At-Tijaroh: Jurnal Ilmu Manajemen dan Bisnis Islam
Volume 11 (2), 2025: 252 - 266
P-ISSN: 2356-492X; E-ISSN: 2549-9270

BANKRUPTCY ANALYSIS OF PT SRI REJEKI ISMAN TBK (USING THE SPRINGATE, ZMIJEWSKI, AND GROVER METHOD)

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Abstract

The insolvency of Sritex has emerged as a significant issue, evident from the progressive decline in financial performance over recent years. Governments, investors, and scholars require early detection tools to recognize such risks in the future. This research aims to examine the bankruptcy status of PT Sri Rejeki Isman Tbk (Sritex), which was officially declared bankrupt in 2024, having previously been recognized as one of Indonesia's leading textile companies. This study employs a quantitative methodology and utilizes financial ratio analysis through three prediction models: Springate, Zmijewski, and Grover. The data used are secondary data obtained from Sritex's annual financial statements for the period 2017–2023. All three models indicate that Sritex experienced financial difficulties prior to its formal bankruptcy declaration. The Zmijewski model was the first to detect a decline in financial condition, followed by the Springate and Grover models. This research demonstrates that bankruptcy prediction models are valuable tools for the early identification of insolvency in publicly traded enterprises.

Keywords: Bankruptcy, PT Sri Rejeki Isman Tbk, Springate, Zmijewski, Grover, Financial Report

Received: Oct 01nd, 2025; Revised: Dec 29th, 2025; Accepted: Dec 29nd, 2025
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INTRODUCTION

Companies within the manufacturing sector are also confronting substantial financial challenges, including PT. Sri Rejeki Isman Tbk (Sritex), one of the largest integrated textile firms in Southeast Asia. Established in 1966, Sritex specializes in the production of yarn, raw fabric, finished fabric, and apparel. In recent years, the company has faced severe financial difficulties, attributable to high debt levels, inadequate cash flow, and asset impairments, inresulting to significant capital deficiencies. This predicament has been aggravated by the company's failure to fulfill its debt obligations, culminating in a bankruptcy petition filed by creditors and the Semarang Commercial Court's declaration of bankruptcy on October 23, 2024 (Rosaline, 2025).

The textile industry is a vital sector within Indonesia's manufacturing sector, owing to its significant contributions to employment and the national export revenue. Nonetheless, prominent textile corporations face substantial financial challenges due to volatile raw material prices, international competition, and economic uncertainties following the pandemic. Consequently, it is essential for corporate management, investors, and regulatory authorities to possess dependable tools for forecasting potential insolvency, thereby enabling the implementation of preventive measures at an early stage. Although numerous studies have employed classical models such as the Altman Z-Score, the Springate Model, the Zmijewski Model, and the Grover Model to analyze Indonesian enterprises, most of these investigations have used data from the pre-pandemic era or focused on sectors other than textiles.

According to a Kompas daily report on May 23, 2025, the Attorney General's Office of the Republic of Indonesia has investigated several parties, including Sritex's President Director, Iwan Kurniawan Lukminto. This investigation was conducted to investigate alleged misuse of credit funds. The credit, intended for business operations, was allegedly diverted by the financial institution for purposes inconsistent with the loan application (Octavia & Darmajati, 2025). This phenomenon is crucial for further analysis. While the company faces financial pressure, resulting in creditor defaults and thousands of employees being laid off, there are also indications of misuse of funds that could have been used to support its financial performance. Therefore, it is crucial to assess the company's financial health to determine the extent of its potential for bankruptcy, as evidenced by its financial ratios, before it actually experiences financial distress.

According to a CNBC Indonesia report written by Dwi (2024) on October 28, 2024, Sritex recorded total liabilities of US$1.6 billion, or approximately Rp25 trillion. This situation prompted the company to file for a Suspension of Debt Payment Obligations (PKPU), and was ultimately declared bankrupt in October 2024 by the Commercial Court at the Semarang District Court.

According to its financial statements, Sritex has consistently suffered losses in recent years. Its employee base has also steadily decreased since the onset of the COVID-19 pandemic.

The data source above shows that in 2017, the textile issuer (stock code SRIL) had approximately 16,000 employees. Then, in 2018-2019, its workforce increased to approximately 18,000. However, starting in 2020, the number of employees continued to decline, reaching approximately 11,000 by June 2024. This bankruptcy not only affected the company's internal financial structure but also created social problems, including mass layoffs of over 10,000 employees.

This phenomenon is crucial for further analysis. On the one hand, the company faced financial pressure, failed to pay its creditors, and laid off thousands of employees. On the other hand, there were indications of misuse of funds that should have been used to support its financial performance. Therefore, it is crucial to assess the company's financial health to determine the extent of its potential for bankruptcy, as evidenced by its financial ratios, before it actually experiences financial distress.

According to the state, early signs of potential bankruptcy can be identified using predictive models that serve as early warning systems. These models help identify and improve a company's financial condition before it reaches the point of total bankruptcy. Various models are commonly used to predict bankruptcy, such as the Springate, Zmijewski, and Grover models. Additionally, other models, such as Ohlson, Altman, Fulmer, and CA-Score, are also used in similar analyses.

The Zmijewski model, developed in 1984 using the probit regression method, employs three main ratios and has been deemed quite accurate by several previous studies, including those by M. Noor Salim & Ismudjoko (2021); Singh & Mishra (2016); Reza et al., (2023) and Husein & Pambekti (2015). However, several other studies, such as those by Purwanti et al., (2024) G. Singh & Mahajan (2024), found similar results in the banking sector, where accuracy is low, and it can only predict distress, not complete bankruptcy.

Meanwhile, the simpler Springate model uses four financial ratios and has been deemed quite accurate in various studies. For example, research by Prasetianingtias & Kusumowati (2019) and Natania & Suhartono (2024). However, weaknesses have also been identified, such as research by Utama & Hamidah (2024) Simatupang et al., (2024), which found that the Springate model had the lowest accuracy rate compared to several other models in predicting bankruptcy.

Another frequently used model is the Grover model, which demonstrates high accuracy in predicting bankruptcy. This is evidenced by research by Kembi et al., (2024) (2025). However, several other studies, such as those by Fadia & Simon (2024) and Aini et al., (2020), found that the Grover model has a relatively low accuracy rate compared to several other models.

Recent research shows that the accuracy of bankruptcy prediction models can vary across methods depending on industry characteristics and the analysis period. For example, a study of companies in the consumer-cyclical subsector using the 2020–2021 period using all four models showed that all models were able to predict distressed companies and provide early warning (Artini & Astika, 2024). Similarly, a recent study of retail companies listed on the Indonesia Stock Exchange for the 2020–2022 period, comparing Springate, Zmijewski, and Altman, found significant differences in predictive performance across models (Regita et al., 2024). Another study in the real estate/property sector for the 2020–2022 period also used a combination of Springate, Zmijewski, and Grover models to detect financial distress (Pangestu & Hati, 2024) .This confirms that the accuracy of classical models cannot be considered universal industry context, macroeconomic conditions, and the analysis period significantly influence prediction results.

However, specific literature focusing on large textile companies in Indonesia, using the most recent data and more than one bankruptcy prediction model, remains very limited. Most bankruptcy research focuses on other industrial sectors or subsectors, including consumer, property, and retail. Therefore, there is significant scope for research to make both empirical and practical contributions: analyzing the financial health of large textile companies using several bankruptcy prediction models, and comparing the results with recent data (including the post-pandemic period).

This study fills this gap by simultaneously applying three bankruptcy prediction models Springate, Zmijewski, and Grover to a large textile company (case study: PT Sri Rejekki Isman Tbk). This approach allows evaluation of each method's reliability within the national textile industry and helps determine the most appropriate method for detecting potential bankruptcy in this sector. Thus, this study makes a new and significant contribution to the literature on risk management and bankruptcy prediction in Indonesia: not only by updating the analysis period but also by expanding the scope of the research sector and providing empirical comparisons between models for the large textile industry.

The research findings are expected to be of practical relevance to company managers, investors, and regulators as an early warning tool and basis for decision-making, while also enriching the academic literature on bankruptcy prediction in the Indonesian textile manufacturing sector.

METHODS

The research method used in this study is a descriptive, quantitative approach, as it aims to analyze and explain the financial health of PT Sri Rejeki Isman Tbk using a bankruptcy prediction model. The administrative location of the study is the Indonesia Stock Exchange (IDX) as a secondary

data source, as well as other relevant sources such as the company's official financial reports and the Indonesia Stock Exchange (IDX) website. The object of this study is the annual financial report of PT Sri Rejeki Isman Tbk for the period 2017 to 2023. The data analyzed are from the company's annual financial reports for the period 2017 to 2023. The data source for this study is the annual financial report of PT Sri Rejeki Isman Tbk, a textile and garment manufacturing company listed on the Indonesia Stock Exchange (IDX). The 2017–2023 period was deliberately chosen to encompass the pre-, during-, and post-COVID-19 pandemic phases, so the corporate bankruptcy analysis accounts for significant external dynamics and macroeconomic shocks, as well as the recovery period. This study thus explains whether the pandemic and domestic global economic pressures impacted corporate financial health and assesses resilience/changes in bankruptcy risk over time. Much recent literature indicates that the pandemic period (2020–2021) brought dramatic changes to corporate performance in Indonesia, so the inclusion of pre-pandemic (2017–2019) and post-pandemic (2022–2023) data makes the results more comprehensive and contextual (Maharani et al., 2025).

Data collection methods or techniques can be carried out through interviews, questionnaires, observations, documentation, and a combination of the four (Sugiyono, 2023:194).. The financial report data used covers the period 2017 to 2023 and was obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official company website (www.sritex.co.id). This study used three bankruptcy prediction analysis models: Springate, Zmijewski, and Grover. The secondary data used is sourced from official company financial reports namely annual reports and audited financial statements accessed through official stock exchange or company websites, as well as official publications. The use of audited data provides both internal and external validity: internal validity because auditors have reviewed the financial figures; external validity because they are publicly verifiable and comply with reporting standards. This approach is consistent with practice in recent bankruptcy prediction research in Indonesia.

Financial data, calculate the financial ratios required by each model (working capital, total assets, total liabilities, current assets, current liabilities, net profit, EBIT, etc.). For each model (Springate, Zmijewski, Grover), calculate the "S-Score," "X-Score," or "G-Score" using standard formulas. Here's the general scheme, as described previously, and the interpretation of the scores:

Table 1. Analysis Model and Formula

Model Formula	Limit Formula	Classification (Cut-off) / Interpretation
Springate S-Score	S = 1.03 (A) + 3.07 (B) + 0.66 (C) + 0.4 (D) (Rayyani & Wahyudi, 2024)	– S > 1.062 → healthy / safe – S ≤ 0.862 → indication of danger of bankruptcy (Rayyani & Wahyudi, 2024)
Zmijewski X-Score	X = –4.3 – 4.5*(Net Profit / Total Assets) + 5.7*(Total Liabilities / Total Assets) + 0.004*(Current Assets / Current Liabilities)	Nilai X > 0 → Companies at risk of bankruptcy/financial distress; X ≤ 0 → relatively safe (note: interpretation may vary based on model/study adaptation). Recent Indonesian literature uses this cut-off.(Regita et al., 2024)
Grover G-Score	G = financial ratios according to the Grover model (similar to the Springate / Z-score concept, based on profitability, liquidity, solvency, and activity). (Hadityo & Indrawati, 2024)	Interpretasi: Companies with a G-Score below the threshold (according to research parameters) are categorized as having the potential for bankruptcy. In many Indonesian studies, the G-Score predicts potential bankruptcy, especially in companies affected by the pandemic/crisis.. (Rayyani & Wahyudi, 2024)

RESULT AND DISCUSSION

Bankruptcy Ratio Analysis

Model Springate

This model was developed by Springate in 1978 using Multiple Discriminant Analysis (MDA). In the MDA method, more than one financial ratio related to corporate bankruptcy is required to form a better model (Aadilah & Hadi, 2022). The equation of the Springate model (S-Score) is as follows:

$$\textbf{S-}\textit{Score} = 1{,}03X1 + 3{,}07X2 + 0{,}66X3 + 0{,}4X4$$

With the following explanations:

X1 = Working Capital / Total Assets (WCTA)

X2 = Earning Before Interest and Taxes / Total Assets (EBITTA)

X3 = Earning Before Taxes / Current Liabilities (EBTCL)

X4 = Sales / Total Assets (SATA)

The Springate model has a cut-off value of S > 0.862 for a company in non-financial distress (healthy), and if S < 0.862 for a company in financial distress (bankrupt). The following are the results of the Springate model calculations from 2017-2023:

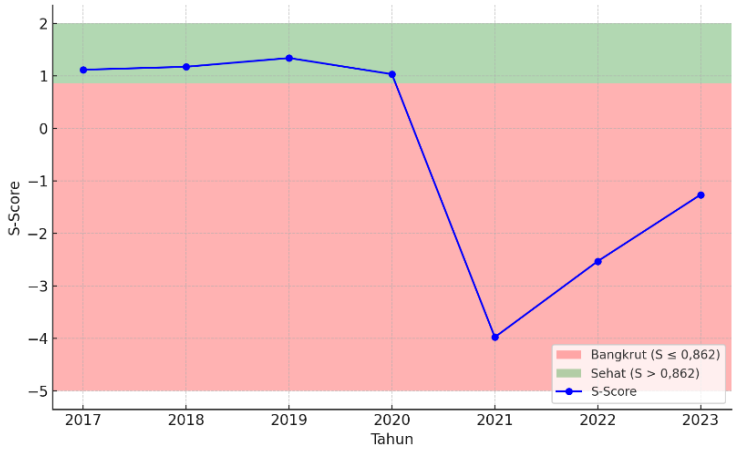

Figure 1. Sritex S-Score Graph 2017-2023

Based on the Springate model calculations, Sritex's score in 2017–2020 was above the healthy threshold (0.862), indicating a stable financial condition. However, in 2021, it experienced a sharp decline to -3.977 due to negative working capital, significant operational losses, and high short-term liabilities. Overall, Springate's score increase in 2022–2023 does not indicate a complete recovery but rather a temporary improvement driven by financial restructuring and loss reduction. The S-Score remains below the healthy threshold (0.862), so Sritex remains categorized as bankrupt. The primary drivers of this score change are likely net losses, declining revenue, and liquidity and working capital pressures, particularly since the onset of the COVID-19 pandemic, which has impacted the global textile industry.

This extreme decline is not simply a change in numbers; it reflects a crisis point when working capital becomes negative, short-term liabilities explode, and operating profits turn into substantial losses due to the ever-increasing debt burden. This means that the shift from "healthy" to "distressed" reflects a significant change in the risk structure in a short period of time.

Model Zmijewski

The Zmijewski model (X-Score) is one of the most widely used approaches for identifying a company's financial distress. Developed by Mark Zmijewski in 1983, this model is based on longitudinal research spanning two decades. This approach uses financial ratio analysis covering three main dimensions: profitability**,** leverage**,** and liquidity to predict the likelihood of bankruptcy of a business (Abadi & Misidawati, 2023:40).

The Zmijewski model calculates 3 financial ratio variables and includes the classification of the calculation results into the predetermined Cut Off value. If the calculation results of the Zmijewski model have a cut-off value <0, then the company has a non-financial distress condition (Healthy)

and a cut-off value >0, then the company has a financial distress condition (Bankrupt), which is calculated using the following equation.:

$$\textbf{X-}\textit{Score} = -4{,}3 - 4{,}5X1 + 5{,}7X2 + 0{,}004X3$$

With the following explanations:

X_1 = Return on Assets (ROA)

X_2 = Debt Ratio (Leverage)

X_3 = Current Ratio (Liquidity)

From the equation above, X1 equals ROA, X2 is leverage, and X3 is liquidity for each sample year in this study. The following are the results of the Zmijewski model calculations from 2017 to 2023.

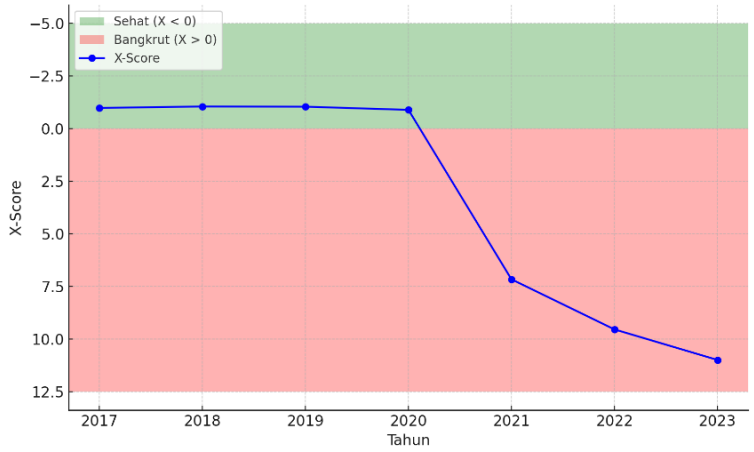

Figure 2. Sritex X-Score Graph 2017-2023

PT Sri Rejeki Isman Tbk was in a healthy financial condition (non-financial distress) from 2017 to 2020, with a negative score approaching zero. However, from 2021 to 2023, the Zmijewski score showed a high positive value, indicating that the company was in financial distress. The seven-year average overall score of 3.39, which falls into the financial distress category, reflects a significant downward trend in financial health. This indicates that, although the company was healthy at the beginning of the period, PT Sri Rejeki Isman Tbk is generally trending towards an unhealthy state in the long term, according to the Zmijewski model.

This occurs because the Zmijewski model places significant weight on leverage and profitability, particularly given Sritex's steadily increasing Debt Ratio, driven by debt-financed expansion. This high sensitivity is crucial for regulators and investors because it allows for the detection of distress risk before visible signs of collapse appear, as in 2021.

Model Grover

The Grover model (G-Score) is one of the bankruptcy prediction methods developed as an improvement of the Altman Z-Score model. Introduced by Jeffrey S. Grover in 2001, this model employs a linear discriminant analysis to identify a company's financial distress. Unlike Altman, who developed the model for public companies, Grover designed it for private and non-manufacturing companies, accounting for the limitations of market data (Abadi & Misidawati, 2023:42).

Grover model prediction calculation, in this formula 3 financial ratio variables are used to obtain results which are then classified into the specified cutoff value, if the calculation result (G-Score > 0.01) the company has a non-financial distress condition (Healthy) and (G-Score < -0.02) then the company has a financial distress condition (Bankrupt) which is calculated using the equation:

$$\textbf{G-}\textit{\textbf{Score}}\textbf{ = 1,650 X1 + 3,404 X2 + 0,016 X3 + 0,057}$$

With the following explanations:

X_1 = Working Capital / Total Assets

X_2 = Net Profit Before Interest and Tax / Total Assets

X3 = Net Income / Total Assets

In this formula, X1 is WCTA (Working Capital to Total Assets), X2 is EBITTA (Earnings Before Tax to Total Assets), and X3 is ROA (Return on Assets). The following are the results of the Grover model calculations from 2017 to 2023:

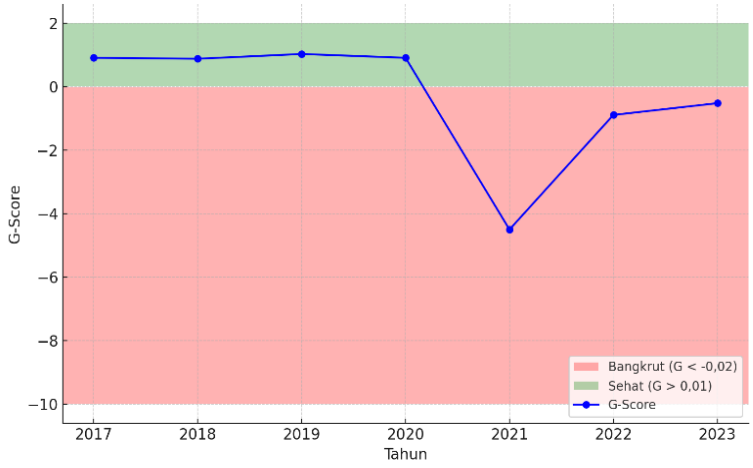

Figure 3. Sritex G-Score Graph 2017-2023

During the 2017–2020 period, Sritex's G-Score consistently remained above the healthy threshold (>0.01). This reflects stable financial condition, positive working capital, maintained profitability,

and a relatively good ability to pay obligations. The X1, X2, and X3 values during this period indicate healthy operational performance and adequate liquidity.

In 2022 and 2023, the G-Score improved to -0.89 and -0.52, respectively. This increase was due to debt restructuring, cost efficiencies, inventory control, and a slight improvement in debt repayment capacity. However, the score remains below the healthy threshold, so according to the Grover Model, PT Sri Rejeki Isman Tbk remains in the bankruptcy category. This improvement is not just a number, but reflects the concrete impact of debt restructuring, cost efficiencies, and improved inventory management, which have reduced short-term liquidity pressures. In other words, the company's financial rescue efforts are beginning to show results, although conditions have not fully recovered. The profitability ratio (CR) is slowly improving, and loss margins are narrowing, resulting in slightly improved capacity to service obligations. However, because the DER remains high, this recovery remains fragile.

Comparison between models

To obtain a more comprehensive picture of the potential bankruptcy of PT Sri Rejeki Isman Tbk, a comparison was conducted between three prediction models: Springate, Zmijewski, and Grover. The objectives of this comparison were:

a. To examine the consistency of prediction results across models,
b. To identify differences in the starting point for detecting financial distress, and
c. To assess which model is most sensitive and accurate in detecting the company's financial condition..

Table 2. Comparison of Bankruptcy Prediction Results

Tahun	Springate	Zmijewski	Grover	Hasil Mayoritas
2017	H	H	H	H (Healthy)
2018	H	H	H	H (Healthy)
2019	H	H	H	H (Healthy)
2020	H	H	H	H (Healthy)
2021	B	B	B	B (Distressed)
2022	B	B	B	B (Distressed)
2023	B	B	B	H (Healthy)
Rata-rata skor	-0.44 (B)	3.39 (B)	-0.31 (B)	—

Source: Processed Data, 2025

Overall, the three models show high predictive consistency, particularly in capturing drastic changes from healthy to distressed. Although the final results tend to be similar, there are differences in the timing of early detection of bankruptcy symptoms:

a. The Zmijewski model is the most sensitive and detects potential distress the earliest, in 2019. Although the score is still slightly below the threshold, this is an early indicator that a company's profitability and leverage are beginning to deteriorate.
b. The Springate model detects distress as early as 2021, along with a worsening working capital ratio and a sharp decline in pre-tax profit.
c. The Grover model also identifies financial distress in 2021. Still, Grover's negative scores tend to be less severe than those of the Springate model, suggesting that the Springate model has a medium sensitivity threshold.
d. The distress cycle suggests that companies with aggressive, debt-driven expansion tend to experience a crisis-delay effect, in which operating performance remains strong before financial burdens reach a critical point. A profitability-leverage-focused model like Zmijewski's will more quickly capture this risk than working capital-focused models like Springate's or Grover's.

Discussion of Bankruptcy Ratio

Financial performance of PT Sri Rejeki Isman Tbk 2017-2023

This indicates a significant shift from a stable condition to a sharp decline starting in 2020. Profitability ratios such as ROA, ROS, and NPM showed positive, stable values in the 2017–2019 period but experienced a drastic decline, even becoming negative, from 2020–2023. This indicates that the company experienced significant losses, especially as the COVID-19 pandemic began to affect the textile industry. In terms of solvency, the DER and DAR ratios indicated an extreme imbalance in capital structure in 2021, a strong signal that the company was struggling to meet its long-term obligations. The company's liquidity also declined significantly, as reflected in the Current Ratio and Quick Ratio, which fell sharply during the crisis years. Activity ratios also indicated a decline in asset utilization and operational efficiency.

Bankruptcy analysis using the Springate Model

The calculation results indicate that the company was financially healthy (non-financial distress) from 2017 to 2020, with the S-Score consistently above the 0.862 cut-off. However, from 2021 to 2023, the S-Score declined sharply to negative, indicating financial distress. The turning point occurred in 2021, when ratios such as EBIT and net profit, which are components of the model, experienced a significant, even negative, decline. The average S-Score of -0.44 during the 2017–

2023 period indicates that the company experienced an overall financial decline, placing it in an unhealthy condition.

Bankruptcy Analysis Using the Zmijewski Model

The analysis results show that from 2017 to 2020, the Zmijewski score was below 0 (negative), indicating that the company was financially healthy. However, from 2021 to 2023, the X-Score increased positively, reaching 10.99 in 2023, indicating severe financial distress. Interestingly, the Zmijewski model was the most sensitive in detecting signs of distress, with declining leverage and ROA since 2019, providing an early indication that the company's financial structure was becoming unstable. An average X-Score of 3.39 during the 2017–2023 period indicates that the company was generally insolvent.

Bankruptcy Analysis Using the Grover Model

The analysis results indicate that the company was financially healthy from 2017 to 2020, with a stable G-Score above the 0.01 cut-off. However, conditions changed drastically starting in 2021, with the G-Score turning negative and falling well below the healthy threshold. The G-Score reached -4.50 in 2021, reflecting a deep financial crisis. Grover's model corroborates other models' findings that the company's financial crisis began in 2021, consistent with the declines in EBIT, ROA, and working capital. The average G-Score of -0.31 over the 2017–2023 period indicates that the company is generally in an unhealthy condition and has a high risk of bankruptcy.

CONCLUSION

Based on the research and analysis of PT Sri Rejeki Isman Tbk's financial statements for 2017–2023, the following conclusions can be drawn is Corporate management and regulators (emphasizing early monitoring through specific models), policy recommendations/strategies for mitigating bankruptcy risk, and directions for further research (e.g., cross-industry comparisons and integration/validation with the Altman/Ohlson model). I have included reputable research references from the last five years to support each point. Internal citations are included after the relevant sentence. The analysis using the Springate, Zmijewski, and Grover models underscores the importance of implementing financial ratio-based early warning systems as part of continuous due diligence. Retail and institutional investors should incorporate monitoring of liquidity, leverage, and profitability indicators that are sensitive to rapid changes (e.g., seasonal cash shortfalls) to determine investment positions or exit strategies more quickly. For corporate management, these findings underscore the urgency of establishing internal monitoring systems, e.g.. These routine financial dashboards measure ratios used by bankruptcy models, so management can take proactive corrective actions (cost control, debt restructuring, working capital improvements) before

conditions worsen. Research on multi-stage early warning systems and machine learning suggests that combining traditional models with layered monitoring increases the sensitivity of early detection. For regulators and market supervisors, the implications are the need to promote transparency in financial reporting and strengthen disclosure requirements to enable external parties (investors, creditors) and authorities to conduct systemic monitoring. Regulators can also adopt sectoral early warning frameworks that utilize proven statistical models to identify high-risk companies for more targeted policy interventions. This study suggests several steps: (1) strengthening corporate governance as the first line of defense against distress e.g., independent board oversight and clear risk management; (2) expanding access to debt restructuring and short-term liquidity programs for strategic companies experiencing temporary shocks; (3) requiring and facilitating periodic audits/risk assessments for public companies that are more vulnerable to market volatility; and (4) encouraging the adoption of real-time financial information systems so that ratio measurements for predictive models can be conducted regularly. Empirical evidence suggests that corporate governance mechanisms and liquidity interventions can reduce the probability of financial distress, suggesting that policies that combine prudential supervision and scaled liquidity support can reduce systemic bankruptcy rates.

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