

Analysis of Corporate Bankruptcy Predictions PT. Gudang Garam Tbk using the Zmijewski Method (x-score) and Springate Method (S-Score) 2019-2023

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ABSTRACT

Corporate bankruptcy prediction using the Zmijewski (X-Score) and Springate (S-Score) methods is a way for companies to anticipate potential bankruptcy. The aim is to help companies identify potential bankruptcy risks in a specific year or period and understand factors that might place them in a danger zone. This research aims to evaluate the financial condition of PT Gudang Garam Tbk using the Zmijewski (X-Score) and Springate (S-Score) methods from 2019 to 2023. This type of research is descriptive quantitative. The results show that the bankruptcy prediction analysis using both methods for PT Gudang Garam Tbk over the five years consistently indicates a healthy financial status.

INTRODUCTION

In an era of increasing economic uncertainty, predicting corporate bankruptcy has become crucial for business stakeholders. Understanding the financial health of a company amidst market dynamics is essential for making informed decisions to ensure business continuity. Bankruptcy or financial failure of many companies can adversely affect the global economy (June Li 2012). Research shows that bankruptcy negatively impacts stakeholders, including investors and creditors (Adriana et al., 2012).

Various studies have been conducted to predict bankruptcy, initiated by Beaver (1966) and followed by Edward Altman (1968) and others. These studies were driven by numerous corporate bankruptcies in the US during the 1960s. The bankruptcy prediction models have been further developed in other countries, such as the Springate Model by Gordon L.V. Springate (1978) from Canada, the Data Stream's Model by Marais (UK, 1979), the Logistical Regression Model by Ohlson (1980), the Zmijewski Model (1983), the Fulmer Model (US, 1984), the CA-Score (Canada, 1987), the Artificial Neural Network Model by Thomaidis et al. (1998), and Hsieh et al. (2006).

The tobacco industry, despite its relatively stable market, faces challenges including stricter health regulations, shifting consumer preferences, and global economic uncertainties. These factors affect the financial performance of companies like PT Gudang Garam Tbk, making predictive models like the Zmijewski (X-Score) and Springate (S-Score) methods crucial for identifying companies vulnerable to financial distress.

This study employs the Zmijewski (X-Score) and Springate (S-Score) methods to analyze the bankruptcy prediction for PT Gudang Garam Tbk from 2019 to 2023. The goal is to assess the degree of bankruptcy risk.

LITERATURE REVIEW

- **Bankruptcy**

Bankruptcy is a condition that all companies strive to avoid (Susanti 2016:802). It can be predicted long before it occurs, typically within a two to five-year timeframe, allowing companies to detect potential financial distress early.

- **Zmijewski Method (X-Score)**

The Zmijewski (X-Score) method uses financial ratios to evaluate a company's performance, leverage, and liquidity. Initially tested on 40 bankrupt and 800 non-bankrupt companies, this model has a 99% accuracy rate (Avenhuis 2013). The formula is as follows:

$$X = -4,3 - 4,5X_1 + 5,7 X_2 - 0,004 X_3$$

Where :

X_1 = Net Income/Total Aktiva

X_2 = Total Liabilities/Total Aktiva

X_3 = Current Aktiva/Current Liabilities

A company is classified as distressed if $X > 0$ and healthy if $X < 0$.

- **Springate Method (S-Score)**

Developed by Gordon L.V. Springate in 1978, this model uses Stepwise Multiple Discriminant Analysis, selecting four financial ratios from 19, with an accuracy rate of 92.5% (Meiliawati & Isharijadi 2016). The formula is as follows:

$$S = 1,03(X1) + 3,07(X2) + 0,66(X3) + 0,4(X4)$$

Where :

X_1 = Working Capital / Total Assets

X_2 = EBIT / Total Asssets

X_3 = EBT / Current Liabilities

X_4 = Sales / Total Assets

A company is considered potentially bankrupt if $S < 0.862S$, at risk if $0.862 \leq S \leq 1.062$, and healthy if $S > 1.062$.

- **Framework of Thinking**

Based on the explanations above, as outlined in the problem background, the author has developed the conceptual framework for this research as follows:

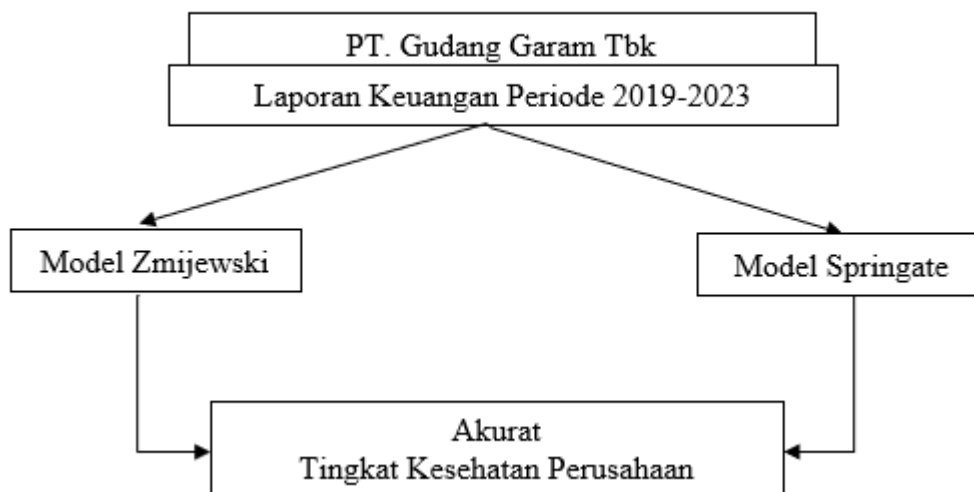


Figure 1. Framework of Thinking

METHODOLOGY

Descriptive analysis using a quantitative approach was employed as the data analysis technique in this study. To analyze corporate bankruptcy, the researcher made predictions using the Zmijewski and Springate methods. The data source used in the research was secondary, obtained from the Indonesia Stock Exchange and company websites. In this study, documentation in the form of company financial statements was used as the data collection technique. The first step the researcher took was to calculate several financial ratios required in the Zmijewski and Springate formulations. After obtaining the calculation results, the researcher then analyzed the financial health condition of the company based on the predetermined cut-off points. The cigarette company PT Gudang Garam Tbk, listed on the Indonesia Stock Exchange, was used as the

population in this study. The research sample was adjusted to the research objectives. Purposive sampling was employed as the sampling technique using the following criteria: (1) PT Gudang Garam Tbk is listed on the Indonesia Stock Exchange; (2) PT Gudang Garam Tbk's annual financial statements have been published consecutively for 5 years from 2019 to 2023.

RESEARCH RESULT AND DISCUSSION

The results of this study are presented in the form of all calculated ratios by processing data from the annual financial statements of PT Gudang Garam Tbk from 2019 to 2023. In this study, two bankruptcy prediction analysis methods were applied, namely the Zmijewski Method (X-Score), which identifies three independent variables used in the formula, and the Springate Method, which is analyzed using four independent variables used in the formula. The following are the results of the ratio calculations for the Zmijewski Method (X-Score) and the Springate Method (S-Score):

Table 1. Ratio Calculation Results
Zmijewski Method (Z-Score) Dan Metode Springate Method (S-Score)

PT GUDANG GARAM TBK					
Zmijewski Method (X-Score)					
Rasio	2019	2020	2021	2022	2023
X1	110.523.819	114.477.311	124.881.266	124.682.692	118.952.997
	78.647.274	78.191.409	89.964.369	88.562.617	92.450.823
	1,41	1,46	1,39	1,41	1,29
X2	27.716.516	19.668.941	30.676.095	30.706.651	31.587.980
	78.647.274	78.191.409	89.964.369	88.562.617	92.450.823
	0,35	0,25	0,34	0,35	0,34
X3	52.081.133	49.537.929	59.312.578	55.445.127	54.115.182
	25.258.727	17.009.992	28.369.283	29.125.010	29.536.433
	2,06	2,91	2,09	1,90	1,83
Springate Method (S-Score)					
X1	26.822.406	32.527.937	30.943.295	26.320.117	24.578.749
	78.647.274	78.191.409	89.964.369	88.562.617	92.450.823
	0,34	0,42	0,34	0,30	0,27
X2	10.880.704	7.647.729	5.605.321	2.779.742	5.324.516
	78.647.274	78.191.409	89.964.369	88.562.617	92.450.823
	0,14	0,10	0,06	0,03	0,06
X3	14.487.736	9.663.133	7.286.846	3.646.521	6.860.816
	25.258.727	17.009.992	28.369.283	29.125.010	29.536.433
	0,57	0,57	0,26	0,13	0,23
X4	110.523.819	114.477.311	124.881.266	124.682.692	118.952.997
	78.647.274	78.191.409	89.964.369	88.562.617	92.450.823
	1,41	1,46	1,39	1,41	1,29

Data Processed, 2024

After calculating the ratio results from both bankruptcy prediction analysis methods, each ratio is then multiplied by its respective coefficient weight and summed up according to the calculation formulas of the Zmijewski and Springate methods. Based on the known calculation results, the next step is to categorize according to the predetermined classifications. The bankruptcy prediction analysis results from both methods can be seen in the summary table of the calculation results presented in the following table:

Table 2. Recapitulation of Calculation Results of Zmijewski Model Criteria

PT GUDANG GARAM TBK			
Year	Zmijewski Model	X-Score	Predictions
2019	$X = -4,3 - 4,5 (1,41) + 5,7(0,35) + 0,004(2,06)$	-8,64	Healthy
2020	$X = -4,3 - 4,5 (1,46) + 5,7(0,25) + 0,004(2,91)$	-9,43	Healthy
2021	$X = -4,3 - 4,5 (1,39) + 5,7(0,34) + 0,004(2,09)$	-8,61	Healthy
2022	$X = -4,3 - 4,5 (1,41) + 5,7(0,35) + 0,004(1,90)$	-8,64	Healthy
2023	$X = -4,3 - 4,5 (1,29) + 5,7(0,34) + 0,004(1,83)$	-8,16	Healthy

Data Processed, 2024

Based on the calculation using the Zmijewski model, it can be seen that all financial data of PT Gudang Garam Tbk from 2019 to 2023, which were studied, obtained scores below 0 or negative, where the value of $X > 0$, which is categorized as a healthy company. The conclusion of the data above is that the financial report of PT Gudang Garam is considered healthy.

Table 3. Recapitulation of Springate Model Criteria Calculation Results

PT GUDANG GARAM TBK			
Year	Springate Model	S-Score	Predictions
2019	$S = 1,03(0,34) + 3,07(0,14) + 0,66(0,57) + 0,4(1,41)$	1,72	Healthy
2020	$S = 1,03(0,42) + 3,07(0,10) + 0,66(0,57) + 0,4(1,46)$	1,70	Healthy
2021	$S = 1,03(0,34) + 3,07(0,06) + 0,66(0,26) + 0,4(1,39)$	1,26	Healthy
2022	$S = 1,03(0,30) + 3,07(0,03) + 0,66(0,13) + 0,4(1,41)$	1,05	Healthy
2023	$S = 1,03(0,27) + 3,07(0,06) + 0,66(0,23) + 0,4(1,29)$	1,13	Healthy

Data Processed, 2024

The bankruptcy prediction analysis using the Springate method on PT Gudang Garam Tbk from 2019 to 2023 indicates that each year, the company falls

into the healthy category (not bankrupt), as the scores obtained are above 0.862. This is a positive indicator for the company's future.

A company in the healthy category (not bankrupt) typically utilizes its available working capital more effectively, resulting in positive outcomes. It can also be said that the company is not experiencing severe financial difficulties and its ability to generate profits is improving.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The results of this study in predicting bankruptcy using the Zmijewski (X-Score) and Springate (S-Score) methods at PT. Gudang Garam Tbk show that the company is in a healthy state. Both methods used by the researchers, including the Zmijewski (X-Score) and Springate (S-Score), indicate the same condition based on the calculations obtained. The financial health analysis from 2019 to 2023 shows that PT. Gudang Garam Tbk is consistently in a healthy condition. This suggests that PT. Gudang Garam Tbk can develop its financial performance and generate interesting ideas or innovations to ensure the company continues to grow and avoid the risk of bankruptcy.

However, it should be noted that these methods are only predictions or estimates and cannot be said to be completely accurate or 100% accurate. The predictions are not entirely reliable because a company's bankruptcy can be determined by various unpredictable factors. There is always economic uncertainty that can affect a company's continuity, including the possibility of bankruptcy. Business risks that may lead to bankruptcy include internal company issues, such as improper guidelines, or external issues, such as social, political, and cultural conditions. Nonetheless, these prediction methods are very useful for the company and managers as benchmarks to aid in making decisions or policies to save or avoid the company from bankruptcy that could threaten its future.

Recommendations

1. Companies estimated to be in a safe condition should strive to maintain their financial health. If a company is estimated to be in a vulnerable condition, it should aim to increase sales and maintain liquidity by better understanding the current market situation.
2. future research could use other bankruptcy prediction tools such as Ohlson, Grover, Shirata, CA Score, Fulmer, Farajzadeh Genetic, and McKee Genetic, extend the observation period, and increase the number of company samples to provide more generalized results.

ADVANCED RESEARCH

In writing this article the researcher realizes that there are still many shortcomings in terms of language, writing, and form of presentation considering the limited knowledge and abilities of the researchers themselves. Therefore, for the perfection of the article, the researcher expects constructive criticism and suggestions from various parties.

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