Jurnal Cendekia Keuangan, ISSN 2827-7643 (Print), ISSN 2810-0964 (Online)
Vol. 4, No. 1 (2025) 38-45

JURNAL CENDEKIA KEUANGAN
UNIVERSITAS ISLAM KADIRI

Journal homepage: https://ejournal.uniska-kediri.ac.id/index.php/JCK

Financial Distress Using the Zmijewski, Grover, and Springate Models at Retail Business in Indonesia

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ARTICLE INFO

Keywords:
Financial distress, Zmijewski, Grover, Springate.

JEL Classification: G33

Article History:
Received
2025-01-13
Revised
2025-03-03
Accepted
2025-04-01

DOI: 10.32503/jck.v4i1.6138

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ABSTRACT

Manuscript type: Research paper
Introduction/Main Objectives: This study aims to analyze PT Matahari Putra Prima's financial health during 2018-2022 using the Zmijewski, Grover, and Springate models to predict potential financial distress. **Background Problems:** When a company experiences bankruptcy, its financial statements must be evaluated and measured through in-depth research. PT Matahari Putra Prima Tbk, a major player in Indonesia's retail industry, has faced significant challenges over the past few years due to shifts in consumer behavior towards online shopping and the economic impacts of COVID-19. **Novelty:** This research fills the gap in financial distress in retail businesses in Indonesia. **Research Methods:** This study uses a descriptive quantitative approach. The financial data of PT Matahari Putra Prima Tbk from 2018 to 2022, obtained through documentation and literature review, were analyzed using three financial distress models: Zmijewski, Grover, and Springate. The sampling technique is a sampling technique to be used in research. The sampling design of this study uses nonprobability sampling. Nonprobability sampling can provide very useful information for a population. Following this study, the author will use the purposive sampling technique. **Finding/Results:** PT Matahari Putra Prima Tbk for five years for 2018 – 2022 using Zmijewski, Grover, and Springate indicated that the company was experiencing Financial Distress. **Research limitation/implications:** It is better for PT. Matahari Putra Prima Tbk evaluates financial performance to bring the company to a better state. The company's value that shows the risk of financial distress, PT Matahari Putra Prima Tbk, focuses more on improving operational efficiency and reducing costs in improving cash management and reducing short-term debt to reduce the risk of financial distress. Furthermore, maintain good communication with investors and stakeholders to build trust and support.

1. Introduction

Companies must adapt to rapid changes in today's global economy to maintain their competitive edge (Nozharov & Hristozov, 2023). However, businesses that fail to keep up may face financial difficulties, often called financial distress (S. Wang & Chi, 2024). Financial distress occurs when a company struggles to meet its debt obligations due to inadequate cash flow (Marsenne et al., 2024). One of the primary indicators of potential bankruptcy is the analysis of financial distress using prediction models.

Less adaptable companies may face difficulties and declines in their competitive style (Rahmi et al., 2024). In addition to these aspects, globalization also plays a role in technology transfer and industrial development innovation at the local level (Sun et al., 2024). As a result, small-scale companies risk facing financial difficulties in their operations (J. Wang et al., 2024). Companies in Indonesia must be able to compete to face all these conditions and circumstances because otherwise, unpreparedness and inability to compete will cause bad business activities (Rahim et al., 2024). If the company cannot survive, its financial condition will be unhealthy (financial distress). The worst thing is that it will experience bankruptcy.

When a company experiences bankruptcy, its financial statements must be evaluated and measured through in-depth research (Sayidah & Assagaf, 2020). For the information in financial statements to make a maximum contribution to supporting decision-making, it is necessary to convert financial data into substantial and relevant information in economic decision-making (Rizki et al., 2024). This transformation involves careful analysis to identify trends, patterns, and risk factors affecting a company's financial condition (Hajek & Munk, 2024). By converting financial data, stakeholders can better understand the company's financial condition and make more informed decisions.

PT Matahari Putra Prima Tbk, a major player in Indonesia's retail industry, has faced significant challenges over the past few years due to shifts in consumer behavior towards online shopping and the economic impacts of COVID-19. One of the developments in the current change in human lifestyle is the shift in trend from offline shopping to online shopping. PT Matahari Putra Prima Tbk is a large company engaged in the retail sector that runs a chain of convenience stores that provide various daily necessities. Some well-known stores under the MPPA include Hypermart, Foodmart, and Boston Health & Beauty. With the development of changes in human lifestyles, today, there is a shift in trends from offline shopping to online shopping. However, the company's finances are not fully prepared for these changes. PT Matahari Putra Prima Tbk is getting weaker due to the impact of online shopping. Having recovered from the impact of shopping trends, PT Matahari Putra Prima Tbk is facing new challenges due to COVID-19, which has caused significant losses in various fields. The following is a table of PT Matahari Putra Prima Tbk's profit in 2018-2022.

Table 1. Financial Reports MPPA in Billion Rupiah

Year	Net Sales	Loss for the Year
2022	7,017	(430)
2021	6,655	(338)
2020	6,747	(405)
2019	8,655	(553)
2018	10,692	(898)

Based on Table 1 of PT Matahari Putra Prima Tbk's financial performance in the last five years, it has not recorded a positive profit from 2018 to 2022. PT Matahari Putra Prima Tbk's finances from 2018 to 2022 show that the company experienced a significant decrease in revenue from IDR 10.7 trillion in 2018 to IDR 6.7 trillion in 2020. Although revenue increased slightly to IDR 7 trillion in 2022, the company continues to record a net loss yearly, from IDR 898 billion in 2018 to IDR 430 billion in 2022. This shows that despite efforts to increase revenue, the company still faces major challenges in achieving positive profitability. If it is known from the income statement, PT Matahari Putra Prima recorded a gross profit with a fairly stable margin in the range of

17%-19%. However, the total value is greater than the revenue when it is known from the cost of goods sold and operating expenses. This is what caused business profits before taxes to suffer losses since 2018.

The research of Indrawan & Gusmarani (2023) is based on the results of financial distress research that has been conducted on hotel companies that have been listed on the Indonesia Stock Exchange in 2021-2022 using the Z-Score, Zmijewski, Grover, and Springate models. The results show that the Zmijewski model has the best accuracy in predicting the company's financial distress. Meanwhile, research from Piscestalia & Priyadi (2019) by analyzing the comparison of the financial distress model of Springate, Ohlson, Zmijewski, and Grover in coal mining companies in 2012 – 2016, shows that the Springate model is the most accurate prediction model in predicting financial distress conditions in coal mining companies.

Wahyunigsih & Venusita (2022) research, which analyzed Altman, Sprimgate, Zmijewski, Fulmer, and Grover in retail companies listed on the Indonesia Stock Exchange during 2019-2020, showed that different prediction models will produce different results even though some prediction models declare bankruptcy. However, some can still maintain a balance in their financial performance. Prasetianingtias & Kusumowati (2019) conducted a comparative analysis of the Altman, Grover, Zmijewski, and Springate models. It shows that the Grover model is the most accurate prediction model and the most accurate in predicting financial distress on negative net income and dividend payments. Iswahyudi (2022) analyzes the Zmijewski, Taffler, Springate, and Grover models in state-owned companies experiencing financial difficulties. These three models show a mismatch when used to predict financial failure in the banking sector.

This study aims to analyze PT Matahari Putra Prima's financial health during 2018-2022 using the Zmijewski, Grover, and Springate models to predict potential financial distress.

1. Literature Review

1.1. Financial Distress

Financial distress analysis can help companies find the right solutions to overcome financial problems (Jannah & Kusumawardani, 2024). This is an early warning sign system for parties who have an interest in the company (Duri & Kusumawardhani, 2024). Through the financial statements published by the company, it will be possible to know what causes financial distress and what steps need to be taken to overcome these conditions (Putri & Maulana, 2023).

According to Hery (2016), financial distress is when a company has difficulty meeting its obligations, a situation in which its income cannot cover total costs and suffers losses. Irfani (2020) explained that financial distress or financial difficulties describe the condition of companies that fail to pay off their due debts and are accompanied by a reduction in the amount of dividends. One of the characteristics that causes potential financial difficulties is the company's operating cash flow, which tends to be negative.

2.2. Zmijewski Model

Zmijewski (1984) introduced analysis to predict financial distress using more complex calculations. A model that presents the cumulative function of normal distribution. Mark E. Zmijewski developed this model with the bankruptcy prediction model and stated that this model is accurate in predicting the financial condition of companies listed on the stock exchange with the following equation:

X-Score = -4.336 – 4.513 X1 + 5.679 X2 – 0.004 X3

X1 = Net income / total asset

X2 = Total debt / total asset

X3 = Current asset / current liabilities

Zmijewski's model uses probit analysis to integrate these three ratios and predict the potential for a company's bankruptcy. The analysis results are then categorized based on the X-score, with an $X < 0$ value indicating a healthy company and an $X > 0$ value indicating an unhealthy company potentially experiencing bankruptcy.

2.3. Grover Model

The Grover model was created by designing and re-evaluating the Z-score Altman model. In 1968, Jeffrey S. Grover in Prihantini & Sari (2013) produced the following equation:

G-Score = 1,650 X1 + 3,404 X2 – 0,016 ROA + 0,057

X1 = Working capital/ total asset

X2 = Earning before interest and taxes/total asset

ROA = Return on Assets

The Grover model categorizes that a company is in a state of financial distress with a score of less or equal to ($X < -0.02$), then it can be said that the company is in an unhealthy state. At the same time, the value for a company categorized as not bankrupt is more or equal to 0.01 ($X > 0.01$). If the company is within the limit and the lower limit, then the company is in the gray area.

2.4. Springate Model

According to Springate (1978) has researched a company's potential financial distress prediction model. The Springate model is developed using multidisciplinary analysis. At first, Springate used 19 financial ratios, but it took four ratios after conducting testing. This Springate model can predict bankruptcy with an accuracy value of 92.5%. According to Hery (2016) this model has the formula:

S-Score = 1.03 X1 + 3.07 X2 + 0.66 X3 + 0.4 X4

XI = Working Capital / Total Aset

Working Capital = Current Assets –

Current Liabilities.

X2 = EBIT / Total Aset

X3 = EBT / Current Liability

X4 = Sales / Total Aset

If the S value ≥ 0.862, the company is in the Safe Zone (Low-Risk Area, Healthy). Conversely, if the S value < 0.862, the company is in the Distressed Zone (High Risk of Bankruptcy).

3. Research Methodology

3.1. Research Design

This study uses a descriptive quantitative approach. The financial data of PT Matahari Putra Prima Tbk from 2018 to 2022, obtained through documentation and literature review, were analyzed using three financial distress models: Zmijewski, Grover, and Springate. The Zmijewski model utilizes three financial ratios: net income to total assets, total debt to total assets, and current assets to current liabilities. The Grover model incorporates working capital to total assets, earnings before interest and taxes (EBIT) to total assets, and return on assets (ROA). The Springate model uses four ratios: working capital to total assets, EBIT to total assets, earnings before taxes (EBT) to current liabilities, and sales to total assets. The analysis focuses on whether these models predict financial distress or stability for the company.

3.2. Population and Sample

The sampling technique is a sampling technique to be used in research. The sampling design of this study uses nonprobability sampling. Nonprobability sampling can provide very useful information for a population. Following this study, the author will use the purposive sampling technique. The sample in this study includes financial statements in the year of PT Matahari Putra Prima for five years from 2018 - 2022, focusing on financial data used to analyze the company's financial distress during that period.

4. Results and Discussion

4.1. Zmijewski Model

The company is declared healthy if the value obtained is negative (<) 0. However, if the value obtained is positive (>) 0, the company is declared to be experiencing financial distress. The following are the calculations using the Zmijewski model:

Table 2. Zmijewski Model Calculation

Year	X Score	Result
2018	0,87	Financial Distress
2019	1,25	Financial Distress
2020	1,56	Financial Distress
2021	1,00	Financial Distress
2022	1,65	Financial Distress

From Table 2, it can be seen from the lack of liquidity that companies may have difficulty managing their liquidity, where the current debt is more than the current assets, so the company cannot pay the debt or meet its obligations. The DAR value of PT Matahari Putra Prima Tbk has increased, where the DAR value is above 0.5, showing that most of the company's assets depend on debt. Another cause is the decline in ROA value, which shows that the company has failed to manage its assets. Thus, the analysis of the X-Score values for five years, with 2018 – 2022, at PT Matahari Putra Prima Tbk shows that the company is experiencing financial distress.

4.2. Grover Model

Grover formulated a method of predicting financial distress by subtracting some of the financial ratios used and changing the weighted coefficients of each ratio. The company is declared financially distressed if the value obtained is less than or equal to (≤) -0.02. The company is declared good health if the value obtained is higher or equal to (≥) 0.01. The company is in the gray area if the value obtained is more than -0.02 and less than 0.01.

Table 3. Grover Model Calculation

Year	G Score	Result
2018	-0,84	Financial distress
2019	-0,53	Financial distress
2020	-0,70	Financial distress
2021	-0,30	Financial distress
2022	-0,63	Financial distress

Table 3 shows that the company PT Matahari Putra Prima Tbk in 2018 and 2022, so the company experienced unhealthy conditions or financial distress. The indication of the cause of Grover's decline is based on the decline in the value of three ratios of working capital to total assets, EBIT to rolling assets, and ROA. The decline in the value of these three ratios indicates that the company is experiencing a decline in capacity, where it does not use its assets efficiently to generate profits, which can indicate financial weakness.

4.3. Springate Model

The Springate method uses four financial ratios to predict financial difficulties in companies. If the value obtained exceeds (>) 0.862, the company is declared good health. However, if the value obtained is less than (<) 0.862, the company is declared financially distressed. The model that Springate has produced is as follows:

Table 4. Perhitungan Model *Springate*

Year	S Score	Result
2018	-0,12	Financial Distress
2019	0,38	Financial Distress
2020	-0,05	Financial Distress
2021	0,19	Financial Distress
2022	0,09	Financial Distress

Based on Table 4 above, it is known that the results of the calculation of PT Matahari Prima Tbk's springate model for five years, the period 2018-2022. The company is considered unhealthy or financially distressed during 2018-2022 because the S-score result is less than 0.862. Due to the low WCTA ratio, where the value of the WCTA ratio indicates that the company's total assets are still focused on paying off short-term debt and not enough to increase its profit, the company may not have enough funds to meet its short-term obligations. This can cause the company serious difficulties, contributing to potential bankruptcy. The ratio of profit before tax to current debt (EBT/CL) is low, so the company may not manage current debt well. This can cause the company to lose money and face financial difficulties.

4.4. Comparison of Zmijewski, Grover, and Springate

Table 5. Comparison *of Zmijewski, Grover, and Springate*

Year	Zmijewski	Grover	Springate
2018	0,87	-0,84	-0,12
2019	1,25	-0,53	0,38
2020	1,56	-0,70	-0,05
2021	1,00	-0,30	0,19
2022	1,65	-0,63	0,09
Average	1,27	-0,60	0,09
Result	Financial Distress	Financial Distress	Financial Distress

The results of bankruptcy prediction after testing in this study at PT Matahari Putra Prima Tbk for five years, from 2018 to 2022, showed that the average value of the three models differed. Analysis of the results of comparing the three financial distress models (Zmijewski, Grover, and Springate) in the 2018-2022 data can be done with an annual analysis step, namely the change in value from one year to the next.

Zmijewski's model analysis on PT Matahari Putra Prima Tbk for five years, starting from 0.874 in 2018. This value increased to 1.659 in 2022. Zmijewski's average score during this period was 1,273. Zmijewski's increase in value indicates that the company is experiencing financial distress. Therefore, based on the Zmijewski model, the company is at risk of bankruptcy. The increase in DAR's value is due to a pre-financing project, where the payment scheme will be implemented after completion. The payment scheme encourages increased corporate debt as capital for operational activities and causes net profit to decline.

The analysis of the Grover model on PT Matahari Putra Prima Tbk during the 2018-2022 period shows consistent negative value results throughout the period, ranging from -0.846 in 2018 to -0.632 in 2022. Judging from the average result of Grover's value is 0.604, where this value is less than (<-0.02), the company PT Matahari Putra Prima Tbk in 2018-2022 is said to be experiencing unhealthy conditions or financial distress. The decline in the value of the G-Score is in line with the decline in EBIT and net profit of the company due to the large value of the cost of expenses, which reduces the company's revenue.

Analysis of the Springate model at PT Matahari Putra Prima Tbk during the 2018-2022. Springate values tend to fluctuate. Starting from -0.128 in 2018, this value rose to 0.381 in 2019 before dropping again to 0.099 in 2022. The average result of the Springate model is 0.098, indicating that the company is in a state of financial distress. The high value of the coefficient can be concluded from the focus of the Springate method, which is to assess the company's profitability. Using four ratios that assess from three sides of the company's business and a strict cut-off value provides advantages for the Springate method in analyzing the company's condition. Thus, this study aligns with research conducted by Hariyani & Sujianto (2018), which shows a difference in the results of the methods used to predict company bankruptcy.

By conducting an annual analysis of the three financial distress models, we can understand the trends and averages of the values given. The difference in interpretation results between the Zmijewski, Grover, and Springate models is triggered by the difference in the ratio components used to calculate each method. So, it can be said that not all bankruptcy prediction methods have 100% accurate results in predicting a company's bankruptcy. The difference in ratio describes the focus of each method in analyzing the company's condition. The Zmijewski method analyzes the sides in terms of profitability, liquidity, and solvency. The Grover method focuses on profitability, while the Springate method analyzes profitability, liquidity, and activity. The coefficient value used in each method expresses how much weight and focus the method has in analyzing the company's condition. Meanwhile, the difference in the cut-off value compares the strictness of a method in describing the company's financial condition.

The Zmijewski model is more accurate for financial distress analysis based on available data, as it offers proven effective and reliable predictions regarding the risk of bankruptcy. Based on data from 2018 to 2022, Zmijewski's score shows a high result, which strongly reflects the company's financial condition, which is experiencing a decline in profits, and provides a clear indication of potential financial distress.

5. Conclusion

Using Zmijewski for five years, 2018 – 2022, PT Matahari Putra Prima Tbk predicts the company is financially distressed. The results of PT Matahari Putra Prima Tbk's analysis for the five years 2018 – 2022 using Grover predict the company's financial distress. PT Matahari Putra Prima Tbk, using Springate for five years for 2018 – 2022, predicts that the company is in financial distress.

PT Matahari Putra Prima Tbk for five years for 2018 – 2022 using Zmijewski, Grover, and Springate indicated that the company was experiencing Financial Distress. The Zmijewski method is analyzed regarding profitability, solvency, and liquidity; the Grover method focuses on profitability, while the Springate method analyzes profitability, liquidity, and activity. The coefficient value used in each method expresses how much weight and focus the method has in analyzing the company's condition. Meanwhile, the difference in the cut-off value compares the strictness of a method in describing the company's financial condition.

It is better for PT. Matahari Putra Prima Tbk evaluates financial performance to bring the company to a better state. The company's value that shows the risk of financial distress, PT Matahari Putra Prima Tbk, focuses more on improving operational efficiency and reducing costs in improving cash management and reducing short-term debt to reduce the risk of financial distress. Conduct thorough audits to identify and address potential issues. Furthermore, maintain good communication with investors and stakeholders to build trust and support.

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