass layoffs. The bankruptcy of Sritex raises important questions regarding the effectiveness of the company's financial management and the ability of stakeholders to detect early signs of financial distress. Considering Sritex's status as a publicly listed company that regularly publishes its financial statements, there should have been identifiable indicators enabling early detection of potential bankruptcy through an analysis of its historical financial performance (Susiana, 2025). The Sritex case serves as a stark warning for the national textile ecosystem; if a manufacturing giant with trillions in assets and decades of experience can collapse due to debt burdens and market pressure, small and medium-sized enterprises face an even greater bankruptcy risk.

This situation also reflects the growing vulnerability experienced by CV Arthatex, a small-scale textile retail company. The same industry pressures weakening consumer demand, shifting consumption patterns, and increasingly intense price competition have pushed the company into a severe performance decline. If Sritex, as a major upstream player, could not withstand the crisis, then

CV Arthatex with its simple capital structure and high dependence on retail sales is far more susceptible to financial distress. Thus, the Sritex case not only demonstrates the downfall of a large manufacturer but also mirrors the systemic nature of the textile industry crisis, which has further deteriorated CV Arthatex's financial condition throughout 2023–2024. Unlike Sritex, whose collapse occurred at the manufacturing level, CV Arthatex operates in the downstream sector (retail), making the impact of declining consumer demand more immediate and severe. Internal data show that the company experienced an extreme decline within a short period. In 2022, it was still able to generate profits; however, in 2023–2024, revenues dropped to zero, leading to a complete halt of its operational activities. Without an accurate early detection system, management often realizes too late that the company has entered a "distress zone," limiting the effectiveness of potential recovery strategies.

Furthermore, CV Arthatex possesses several characteristics that make it a unique and relevant case study. First, the company experienced an exceptionally sharp performance shift, moving from profitable operations in 2022 to total operational shutdown in 2024 an extreme phenomenon rarely documented among CV level textile retailers. Second, its capital structure is relatively simple and heavily reliant on short-term financing, making it highly vulnerable to liquidity shocks. Third, the company depends strongly on final consumer demand, leaving it more exposed when purchasing power weakens. These characteristics distinguish CV Arthatex from other textile retailers and justify its selection as a representative case study for illustrating downstream-sector vulnerability during the broader national textile crisis.

Despite the high bankruptcy risk within the textile industry, previous studies have primarily focused on publicly listed manufacturing firms on the Indonesia Stock Exchange. Research on bankruptcy prediction for small to medium-sized private textile retailers (CVs) remains very limited. Yet, CV scaled businesses have financial characteristics that differ significantly from public firms, including simpler reporting structures, limited access to capital, and higher exposure to operational risks. Therefore, this study seeks to bridge this gap by applying the Modified Altman Z-Score method, specifically designed for non-public firms to evaluate the financial condition of CV Arthatex. The relevance of using the Z-Score model in the context of Indonesian companies is also supported by research from Iskandar et al. (2022), which successfully employed this method to map financial distress conditions and identify declines in corporate financial performance.

Beyond this gap, very few studies have examined extreme short-term financial collapses like those experienced by CV Arthatex. This raises an important research gap concerning how early warning systems such as the Modified Altman Z-Score perform when applied to small, non-public textile companies exposed to severe industry shocks, including the cascading effects of major upstream failures such as the bankruptcy of Sritex. Hence, this study provides a significant academic contribution by analyzing financial distress within a CV-scale textile retailer during a period of national industrial crisis.

This study focuses on analyzing financial distress at CV Arthatex for the 2022–2024 period using the Modified Altman Z-Score method. The aim of this study is to classify the level of financial distress and assess the potential bankruptcy risk faced by CV Arthatex during this period. This research is not merely to report the company's financial condition but to evaluate its bankruptcy potential amid the ongoing crisis in the national textile industry. By employing the Modified Altman Z-Score, this study provides an early warning system that can support managerial decision-making related to financial restructuring and risk mitigation. The findings are expected to serve as a strategic foundation for CV Arthatex to undertake corrective actions promptly and avoid experiencing the same fate of liquidation that has affected other textile firms in Indonesia.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Literature Review and Hypothesis Development

This research is grounded in signaling theory, first developed by Michael Spence in 1973. According to Islamy et al. (2021) this theory involves a signal sender and a signal receiver. The sender, typically the company's internal management, provides relevant information about the company's condition, while the receiver is an external party. Information from the sender is received by the

receiver, who then forms an understanding and makes corresponding decisions. Financial information published by a company can contain positive signals (good news) or negative signals (bad news) regarding its performance and prospects.

The relevance of signaling theory to this research is that the Z-Score value, derived from the analysis of CV Arthatex's financial statements using the Altman Z-Score method, functions as a financial signal. A high Z-Score (safe zone) acts as a positive signal, indicating strong fundamentals and low bankruptcy risk. Conversely, a low Z-Score (distress zone) constitutes a negative signal, informing of a financial crisis and a serious threat to business continuity. This signal serves as a critical reference for management, investors, and creditors in evaluating the company's condition and taking necessary actions.

a) Financial Statements

Financial statements represent the final output of the process of recording and summarizing business transactions within an entity. According to PSAK No. 1, financial statements are a structured presentation of an entity's financial position and financial performance. This aligns with the view of Fitri (2023), who states that financial statements serve as a reporting format for the financial information of all accounts within a company for a specific accounting period and can be used to demonstrate the company's operational capabilities. The objective of financial statements, as per PSAK No. 1, is to provide information regarding the financial position, performance, and changes in the financial position of a company that is useful to a wide range of users in their decision-making processes.

Through the analysis of financial statements, it can be determined whether a company is exhibiting healthy performance or the opposite. According to Ardyansyah et al. (2022), financial statement analysis consists of the examination or study of relationships and tendencies (trends) to determine the financial position, operational results, and progress of the respective company.

b) Financial Ratios

Financial ratios are analytical tools utilized to assess a company's performance by comparing numerical values from various line items within its financial statements. Nurdiwaty and Zaman (2021) argue that the analysis of a company's financial ratios can systematically provide information regarding its financial condition and offer an evaluative process aimed at assessing the company's past and present financial position and operating results. According to Al Annuri and Ruzikna (2017), Altman focused on four categories representing three primary types of financial ratios: liquidity, profitability, and leverage/solvency. These categories are as follows:

1) Working Capital to Total Assets: This ratio measures a company's liquidity by comparing its working capital to its total assets.
2) Retained Earnings to Total Assets: This ratio measures the cumulative profitability of a company by comparing its retained earnings to its total assets.
3) Earnings Before Interest and Taxes to Total Assets: This is a profitability ratio that measures a company's ability to generate profit from its assets before the deduction of interest and taxes.
4) Book Value of Equity to Book Value of Liabilities: This is a solvency ratio used to measure the capacity of a company's equity to cover its long-term obligations.

c) Bankruptcy

Bankruptcy represents a company's failure to carry out its operational activities effectively in generating profits. Kinanti et al. (2023) state that bankruptcy is a condition in which a company or an individual is unable to pay its debts or generate sufficient profits to sustain its business operations. Bankruptcy is considered the final stage of an unhealthy financial condition, resulting from the management's inability to resolve the financial difficulties experienced by the company.

One of the primary causes of bankruptcy is poor business management, or mismanagement, within the firm. Bankruptcy can be triggered by both internal and external corporate factors. From a financial perspective, three conditions are commonly identified as leading to bankruptcy: (1)

insufficient or inadequate capital; (2) an excessive burden of debt and interest; and (3) persistent financial losses. These three factors are interrelated; therefore, firms must maintain an optimal balance by enhancing profitability, sustaining liquidity, and managing debt levels within their capital structure to mitigate the risk of bankruptcy.

d) Financial Distress

Definition of Financial Distress

Financial distress refers to a condition in which a company faces significant financial instability or is under severe financial pressure. This condition does not yet indicate bankruptcy but rather represents an early stage that reveals symptoms leading toward potential bankruptcy or liquidation. According to Ratna and Marwati (2018), financial distress occurs when a company experiences a consistent decline in its financial performance over time.

Benefits of Financial Distress Prediction

The analysis of financial distress provides substantial benefits for stakeholders as an early warning system, enabling them to identify warning signs and take preventive actions before a crisis escalates. The usefulness of information regarding a company's financial distress includes the following:

1) It enables management to take early preventive actions to mitigate potential problems before bankruptcy occurs.
2) Management can take corrective measures or restructuring actions to enhance the company's ability to meet its financial obligations and improve overall operational performance.
3) It provides an early warning signal of potential bankruptcy that may occur in the future.

e) Altman Z-Score Method

The analysis of financial distress and bankruptcy potential can be identified using the Altman Z-Score method, first proposed by Edward I. Altman in 1969. This method employs Multiple Discriminant Analysis (MDA), aimed at establishing a clear demarcation between companies with a high potential for bankruptcy and those without. As Altman's research subjects comprised different types of companies, he developed several distinct formulas applicable to various firms under different circumstances.

The first Altman Z-Score model, introduced in 1968, was developed from research on publicly traded manufacturing companies in the United States. Consequently, this model is most suitably applied to assess the financial stability of public manufacturing firms. The formula is as follows:

$$Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 0.999 X5$$

Several years later, in 1983, Altman conducted further research, this time focusing on private manufacturing companies. Therefore, this version is more appropriately used for manufacturing firms whose shares are not traded on a stock exchange (Wahyuni & Rubiyah, 2021). The formula is as follows:

$$Z = 0.717 X1 + 0.847 X2 + 3.108 X3 + 0.42 X4 + 0.988 X5$$

Altman (1995) formulated the Modified Z-Score Model, simplifying the previous version by eliminating X_5 (Sales/Total Assets), as this ratio was found to vary significantly among companies of different asset sizes. This modification renders the model highly flexible for application across various business sectors, both public and private, making it particularly suitable for use in developing countries such as Indonesia (Wahyuni & Rubiyah, 2021). The formula is as follows:

$$Z = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4$$

The classification of a company's financial health based on the Modified Altman Z-Score Model is determined as follows:
1) If the Z-Score < 1.1, the company is in the distress zone (high risk of bankruptcy).
2) If the Z-Score 1,1< Z< 2,6, the company is in the grey zone (moderate financial risk).
3) If the Z-Score > 2.6, the company is in the safe zone (low risk of bankruptcy).

METHODS

This study employed a quantitative descriptive method, which aims to describe or explain a phenomenon based on numerical data analyzed statistically. According to Sulistyawati et al. (2022), quantitative descriptive research is a type of study that describes, examines, and explains a phenomenon using numerical data as it is, without the intention of testing a specific hypothesis. This method is typically used to provide a comprehensive overview of a company's financial condition through the analysis of financial ratios using the Altman Z-Score model (Simamora & Putri, 2024). In this study, the quantitative descriptive approach was applied to analyze the financial condition of CV Arthatex during the period 2022–2024 using the company's available financial statements. The primary focus of this research is to identify the financial health of CV Arthatex and determine whether the company is experiencing financial distress that may lead to bankruptcy.

The object of this study is CV Arthatex, a trading company engaged in the textile sales sector. The research focuses on analyzing the level of financial distress and potential bankruptcy during the 2022–2024 period, using financial data derived from the balance sheet and income statement, which were analyzed using the Modified Altman Z-Score method. The selection of CV Arthatex as the research object was based on the company's declining revenue and continuous losses in recent years, making it a relevant subject for analysis due to its potential exposure to financial difficulties.

This study utilizes secondary data sources, obtained from various references and supporting materials such as books, journals, and previous studies relevant to this research. The data were collected from the internship site who assisted in the preparation of CV Arthatex's financial statements. The data consist of compiled financial reports, including the statement of financial position (balance sheet) and the income statement of CV Arthatex for the years 2022 to 2024.

Data Collection Technique

The data collection technique applied in this study is the documentation method. According to Hermawan (2019), the documentation method is a data collection technique conducted by reviewing various written documents such as reports, records, archives, or statistical data that provide information relevant to the research topic. In this study, the data consist of the financial statements of CV Arthatex for the period 2022–2024, obtained from archives and materials provided by the parties assisting in the preparation of the company's financial statements. The collected data include the balance sheet and the income statement, as these documents contain essential financial components required for the calculation of the Altman Z-Score model.

Data Analysis Technique

The data analysis technique used in this study employs the Modified Altman Z-Score method to analyze the financial health condition of CV Arthatex, as this method is highly flexible and can be applied to all types of companies, both public and non-public. Therefore, the Modified Altman Z-Score formula is considered highly suitable for application in developing countries such as Indonesia, as well as for the purposes of this study. The steps taken to determine the level of financial distress of CV Arthatex for the period 2022–2024 are as follows:

1. Calculating financial ratios included in the Altman Z-Score method, consisting of:

   a) $X1 = $ Working Capital / Total Assets

   b) X_2 = Retained Earnings / Total Assets

   c) X_3 = Earnings Before Interest and Taxes (EBIT) / Total Assets

   d) X_4 = Book Value of Equity / Book Value of Total Liabilities

2. Substituting the calculated ratios into the Modified Altman Z-Score formula as follows:

$$Z = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4$$

3. Analyzing and interpreting the calculated Z-Score results to determine the financial health classification of CV Arthatex, based on the Modified Altman Z-Score categories as follows:

   a) Z > 2.6 → categorized as a company in the safe zone, indicating a healthy financial condition and no signs of financial distress, meaning the company is not at risk of bankruptcy.

   b) 1.1 < Z < 2.6 → categorized as a company in the grey zone, indicating a moderate level of financial health with potential financial difficulties.

   c) Z < 1.1 → categorized as a company experiencing financial distress and facing a high risk of bankruptcy.

RESULTS AND DISCUSSION

To observe the financial development of CV Arthatex from 2022 to 2024, it can be seen in Table 1 below.

Table 1. Financial Development of CV Arthatex

Account Title Description	2022 (Rp)	2023 (Rp)	2024 (Rp)
Working Capital	747.824.991	32.151.703	9.635.903
Total Assets	1.696.321.064	54.316.532	21.423.403
Retained Earnings	362.141.651	0	-429.856.852
Earnings Before Interest and Taxes	-34.933.977	-429.856.852	-29.785.541
Book Value of Liabilities	919.860.890	453.557.588	450.450.000
Book Value of Equity	776.460.174	-399.241.056	-429.026.597

The formula used in calculating the level of financial distress in this study is the Modified Altman Z-Score model. The Modified Altman Z-Score formula is presented as follows:

$$Z = 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4$$

Based on the above formula, the Z-Score values of CV Arthatex for the period 2022 to 2024 were obtained and are presented in Table 2 below.

Table 2. Altman *Z-Score* Calculation

Ratio	Information	2022	2023	2024
X1	Working Capital/ Total Assets	0.44	0.59	0.45
X3	Retained Earnings/ Total Assets	0.21	0	-20.06
X3	Earnings Before Interest and Taxes/ Total Assets	-0.02	-7.91	-1.39
X4	Book Value of Equity/ Book Value Liabilities	0.84	-0.88	-1.39
Z-Score		**4.34**	**-50.22**	**-72.80**

Classification of Financial Distress Level of CV Arthatex for the Period 2022–2024 Based on the Altman Z-Score Method

The calculation results indicate a drastic shift in the company's financial condition, moving from a healthy position to a state of severe financial crisis. In 2022, CV Arthatex was in a very healthy

financial condition with a Z-Score of 4.34. This value exceeds the threshold of 2.6, classifying the company in the safe zone, which indicates a low risk of bankruptcy. This condition was supported by strong financial ratios, including adequate liquidity (X_1) and solvency (X_4), as well as the company's ability to retain a substantial portion of its earnings (X_2). These indicators convey a positive financial signal (good news) regarding the company's financial stability.

However, this condition changed dramatically in 2023, when the Z-Score dropped sharply to –50.22. This value is far below the critical threshold of 1.1, placing the company in the distress zone with a very high risk of bankruptcy. This extreme decline was primarily driven by massive operating losses ($X_3 = -7.91$), which completely eroded the company's retained earnings (X_2) and resulted in a capital deficit ($X_4 = -0.88$). This negative financial signal (bad news) indicates that the company was facing a severe financial crisis.

The downward trend continued and worsened further in 2024, with the Z-Score plunging even deeper to –72.80. The company remained in the distress zone, experiencing a heightened level of financial severity. All financial ratio components showed further deterioration, particularly the increasing deficit in retained earnings (X_2), confirming that CV Arthatex was in a critical financial condition threatening its business continuity.

Bankruptcy Potential of CV Arthatex for the Period 2022–2024 Based on the Altman *Z-Score* Method

Table 3. Bankruptcy Potential of CV Arthatex

Year	6.56	3.26	6.72	1.05	*Z-Score*	Classification
	X1	X2	X3	X4		
2022	2.89	0.70	-0.14	0.89	4.34	Safe Zone
2023	3.88	0.00	-53.18	-0.92	-50.22	Distress Zone
2024	2.95	-65.41	-9.34	-1.00	-72.80	Distress Zone

The results presented in Table 3 reveal a significant deterioration in the financial condition of CV Arthatex, indicating a high potential for bankruptcy during 2023 and 2024. The Z-Score value of 4.34 in 2022 placed the company in the safe zone, suggesting no short-term bankruptcy risk. However, the sharp decline in the Z-Score to –50.22 in 2023 and –72.80 in 2024 firmly classified the company within the distress zone, signifying that CV Arthatex faced a high probability of bankruptcy. Therefore, it can be concluded that throughout the research period (2022–2024), the company experienced sustained financial losses and a high potential for bankruptcy during 2023–2024.

This sharp decline serves as a strong early warning signal for management and stakeholders, highlighting a serious threat to the company's going concern. These findings align with Signaling Theory, wherein financial information represented by the Z-Score functions as a communication mechanism that reflects the company's fundamentals and prospects. The shift from the safe zone to the distress zone represents a negative financial signal (bad news), indicating a severe decline in performance and a prolonged financial crisis.

The consistency of these findings with previous research by Iskandar et al. (2022) which also confirmed the effectiveness of the Altman Z-Score model in detecting deteriorating financial performance further reinforces the argument that the model serves as an effective and reliable predictive tool. The negative signals identified in this study provide critical insights for management, shareholders, and creditors in assessing financial risks and formulating responsive strategies to mitigate the ongoing crisis.

CONCLUSION

Based on the research findings and the financial distress analysis using the Modified Altman Z-Score method on CV Arthatex for the period 2022–2024, several conclusions can be drawn as follows:

1) In 2022, CV Arthatex was in a healthy and stable financial condition, with a Z-Score value of 4.34, classifying the company within the "Safe Zone" since the score exceeded the threshold of 2.6. However, in 2023 and 2024, the company's financial position deteriorated sharply, with Z-Score values of –50.22 and –72.80, respectively. These results placed the company firmly within the "Distress Zone", as the scores fell well below 1.1, even turning negative. This clearly indicates that CV Arthatex experienced a persistent downward trend in financial performance.

2) The extremely low Z-Score values in 2023 and 2024 reflect a high potential for bankruptcy, primarily driven by declines in working capital, total assets, retained earnings, earnings before interest and taxes (EBIT), and equity, coupled with a significant increase in liabilities. These results represent a negative financial signal (bad news), providing critical insights for internal management to evaluate the company's deteriorating condition and for external stakeholders to take immediate corrective measures in response to the Z-Score analysis.

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