International Journal Of Management Finance

Vol. 2, No. 2 December 2024, Page. 1-10

DOI: https://doi.org/10.62017/finance.v2i2.55

Comparation Of Bankruptcy Prediction At Retail Companies In Indonesia Using Altman, Zmijewski and Springate Methods

Oktavandi Widhi Prakoso [*1]
Maria Safitri [2]
Usman [3]
Amalia Nur Chasanah [4]

[1,2 3,4] Management Study Program, Faculty of Economics, Dian Nuswantoro University, Indonesia
*e-mail: 211202006443@mhs.dinus.ac.id[1], mariasafitri@dsn.dinus.ac.id[2], usman@dsn.dinus.ac.id[3], amalia.nurchasanah@dsn.dinus.ac.id[4]

Abstract

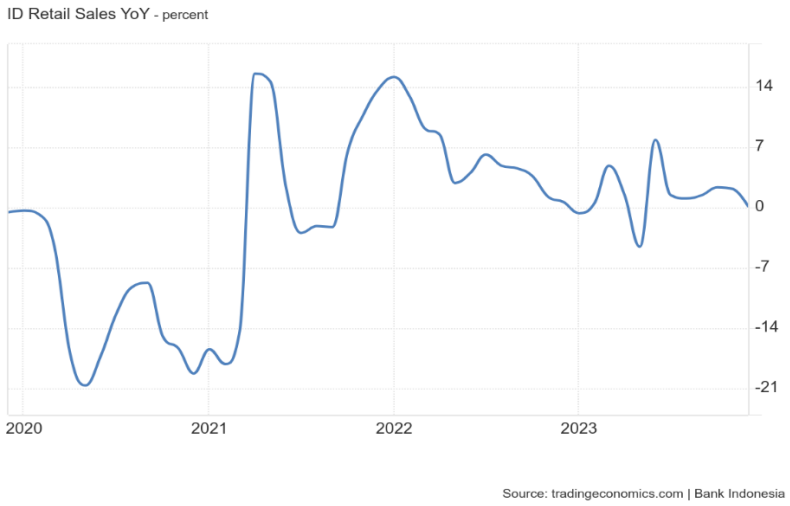
The Indonesian retail sector, a significant contributor to the nation's GDP, faces challenges due to digital transformation, shifting consumer behavior, and increased competition from e-commerce platforms, leading to potential bankruptcy risks among traditional retailers. This study aims to compare the Altman, Zmijewski, and Springate models in predicting bankruptcy of retail companies listed on the Indonesia Stock Exchange from 2019 to 2023. Using financial data from 11 retail companies, the study calculated bankruptcy predictions using the three models and performed statistical tests (Kolmogorov-Smirnov and Kruskal-Wallis tests) to compare their predictive accuracy. The results indicated that the Zmijewski model had the highest prediction accuracy at 90.91%, followed by the Springate model at 81.82%, and the Altman model at 45.45%. The Zmijewski model predicted one company as potentially bankrupt, while the other models provided varying predictions. The study concludes that the Zmijewski model is highest prediction rate in predicting bankruptcy in Indonesian retail companies. This has implications for investors and stakeholders in assessing financial health and making informed decisions.

Keywords: *Altman Method, Bankruptcy, Indonesia Retail Companies, Springate Method, Zmijewski Method*

INTRODUCTION

The retail sector significantly influences Indonesia's economy by contributing to the nation's Gross Domestic Product (GDP). Serving as one of the primary drivers of economic activity, the retail industry not only acts as a link between producers and consumers but also as a vital indicator of economic health. In the last decade, digital transformation and changes in consumer behavior have triggered an evolution in the retail industry necessitating the adoption of online and offline sales strategies while increasing competition can affect the operations and business strategies of retail companies (Shantilawati et al., 2024).

Graph1. Retail Sales In Indonesia



Source: tradingeconomics.com

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

The Indonesian retail sector has undergone significant fluctuations over the past few years. Based on data taken from the year-on-year (YoY) retail sales chart, there was a significant spike in April 2021, with an increase of 15.6%. This increase marks the culmination of the economic recovery after the sharp decline that occurred during the COVID-19 pandemic. However, after reaching its peak, the trend of retail sales gradually declined and showed instability that continued until June 2023, where the retail sales growth rate was recorded at only 2.7%.

The decline that occurred from April 2021 to June 2024 indicates that despite the rebound, the retail sector faces various challenges, including shifts in consumer behaviour, increased competition from e-commerce platforms, and macroeconomic changes. Traditional offline retailers are faced with great pressure, where this decline in sales is a serious risk signal to their business continuity.

The fluctuations that occurred during the period also show that the retail sector has not been fully stable. The inability to maintain a steady growth momentum indicates a weakness in traditional retailer business strategies. This is further exacerbated by the dominance of e-commerce which continues to erode the market share of offline retailers. In this context, it is important to evaluate the business model and financial performance of retail companies to identify potential bankruptcies as well as determine strategies that can be taken to improve their competitiveness.

The retail sector in Indonesia has undergone a significant shift with the increasing dominance of online retailers such as Tokopedia, operated by PT GoTo Gojek Tokopedia Tbk (GOTO), and Shopee, a subsidiary of Sea Limited. Based on a publication uploaded by Bloombreg, these two e-commerce giants continue to expand their market share, which jumped from 5% in 2019 to 25% in 2023.

Bankruptcy is one of the serious risks in the retail sector that often results from poor financial management and the inability to adapt to rapid market changes. Therefore, bankruptcy prediction models including the Altman Z-Score, the Zmijewski model, and the Springate model have been widely used to assess bankruptcy risk based on historical financial performance and current data(Almira et al., 2022).

Previous research conducted by (Rahmatullah et al., 2019) in a study titled 'Analysis of Financial Statements with the Z-Score Model as a Tool in Predicting Bankruptcy (Case Study on PT Ramayana Lestari Sentosa Tbk, PT Matahari Putra Prima Tbk, and PT Mitra Adiperkasa Tbk)' utilized financial data covering the period 2013 through 2017 to predict bankruptcy using the Altman method. The results of the study show that PT Ramayana Lestari Sentosa Tbk is categorized as a firm that is not bankrupt. Meanwhile, PT Matahari Putra Prima Tbk was categorized as not bankrupt from 2013 to 2015, but was included in the Grey Area in 2016 and finally categorized in the bankruptcy zone in 2017. As for PT Mitra Adiperkasa Tbk, the enterprise was categorized in the Grey Area in 2013 and 2014, but was in the Non Bankruptcy zone from 2015 to 2017.

Another study by (Fahira et al., 2024) researched retail sector companies listed on the Indonesia Stock Exchange, employing the Altman and Springate methods. Findings from the research show that PT Hero Supermarket Tbk, based on Altman's method, was not in the bankruptcy zone only in 2017. However, from 2018 to 2020, the company was in the bankruptcy zone. For PT Matahari Putra Prima Tbk, the same method shows that the company was consistently in the bankruptcy zone from 2017 to 2022. In addition, the Springate model states that the two companies were in the bankruptcy zone during the period 2017 to 2022.

A study performed by (Oma Putri et al., 2023) that aims to assess the potential for bankruptcy utilizing the Springate model in retail sector companies listed on the Indonesia Stock Exchange between 2016 and 2020. According to calculations using the Springate model, the study results indicate that in 2016 there were 3 companies predicted to face bankruptcy; in 2017, there were 2 companies predicted to face bankruptcy; in 2018, there was 1 company predicted to face bankruptcy; in 2019, there were 2 companies predicted to face bankruptcy; and in 2020, a total of

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

5 companies were predicted to face bankruptcy. It was found that out of 21 companies in the Retail Sub-Sector, 6 companies were predicted to face bankruptcy during the period 2016-2020. In addition, this model in predicting the potential bankruptcy of a company has an accuracy rate of 92.5%.

This research will analyze the financial health of retail companies between 2019 and 2023 using the Altman, Zmijewski, and Springate methods to predict bankruptcy risk. Data processing will be done with Python, a powerful tool in processing and analysis that allows this research to process financial datasets efficiently and with a high level of accuracy.

Study conducted by (Sahib et al., 2022) which compared the use of Python, SPSS, and Excel in data analysis found that there was no significant difference in the results obtained from the three software. However, the selection of Python in this study is based on its superiority in performing calculations using formulas specific to each bankruptcy analysis model. This is in line with the findings in the study which stated that Python has high flexibility and sufficient customization capabilities, allowing for efficient and precise application of calculation formulas for various bankruptcy analysis models.

In light of the aforementioned background, the researcher is interested to conduct research on bankruptcy prediction and plans to conduct a study titled "Comparison of Bankruptcy Prediction in Retail Companies Using Altman, Zmijewski, and Springate Methods".

LITERATURE REVIEW

Financial statements

Financial statements provide critical information that helps in bankruptcy prediction. This analysis includes an assessment of the quality of income and accumulation related to the probability of bankruptcy. Studies have shown that higher quality financial statements, reflecting low revenue management, are often associated with lower bankruptcy risk (Masdiantini, 2020).

Altman Method

The Altman model has gained wide recognition since its first introduction in 1968 by Edward I. Altman combined five different financial ratios to produce a score indicating the probability of bankruptcy (Cındık & Armutlulu, 2021). This score measures aspects such as working capital management efficiency, sustainability of profitability, and capital structure, providing a comprehensive metric for bankruptcy risk evaluation. The importance of the Altman model lies in its ability to consolidate various financial dimensions into a single interpretive score that makes it easier for analysts and investors to understand bankruptcy risk more quickly and accurately.

Springate Method

Formulated by Gordon L.V. Springate in 1978, the Springate model offers an alternative by using four financial ratios to estimate bankruptcy risk (Muzanni & Yuliana, 2021). Although simpler than the Altman model, the Springate model remains effective in providing valuable insights into corporate financial stability. Through ratios focusing on liquidity, operational efficiency, and leverage, the model helps identify companies that could potentially face financial difficulties.

Zmijewski's Method

Zmijewski's model introduces an innovative probit approach to predicting bankruptcy, combining three key financial variables to produce the probability of bankruptcy (Muzanni & Yuliana, 2021). Zmijewski's approach provides a more dynamic perspective in risk analysis by taking into account not only static financial conditions but also the direction in which a company's finances move over time. The model underscores the importance of considering operating cash flow and debt structure in bankruptcy risk evaluation, emphasizing key factors that often determine a company's long-term viability.

Signal theory

The signal theory put forward by Michael Spence in 1973 is an important concept in the information economy that addresses the problem of information asymmetry between two parties

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

(Cinintya et al., 2022.). In the context of corporate finance, this theory becomes particularly relevant in outlining how a company can use financial statements and other external communications as a mechanism to convey information about its performance and prospects to investors, shareholders, and other stakeholders.

The conceptual framework in this study is as follows :

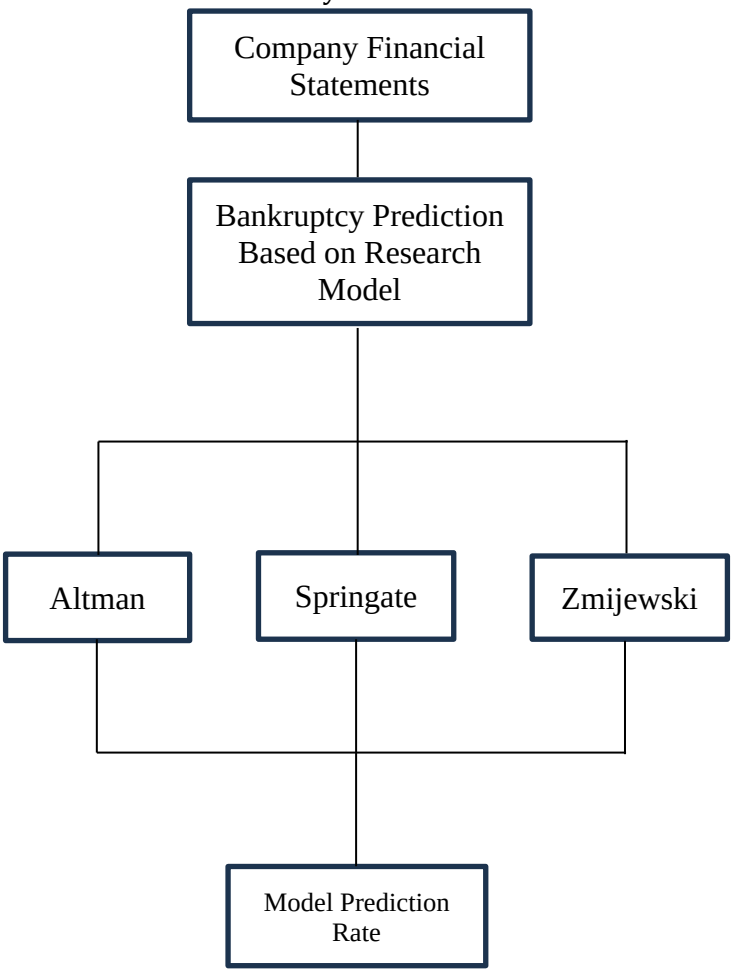


Figure1. Conceptual Framework
Source: Processed in 2024

Hypothesis Development

The Altman model is used to measure aspects of working capital management efficiency, profitability sustainability, and capital structure. On research conducted by (Salim & Ismudjoko, 2021) conducted on 22 coal mining industry companies showed that the Altman model was the most accurate model with an accuracy rate of 90.91% %. In addition, research conducted by (Muzanni & Yuliana, 2021) which was conducted on 15 Indonesian retail companies, Springate model showed 80% accuracy. Research conducted (Masdiantini & Warsiniasih, 2020) In manufacturing companies in the cosmetics and household use sub-sector as many as 4 companies from 2014-2018, the Zmijewski model showed 100% accuracy.

Altman, Zmijewski, and Springate's models are well-established approaches to predicting corporate bankruptcy, each emphasizing different financial indicators. Altman's model, developed in 1968, which measures aspects such as working capital management efficiency, profitability sustainability, and capital structure, provides comprehensive metrics for bankruptcy risk evaluation (Cındık & Armutlulu, 2021). On the other hand, Zmijewski's model emphasizes the ratio of operating cash flow and debt structure to predict financial hardship (Muzanni & Yuliana, 2021). Meanwhile, the Springate model, introduced by Gordon Springate in 1978, incorporates four financial ratios that focus on liquidity, profitability, and operational efficiency (Rachma Sari

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

et al., 2022). Given the different approaches each model takes, it is hypothesized that when used collectively, these models can provide same and accurate predictions of corporate insolvency, especially in contexts where individual models can demonstrate varying degrees of effectiveness. Therefore, the hypothesis of this study is formulated as follows:
H0: There is a difference between the Altman, Zmijewski, and Springate models in predicting bankruptcy for retail companies.
H1: There is no difference between the Altman, Zmijewski, and Springate models in predicting bankruptcy for retail companies.

METHOD

This study utilizes secondary data, which is obtained indirectly through intermediaries. Specifically, the data comprises financial ratios aligned with the method used and is found in the company's financial statements. The financial data utilized in this research comes from the company's financial statements available on their official website.

The company data used in this study are companies in the retail sector that are listed on the Indonesia Stock Exchange and have financial statements with the range of 2019 to 2023. There are 11 companies that are the sample in this study. The author chose the company because of the decline in stock prices, the closure of several stores, stagnant stock prices and challenges from e-commerce companies that are increasing their sales, Here are the companies that are the samples:

Table1. List Companies In This Study

No.	Companies	Stock Code
1	PT Matahari Putra Prima Tbk	MPPA
2	PT Mitra Adiperkasa Tbk	MAPI
3	PT Matahari Departement Store Tbk	LPPF
4	PT Hero Supermarket Tbk	HERO
5	PT Sumber Alfaria Trijaya Tbk	AMRT
6	PT Ramayana Lestari Sentosa Tbk	RALS
7	PT Supra Boga Lestari Tbk	RANC
8	PT Midi Utama Indonesia Tbk	MIDI
9	PT Aspirasi Hidup IndonesiaTbk	ACES
10	PT Catur Sentosa Adiprana	CSAP
11	PT Erajaya Swasembada	ERAA

The three bankruptcy prediction analysis methods used in this study have different calculation formulas depending on the financial ratios used for each method. The following will be described about the financial ratios that will be used for each method and the cut-off point used.

Altman Method

The following is an equation for Altman's model:

$$Z - score = 6{,}56X_1 + 3{,}26X_2 + 6{,}72X_3 + 1{,}05X_4$$

Explanation :
X_1 = WCTA (Working Capital / Total Assets)
X_2 = RETA (Retained Earnings / Total Assets)
X_3 = EBITTA (Earnings Before Interest and Taxes / Total Assets)
X_4 = BVETL (Book Value of Equity / Total Liabilities)

If Z > 2,60, the company is considered not bankrupt. If 1,10 ≤ Z ≤ 2,60, the company falls within the grey area. If Z < 1,10, the company belongs to the bankruptcy category (Muzanni & Yuliana, 2021).

Zmijewski Method

Here is the equation for Zmijewski's model:

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

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

Explanation :
X1: Net Income / Total Assets
X_2: Total Liabilities / Total Assets
X_3: Current Assets / Current Liabilities

The cut-off score for the Zmijewski model is 0. Companies with X ≥ 0 are predicted to go bankrupt. Conversely, if X < 0, the company is not predicted to go bankrupt (Muzanni & Yuliana, 2021).

Springate Method

Here is the Springate model equation.

$$S = 1{,}03X_1 + 3{,}07X_2 + 0{,}66X_3 + 0{,}4X_4$$

Explanation:
X_1: Working Capital / Total Assets
X_2: Earning Before Interest and Taxes / Total Assets
X_3: Earning Before Taxes / Current Liablities
X_4: Sales / Total Assets

Here cut-off score for this model is 0,862. If the score of S < 0,862, the company is considered bankrupt. If S > 0,862, the company is considered not bankrupt(Muzanni & Yuliana, 2021).

In this research, data processing was performed using Python. The authors employed the Kolmogorov-Smirnov test to evaluate whether the dataset adhered to a normal distribution. This non-parametric test was chosen due to its applicability to both small and large sample sizes and its minimal assumptions regarding data distribution.

This study employed the Kruskal-Wallis test, a non-parametric method used to assess whether significant differences exist among two or more independent groups on ordinal or interval-scaled variables that fail to meet the assumption of normal distribution (Junaidi, 2010).

RESULTS AND DISCUSSION

Descriptive Analysis

Based on the data that has been processed and processed using python, the author starts with descriptive analysis to gain a basic understanding of the distribution and trend of the data. The author calculated the Maximum, minimum, mean and standart deviation values for each bankruptcy prediction method analyzed.

Table 2. Descriptive Statistic Results

Method	N	Minimum	Maximum	Mean	Std. Deviation
Altman	11	-2,97	14,57	3,22	4,88
Zmijewski	11	-3,56	1,35	-0,98	1,37
Springate	11	-0,01	2,47	1,21	0,72

The summary statistics presented earlier were derived from the lowest, highest, average, and standard deviation of the 11 study samples corresponding to each model. For example, the Altman model exhibits an average score of 3.22, a lowest score of -2.97, and a highest score of 14.57. Similarly, other models were assessed. The Altman model demonstrates the greatest standard deviation among all models, suggesting that the data points in the Altman model are more diverse and dispersed from the average.

Calculation of Altman Method

The following are the result of Altman's model that uses the Z-Score to assess bankruptcy risk of companies in retail sector listed on the Indonesia Stock Exchange in 2019-2023:

Table 3. Altman Model Prediction Result

		YEAR						
NO	CODE	2019	2020	2021	2022	2023	AVERAGE	PREDICTION
1	MPPA	-2,55	-3,16	-1,89	-3,72	-3,52	-2,97	BANKRUPT

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

YEAR								
NO	CODE	2019	2020	2021	2022	2023	AVERAGE	PREDICTION
2	MAPI	4,14	1,41	2,53	3,73	3,54	3,07	NOT BANKRUPT
3	LPPF	6,83	-0,29	3,36	9,72	7,00	5,32	NOT BANKRUPT
4	HERO	2,65	0,43	-2,63	-2,17	-3,64	-1,07	BANKRUPT
5	ERAA	3,86	3,97	4,76	3,09	2,78	3,69	NOT BANKRUPT
6	ACES	12,16	27,21	10,34	11,91	11,25	14,57	NOT BANKRUPT
7	MIDI	-2,21	-0,15	0,12	0,81	2,30	0,17	BANKRUPT
8	CSAP	1,43	1,11	1,30	1,17	1,39	1,28	GREY AREA
9	AMRT	1,83	0,90	1,30	1,97	2,80	1,76	GREY AREA
10	RALS	9,46	7,24	8,16	8,66	9,06	8,52	NOT BANKRUPT
11	RANC	4,31	2,42	0,78	-0,9	-1,06	1,11	GREY AREA

The cut-off point in this Altman model is that if the Z value > 2,60, the company falls into the category of not going bankrupt. If the Z value is in the range of 1,10 -2,60, then the company is in the grey area category. Meanwhile, if the Z value < 1,10, then the company is included in the bankruptcy category.

According to the calculations derived from Altman's model, it is evident that three companies are projected to have no risk of bankruptcy: PT Matahari Putra Prima Tbk (MPPA), PT Hero Supermarket Tbk (HERO), and PT Midi Utama Indonesia Tbk (MIDI), as their average Z scores are below 1.10. Conversely, three companies fall within the grey area: PT Catur Sentosa Adiprana Tbk (CSAP), PT Sumber Alfaria Trijaya Tbk (AMRT), and PT Supra Boga Lestari Tbk (RANC), because their average Z scores range between 1.10 and 2.60.

Calculation of Zmijewski Method

The following are the result of Zmijewski's model that uses the X-Score to assess bankruptcy risk of companies in retail sector listed on the Indonesia Stock Exchange in 2019-2023 :

Table 4. Zmijewski Model Predction Result

YEAR								
NO	CODE	2019	2020	2021	2022	2023	AVERAGE	PREDICTION
1	MPPA	1,26	1,57	1,01	1,58	1,31	1,35	BANKRUPT
2	MAPI	-1,99	-0,54	-1,15	-1,78	-1,55	-1,4	NOT BANKRUPT
3	LPPF	-1,93	1,50	-0,28	-0,25	0,86	-0,02	NOT BANKRUPT
4	HERO	-2,26	-1,35	1,30	0,83	0,11	-0,27	NOT BANKRUPT
5	ERAA	-1,66	-1,76	-2,28	-1,29	-1,05	-1,61	NOT BANKRUPT
6	ACES	-3,95	-3,16	-3,42	-3,68	-3,59	-3,56	NOT BANKRUPT
7	MIDI	-0,17	-0,09	-0,24	-0,49	-1,76	-0,55	NOT BANKRUPT
8	CSAP	-0,35	-0,17	-0,23	-0,19	-0,44	-0,28	NOT BANKRUPT
9	AMRT	-0,45	-0,46	-0,79	-1,15	-1,67	-0,9	NOT BANKRUPT
10	RALS	-3,32	-2,50	-2,79	-2,96	-3,04	-2,92	NOT BANKRUPT
11	RANC	-2,14	-1,21	-,054	-0,11	0,47	-0,61	NOT BANKRUPT

In the Zmijewski model, the cut-off point used is that if the X value of a company exceeds 0, the company is classified as bankrupt. However, if the company has an X value of less than 0, the company is predicted not to go bankrupt.

The results of the calculation and prediction of the Zmijewski model are shown in the table above. Based on the results of the calculation of the Zmijewski model, it can be understood that there is one company that is predicted to have the potential to go bankrupt, namely PT Matahari Putra Prima Tbk (MPPA) because the average value of X is more than 0. Meanwhile, ten companies are predicted not to experience bankruptcy because the average value X is less than 0.

Calculation of Springate Method

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

The following are the results of Springate's model that uses the S-Score to assess bankruptcy risk of companies in retail sector listed on the Indonesia Stock Exchange in 2019-2023 :

Table 5. Springate Model Predction Result

YEAR								
NO	CODE	2019	2020	2021	2022	2023	AVERAGE	PREDICTION
1	MPPA	0,48	0,13	0,36	0,23	0,43	0,33	BANKRUPT
2	MAPI	1,43	0,31	0,83	1,4	1,22	1,04	NOT BANKRUPT
3	LPPF	2,47	-0,58	1,22	1,73	0,98	1,16	NOT BANKRUPT
4	HERO	0,62	-0,13	-0,37	-0,05	-0,13	-0,01	BANKRUPT
5	ERAA	1,86	1,83	2,40	1,69	1,61	1,88	NOT BANKRUPT
6	ACES	3,43	2,17	2,21	2,25	2,28	2,47	NOT BANKRUPT
7	MIDI	0,66	0,87	0,91	1,11	1,27	0,96	NOT BANKRUPT
8	CSAP	0,88	6,45	0,87	0,82	0,74	1,95	NOT BANKRUPT
9	AMRT	1,56	1,33	1,54	1,71	1,80	1,59	NOT BANKRUPT
10	RALS	1,65	0,35	0,91	1,25	1,12	1,06	NOT BANKRUPT
11	RANC	1,45	1,30	0,72	0,47	0,37	0,86	NOT BANKRUPT

The threshold in the Springate model indicates that when an S value exceeds 0.862, the firm is deemed not at risk of bankruptcy, whereas if the S value falls below 0.862, the firm is classified as potentially facing bankruptcy. The outcomes from the Springate model's calculations and predictions are presented in the table above.

According to the findings from the Springate model analysis presented in the table above, it is evident that two companies are at risk of bankruptcy, specifically PT Matahari Putra Prima Tbk (MPPA) and PT Hero Supermarket (HERO), as their average S-Score values are below 0.862. Conversely, nine companies are not at risk of bankruptcy because their average S-Score values exceed 0.862.

Prediction Rate of Bankruptcy Method

Table 6. Prediction Rate

Result	Altman Model	Zmijewski Model	Springate Model
Bankrupt	3	1	2
Grey area	3	0	0
Not bankrupt	5	10	9
Total	11	11	11
Prediction Rate	45,45%	90,91%	81,82%

Measurement of the Prediction rate of the bankruptcy prediction model used to answer H0 is carried out by comparing the prediction results to see if there is a difference. The prediction rate test can show the prediction model that has the highest level of prediction rate. In addition, this calculation was carried out to find out which model had the highest prediction rate in predicting the bankruptcy of the company used as the research sample.

Based on the results of the above calculation tabulation, it can be concluded that the prediction rate from the highest to the lowest in a row is the Zmijewski model with prediction rate of 90,91% followed by the Springate model at 81,82% and the Altman at 45,45%.

H1 is therefore rejected, because the bankruptcy prediction results of each model have different prediction levels. Based on the table above, the one with the highest prediction rate is the Zmijewski model at 90.91%, then the Springate mode at 81.82% and the lowest is Altman at 45.45%.

Normality Test

The author conducted the Kolmogorov-Smirnov Test to assess the normality distribution of data. Here are the results of the Kolmogorov-Smirnov Test:

Table 7. Normality Test Result

Metode	P-value
Altman	0,52
Zmijewski	0,62

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

Metode	P-value
Springate	0,78

The results of the normality test showed that the P-value for the Altman model was 0.52, the Zmijewski model was 0.62, and the Springate model was 0.78. A P-value greater than 0.05, which is commonly used as a significance level, indicates that the data does not differ significantly from the normal distribution and thus can be considered normally distributed.

Hypothesis Test

In the hypothesis test, the researcher used the Kruskal-Wallis Test, which is a non-parametric method to assess the differences between bankruptcy prediction models.

Table 8. Hypothesis Test Result

P-Value
0,74

The results of the hypothesis test above show that the p-value of 0,74 is greater than 0,05 so that it can be stated that this test fails to reject H0 which states that there is a difference in the prediction results of the Altman method, Zmijewski method, and Springate method. So it can be said to reject H1 which states that there is no difference in the results of the Altman method, Zmijewski method and Springate method.

CONCLUSION

This study aims to assess bankruptcy predictions at retail company uses three methods, namely Altman, Zmijewski and Springate through the company's financial data during the period 2019 to 2023. Based on the analysis and data processing carried out, there are several conclusions that can be drawn :

1. The results of the Altman Model Prediction show that 5 companies (MAPI, LPPF, ERAA, ACES, RALS) are predicted not to go bankrupt, while there are 3 companies (CSAP, AMRT and RANC) are in the grey area. Beside that, there are three companies (MPPA, HERO, MIDI) predicted bankrupt. Using the Z-score cut-off point, the Z value > 2,60, the company falls into the category of not going bankrupt. If the Z value is in the range of 1,10 -2,60, then the company is in the grey area category. Meanwhile, if the Z value < 1,10, then the company is included in the bankruptcy category.
2. The results of the Zmijewski Model Prediction show that ten companies (MAPI, LPPF, HERO, ERAA, ACES, MIDI, CSAP, AMRT, RALS and RANC) are predicted not to go bankrupt with an X value below 0, while MPPA is predicted to go bankrupt because their X value is above 0.
3. The prediction results of the Springate model show there are two companies in bankrupt area namely MPPA and HERO. Beside that nine in not bankrupt area namely MAPI, LPPF, ERAA, ACES, MIDI, CSAP, AMRT, RALS and RANC.
4. Based on the results of the study, it can be seen that the Zmijewski model is the result that has the highest level prediction rate. When viewed from the real situation, HERO is not bankrupt, it can be seen from the existence of several stores that are still operating, then when viewed from the movement of stock prices on the Indonesia Stock Exchange MAPI, LPPF, HERO, ERAA, ACES, MIDI, CSAP, AMRT, RALS and RANC are still moving or fluctuating according to market conditions, while MPPA is stagnant. This shows that the market has lost confidence in the company's growth potential. In addition, the three methods used in this study show bankruptcy results from the fundamental side of the company. According to the Altman model which measures working capital, profits and capital structure show bankruptcy results, according to the Zmijewski model which measures cash flow and debt structure which declares bankruptcy and the last of the Springate model which measures liquidity, operational efficiency and loans declares bankruptcy

For further research, it is recommended to expand the number of samples as well as the analysis period. In addition, the use of other bankruptcy prediction models can provide a broader perspective. Researchers can also explore combinations of models that can improve prediction

Vol. 2, No. 2 December 2024, Page. 1-10
DOI: https://doi.org/10.62017/finance.v2i2.55

accuracy by taking into account other variables such as macroeconomic conditions and industry trends.

BIBLIOGRAPHY

Almira, N., Martini, R., Sari, K. R., Husin, F., & Zaliah. (2022). PREDIKSI RISIKO KEBANGKRUTAN MENGGUNAKAN FINANCIAL DISTRESS ANALYSIS. *Jurnal Riset Terapan Akuntansi*, *Vol. 6*(No.1), 56–62.

Cinintya, C., Gamayuni, R. R., & Dharma, F. (n.d.). *Transparansi, Hasil Audit Laporan Keuangan dan Korupsi pada Pemerintah Provinsi di Indonesia*. https://doi.org/10.24843/EJA.2022.v

Cındık, Z., & Armutlulu, I. H. (2021). A revision of Altman Z-Score model and a comparative analysis of Turkish companies' financial distress prediction. *National Accounting Review*, *3*(2), 237–255. https://doi.org/10.3934/NAR.2021012

Fahira, M. R., Musa, M. I., & Nurman, N. (2024). ANALISIS KEBANGKRUTAN DENGAN MENGGUNAKAN MODEL ALTMAN Z-SCORE DAN SPRINGATE PADA PERUSAHAAN SUB-INDUSTRI SUPERMARKET & CONVENIENCE STORE YANG TERDAFTAR DI BURSA EFEK INDONESIA. *Jurnal Manajemen*, *4*(2), 56. https://doi.org/10.26858/jm.v4i2.61183

Junaidi. (2010). Statistik Uji Kruskal-Wallis. *Research Gate*, 1–5. https://www.researchgate.net/publication/277868384

Mardiansyah, & Sunardi, A. (2022). *DASAR KOMPUTER DAN PEMROGRAMAN* (H. Kusnadi, Ed.; Cetakan Pertama). Unpam Press.

Masdiantini. (2020). Laporan Keuangan dan Prediksi Kebangkrutan. *Jurnal Ilmiah Akuntansi*, *Vol 5*, 196–220.

Muzanni, M., & Yuliana, I. (2021). TIJAB (The International Journal of Applied Business) Comparative Analysis of Altman, Springate, and Zmijewski Models in Predicting the Bankruptcy of Retail Companies in Indonesia and Singapore. *The International Journal of Applied Business)*, *5*(1), 81–93.

Oma Putri, D. R., Indah Mursalini, W., & Nasrah, R. (2023). Analisis Prediksi Kebangkrutan Menggunakan Model Springate (S-Score) Pada Perusahaan Sub Sektor Ritel Di Bursa Efek Indonesia 2016-2020. *Jurnal Manajemen Dan Akuntansi*, *3*(1), 01–20.

Rahmatullah, M., Sunarya, E., & Jhoansyah, D. (2019). Analisis Laporan Keuangan dengan Model Z-Score sebagai Alat dalam Memprediksi Bankcruptcy (Studi Kasus pada PT. Ramayana Lestari Sentosa Tbk, PT. Matahari Putra Prima Tbk, dan PT. Mitra Adiperkasa Tbk). *Jurnal Riset Inspirasi Manajemen Dan Kewirausahaan*, *3*(1). https://ejurnal.stimi-bjm.ac.id

Sahib, S., Al-Khaiat, J., Noori, M. Z., Mehmet, &, & Cengiz, A. (2022). Journal of Current Researches on Educational Studies (JoCuRES) www.jocures.com Application of the Regression Analysis in Python, SPSS and Microsoft Excel Programs. *Journal of Current Researches on Educational Studies*, *12*(2), 27–46. https://doi.org/10.26579/jocures.12.2.3

Salim, M. N., & Ismudjoko, D. (n.d.). *An Analysis of Financial Distress Accuracy Models in Indonesia Coal Mining Industry: An Altman, Springate, Zmijewski, Ohlson and Grover Approaches*. https://doi.org/10.32996/jefas

Shantilawati, I., Zebua, S., & Tarmizi, R. (2024). Jurnal Manajemen Retail Indonesia Penggunaan Digital Marketing Dalam Meningkatkan Penjualan Bisnis Retail. *Jurnal Manajemen Retail Indonesia*, *5*(1).