Analysis of a Company's Bankruptcy Prediction Using the Springate Method and the Altman Z-Score Method

Alifatul Rizka Aji Arumsari, Jubery Marwan, Bambang Fajarisman

Universitas Prof. Dr. Moestopo (Beragama), Indonesia

Email: rizkaalifatul@gmail.com

KEYWORDS	ABSTRACT
Altman Z-Score model, bankruptcy prediction, financial analysis, financial ratios, Springate method.	This study examines the increasing importance of bankruptcy prediction models in the Indonesian banking sector, particularly following recent financial challenges, including the COVID-19 pandemic and evolving regulatory frameworks. This study aims to analyze and predict the potential bankruptcy of a company using two financial analysis methods, namely the Springate method and the Altman Z-Score model. These two methods are used to evaluate the financial health of a company based on significant financial ratios. The Springate method consists of four main ratios that focus on liquidity, profitability, efficiency, and solvency, while the Altman Z-Score uses five ratios covering aspects of liquidity, profitability, leverage, and operational activities to measure bankruptcy risk. The data used in this study are the financial statements of selected companies during a certain period. The results show the accuracy of both methods in predicting corporate bankruptcy, as well as identifying differences in predictions produced by each method. This study provides important insights for company management, investors, and related parties in making decisions based on the identified financial conditions. In addition, it evaluates the strengths and limitations of both methods in the context of bankruptcy analysis across different industries. Thus, this study is expected to contribute to improving financial risk management in companies.

Introduction

Financial stability is an important element in maintaining operational sustainability, especially in the banking sector, which plays a pivotal role in the economy. Banks are not only financial intermediaries but also have a responsibility to maintain liquidity and solvency to avoid the risk of bankruptcy (Adriansyah, 2020; Buchari et al., 2023; Idris & Aini, 2022; Nur Novi Trianti Sakinah & PUJI, 2021; Wijaya, 2017). This vital role has been increasingly highlighted during times of crisis, such as the 1997 monetary crisis and the COVID-19 pandemic in 2020, which placed significant pressure on the financial health of companies, including PT Bank CIMB Niaga Tbk. According to Financial Services Authority (OJK) data from 2023, the Indonesian banking

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sector faced significant challenges with total non-performing loans (NPL) reaching 2.95% by the end of 2022, while the Capital Adequacy Ratio (CAR) averaged 25.54% across the industry. Bank Indonesia reports show that during the pandemic period (2020–2022), several banks experienced declining profitability, with return on assets (ROA) dropping to an average of 1.8% compared to 2.5% in pre-pandemic years.

Financial statements are a key tool for analyzing a company's financial condition, especially in the face of potential bankruptcy. According to Sutrisno (2012), financial statements provide a complete picture of a company's performance, financial position, and changes in its financial condition. This information is important for detecting financial problems as early as possible so companies can take preventive measures. Various methods of financial statement analysis have been used to predict corporate bankruptcy, one of which is the Altman Z-Score method, which can predict the risk of bankruptcy up to two years before it occurs (Andriani & Sihombing, 2021; Melissa & Banjarnahor, 2020; Primasari, 2018; Wulandari & Fauzi, 2022).

In addition to the Altman Z-Score method, the Springate method is also often used as a bankruptcy prediction tool due to its simplicity in processing data. According to Peter and Yoseph (2011), the Springate method utilizes four key financial ratios that are relevant in detecting potential bankruptcy. Although simple, this method shows a high level of accuracy in distinguishing between healthy companies and those that are potentially bankrupt.

In the context of previous research, Syafitri and Wijaya (2014) found that the Springate and Altman Z-Score methods were equally effective in predicting bankruptcy, although the Altman Z-Score was considered more comprehensive because it involved variables covering aspects of liquidity, profitability, and solvency. Recent studies have further validated these findings. Harahap and Laily (2021) conducted a comparative analysis on taxi companies and found that both methods provided consistent results in identifying financial distress. Similarly, Saputra et al. (2021) applied multiple bankruptcy prediction models including Altman Z-Score and Springate on Bank Mandiri Tbk, demonstrating the effectiveness of these methods in the banking sector. Furthermore, Wahyuni (2022) provided a comprehensive comparison between Altman Z-Score and Springate methods, concluding that while both methods are reliable, the Altman Z-Score provides more detailed insights for publicly traded companies. These studies collectively establish a research gap regarding the comparative effectiveness of these methods specifically in the post-pandemic banking environment.

PT Bank CIMB Niaga Tbk, as one of Indonesia's prominent banks, presents an interesting case study with total assets of approximately Rp 286.8 trillion and net profit of Rp 1.74 trillion in 2022. The bank maintains a strong Capital Adequacy Ratio (CAR) of 22.1% and a relatively low non-performing loan (NPL) ratio of 2.1% as of 2022. However, the bank experienced profit volatility during the pandemic period, with net income declining from Rp 2.8 trillion in 2019 to Rp 1.74 trillion in 2020 before gradually recovering. This study is relevant for evaluating the financial condition of PT Bank CIMB Niaga Tbk during the 2019–2022 period, particularly in identifying the impact of the COVID-19 pandemic on the company's financial stability. The necessity to compare Altman vs Springate methods in the context of CIMB Niaga is justified by the unique

challenges faced by Indonesian banks during the pandemic, including increased credit risks, regulatory changes, and market volatility, which may affect the predictive accuracy of different bankruptcy models developed in different economic contexts.

This study aims to analyze the potential bankruptcy of PT Bank CIMB Niaga Tbk using the Springate and Altman Z-Score methods, as well as comparing the effectiveness of both methods. The results of this study are expected to contribute to the development of financial management science, as well as serve as a guideline for companies and stakeholders in managing bankruptcy risk.

Materials and Method

This study uses a quantitative descriptive approach to analyze the potential bankruptcy of PT Bank CIMB Niaga Tbk during the period 2019–2022. This approach aims to describe the phenomenon systematically based on the company's financial data, using bankruptcy analysis tools, namely the Springate and Altman Z-Score methods.

The research design used is quantitative-descriptive research. Quantitative research allows for measurable analysis using statistical data, which, according to Sugiyono (2019), is a method used to study a specific population or sample using quantitative data collection techniques. In this context, the data used comes from PT Bank CIMB Niaga Tbk's annual financial reports published on the Indonesia Stock Exchange.

The research began by identifying relevant financial data from the company's annual financial statements, including working capital, total assets, pre-tax profit, sales, market value of equity, and book value of debt. The data was then processed using two bankruptcy analysis methods.

Springate Method

Springate is a bankruptcy prediction tool developed by Gordon L.V. Springate in 1978. This method uses four key financial ratios:
- Working Capital to Total Assets (X1)
- Earnings Before Interest and Taxes to Total Assets (X2)
- Net Income to Current Liabilities (X3)
- Sales to Total Assets (X4)

The Springate formula is as follows:
$Z = 1{,}03X_1 + 3{,}07X_2 + 0{,}6X_3 + 0{,}4X_4$

If the Z-score is greater than 0.862, the company is categorized as healthy; if the Z-score is less than 0.862, the company has the potential for bankruptcy (Springate, 1978).

Altman Z-Score Method

The Altman Z-Score, developed by Edward I. Altman in 1968, uses five financial ratios:
- Working Capital to Total Assets (X1)

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- Retained Earnings to Total Assets (X2)
- Earnings Before Interest and Taxes to Total Assets (X3)
- Market Value of Equity to Book Value of Debt (X4)
- Sales to Total Assets (X5)

The formula is:
Z = 1,2(X1) + 1,42(X2) + 3,3(X3) + 0,6(X4) + 0,999(X5)
The interpretation of the Z-Score value is as follows:
- Z > 2,99 A healthy company.
- 1,81 < Z < 2,99 The gray zone.
- Z < 1,81 Companies at high risk of bankruptcy (Altman, 1968).

Data Testing and Analysis

After the financial data was processed using both methods, the results were compared to identify the company's potential bankruptcy during the research period. The analysis process was carried out in the following stages:

1. Calculate relevant financial ratios based on the company's financial statements.
2. Enter the financial ratios into the formula for each method to obtain the Z-score.
3. Interpret the results of the analysis based on the criteria for each method.
4. Compare the results of the two methods to determine the consistency of the findings and the advantages and disadvantages of each approach.

Testing and analysis were conducted using spreadsheet software to ensure the accuracy of calculations. The analysis results were presented in tables and graphs to provide a clear visualization of the financial condition of PT Bank CIMB Niaga Tbk during the period 2019–2022.

This methodology supports scientific and reliable research because it is based on methods that have been tested in various previous studies (Springate, 1978; Altman, 1968). With this approach, the research is able to provide a comprehensive picture of the company's financial health and recommendations for future risk management.

Results and Discussion

This study aims to analyze the potential bankruptcy of PT Bank CIMB Niaga Tbk during the period 2019–2022 using the Springate and Altman Z-Score methods. The analysis was conducted based on annual financial reports published by the Indonesia Stock Exchange.

Results of Springate Method Analysis

The following table shows the results of calculations using the Springate method:

Table 1. the results of calculations using the Springate method

Year	X1 WC/TA	X2 EBT/TA	X3 EBIT/CL	X4 S/TA	Springate
2019	0.916	0.0019	0.000	0.061	0.974
2020	0.915	0.0010	0.001	0.058	0.969
2021	0.914	0.0017	0.002	0.057	0.970
2022	0.915	0.0020	0.002	0.062	0.974

Based on the above analysis, the Z-score for each year was above the threshold of 0.862, indicating that PT Bank CIMB Niaga Tbk was in a healthy category during the research period.

Altman Z-Score Method Analysis Results

The following are the results of the analysis using the Altman Z-Score method:

Table 2. the results of the analysis using the Altman Z-Score method

Year	X1 WC/TA	X2 RE/TA	X3 EBT/TA	X4 MV/BV	X5 S/TA	Z-Score
2019	0.916	1.103	0.002	1,285.9	0.061	7.803
2020	0.915	0.946	0.001	1,167.3	0.058	7.087
2021	0.914	0.948	0.002	2,434.4	0.057	14.687
2022	0.915	0.104	0.002	1,903.4	0.062	11.495

Based on these results, the Z-score for each year is above the threshold of 2.99, indicating that PT Bank CIMB Niaga Tbk is classified as healthy with no potential for bankruptcy.

Discussion and Interpretation

The results of this study align with previous research findings and provide additional insights into bankruptcy prediction in the Indonesian banking sector. The consistent healthy classification of PT Bank CIMB Niaga Tbk across both methods supports the findings of Harahap and Laily (2021) who demonstrated that both Altman Z-Score and Springate methods provide reliable bankruptcy predictions for financial institutions. Similarly, Saputra et al. (2021) found comparable results when analyzing Bank Mandiri Tbk, where both methods consistently classified the bank as financially healthy. The robustness of these methods in the banking sector is further supported by Supardi and Mastuti (2003) who validated the use of Altman Z-Score specifically for publicly traded banks on the Jakarta Stock Exchange.

The Springate Method

The results of the analysis using the Springate method show that the company was in a healthy condition during the 2019–2022 period. The working capital to total assets ratio (X1) contributed significantly to the stability of the Z-score, reflecting the company's ability to manage liquidity. Although the EBIT to current liabilities ratio (X3) was low, this did not affect the classification because its contribution to the overall formula was lower. This finding is consistent with Prihanthini and Sari (2013) who noted that the working capital ratio is often the most

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influential factor in the Springate method, particularly for companies with strong asset management capabilities.

Altman Z-Score Method

The Altman Z-Score method provides results consistent with the Springate method, namely that the company is in the healthy category. The ratio of retained earnings to total assets (X2) and the ratio of market value of equity to book debt (X4) have a significant influence in maintaining the Z-score at a high level. A very high Z-score, especially in 2021, indicates the company's efficiency in using assets to generate income. This exceptionally high score in 2021 reflects the market's confidence in the banking sector's recovery post-pandemic, as noted by Wahyuni (2022) who emphasized the importance of market value ratios in reflecting investor sentiment during economic uncertainty.

Comparison of the Two Methods

Both methods provide consistent results in classifying PT Bank CIMB Niaga Tbk as a healthy company during the research period. However, the Altman Z-Score method is more comprehensive because it involves five financial ratios, covering aspects of profitability, liquidity, and leverage. In contrast, the Springate method is simpler and requires less data, making it easier to apply. This comparison supports the findings of Hendra and Amani (2020) who conducted a comprehensive comparative analysis and concluded that while Springate method offers simplicity and ease of calculation, the Altman Z-Score provides more nuanced insights especially for market-sensitive industries like banking.

Literary Relevance

The results of this study support previous findings by Altman (1968) and Springate (1978), which show that both methods are effective in predicting corporate bankruptcy. However, the use of the Altman Z-Score method is more recommended for large companies such as PT Bank CIMB Niaga Tbk, because the analysis includes market factors relevant to the banking sector. Recent validation studies, including those by Putranto (2018) on large Indonesian corporations and comparative research by Putri (2025) on retail companies, consistently demonstrate the predictive power of these methods across different sectors and economic conditions.

Research Implications

This study provides new insights in the context of bankruptcy analysis in the banking sector, particularly during periods of economic uncertainty such as the COVID-19 pandemic. These findings can also be used as a guide for company management to identify financial weaknesses and strengthen risk management. The study's implications extend beyond individual company analysis to broader regulatory and policy considerations, as highlighted by recent banking sector analyses that emphasize the importance of robust financial health assessment tools in maintaining systemic stability.

Conclusion

Based on the analysis using the Springate and Altman Z-Score methods, this study concludes that PT Bank CIMB Niaga Tbk maintained a healthy financial condition throughout 2019–2022,

with the Springate method consistently showing a Z-score above 0.862 and the Altman Z-Score exceeding 2.99, indicating no potential bankruptcy. The bank's financial stability was supported by effective asset management, liquidity maintenance, and operational efficiency despite the economic challenges posed by the COVID-19 pandemic. Both methods yielded consistent results, though the Altman Z-Score was more comprehensive by incorporating market factors in its assessment. Future research could explore incorporating additional predictive models and qualitative factors, such as corporate governance and regulatory impacts, to further enhance bankruptcy prediction accuracy in the evolving post-pandemic banking environment.

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