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HOTEL CHAIN BANKRUPTCY PREDICTION:
COMPARISON OF THE ALTMAN, SPRINGATE, AND ZMIJEWSKI MODELS

Aris Susetyo[1*], Dewi Susilowati[2]
[*1]Jenderal Soedirman University; arisputrabangsa75@gmail.com
[*2]Jenderal Soedirman University; dewi.susilowati@unsoed.ac.id

Abstract

Bankruptcy occurs when the liabilities or obligations of a person or business entity exceed the assets or ability to generate income to pay off the debt. This study aims to predict the bankruptcy of hotel chain companies listed on the NASDAQ and NYSE for 2020-2021. Bankruptcy prediction needs to be done so that the company can know its financial condition and make the right decisions for its sustainability. Bankruptcy prediction is also required so investors can decide to invest in a company. The bankruptcy prediction method in this study uses the Altman, Springate, and Zmijewski models. The Kruskal Wallis test results show a significant difference between the three methods used because it has a significant value. The results of this study reveal that the Springate model has the highest accuracy (80.56%) for predicting bankruptcy.

Keywords: bankruptcy prediction, hotel chain, Altman, Springate, Zmijewski

INTRODUCTION

The Covid-19 pandemic began in early 2020 and has devastated the world economy. The hotel sector is one of those that have been badly affected by this pandemic. Hotels that depend on the number of tourists have experienced a drastic decline due to the pandemic. UNWTO noted that international tourist arrivals fell by 71% due to the pandemic. The Central Statistics Agency (BPS) recorded a decrease in foreign tourist arrivals to Indonesia in early 2020, from 1.37 million visits in 2019 to 1.27 million. The decline in hotel occupancy since the pandemic's beginning was also recorded to have fallen. Based on BPS data, the occupancy rate of star-rated hotels in Indonesia in February 2020 was 49.22% and decreased to 32.24% in March 2020. In April 2020, there was a severe decline, with an occupancy rate of only 12.67%. In America, many hotels were declared bankrupt during the pandemic because they could not pay their obligations. According to the Voice of America (VOA Indonesia) website, based on the American Hotel & Lodging Association (AHLA) survey in 2020, more than 71% of hotels stated that they could only survive six months if their occupancy rate continued to decline. The decline in hotel occupancy impacts the hotel's

financial condition because hotel operations depend on the number of occupants. Many hotels are experiencing financial problems because of this pandemic. Economic issues experienced by the company can cause the company to be predicted to experience bankruptcy.

Bankruptcy is an important phenomenon related to compromises in financial performance and company activities (Prabowo, 2019). Bankruptcy is an essential issue that companies need to be aware of. If a company experiences financial difficulties (financial distress), the company may experience business failure or bankruptcy (Prasandri, 2018). Companies need to conduct bankruptcy prediction analysis to anticipate and increase awareness of the risks that lead to bankruptcy. Research needs to be done to get an early warning of bankruptcy. Companies indicated to be bankrupt can make managerial improvements before going bankrupt.

The first multivariate study was proposed by Altman (1968) using multiple discriminant analyses using five financial ratios to predict the bankruptcy of manufacturing companies. The ratios used in the Altman model include the working capital to total assets ratio, retained earnings to total assets ratio, earnings before interest and taxes to total assets, the market value of equity to book value of debt ratio, and sales to total assets ratio. Altman revised it in 1984 by changing the variable market value of equity to book value of debt ratio to book value of equity to book value of total debt to apply to non-public companies. Altman modified his analysis model again in 1995 by eliminating the variable sales to total assets ratio so that it could be applied to non-manufacturing companies (Ramadhani & Lukviarman, 2009). Springate (1978) developed Altman's model by using step-wise multiple discriminate analysis and choosing four of 19 popular financial ratios to distinguish the bankruptcy conditions of a company. The four ratios used in the Springate model include working capital to total assets, net profit before interest and taxes to total assets, net profit before taxes to current liabilities, and sales to total assets. Zmijewski (1984) developed a bankruptcy prediction model using a cumulative normal probability distribution. Zmijewski's analysis model uses return on investments, debt ratio, and current ratio to predict financial distress that leads to company bankruptcy.

The prediction of corporate bankruptcy is one of the main themes in the financial management literature (Aminian et al., 2016). Research on bankruptcy prediction conducted by Fitz Patrick in 1932

using financial ratios with univariate analysis revealed a relationship between financial ratios and forecasts of company bankruptcy (Beaver, 1966). Beaver recommends using multiple ratios because it is thought to provide a higher predictive ability than a single ratio.

Research on comparative bankruptcy prediction models has been carried out by several researchers using the Altman, Springate, and Zmijewski bankruptcy prediction models. Renalita & Tanjung's study (2020) shows that the Altman model produces the highest accuracy in predicting bankruptcy. Seto & Trisnaningsih (2021) also stated that the Altman model is the most suitable because it has the highest predictive level compared to other models. Different results were found from Hariyani & Sujiyanto's research (2017), where the accuracy level of the Altman model has a percentage of 0% in predicting the bankruptcy of Islamic bank companies in Indonesia, so it can be concluded that the Altman model is not suitable for use as an analysis tool for bankruptcy prediction. Angkasa et al. (2020) concluded that the Springate model is the best model for estimating corporate bankruptcy, with an accuracy of 85.71%. Prasandri (2018), in his research, compared the Altman, Springate, and Zmijewski models for estimating the default of cigarette companies in Indonesia and concluded that the Zmijewski model was the best model to use in predicting bankruptcy. Fauzan & Sutiono (2017), in their research, concluded that the Springate and Zmijewski models have an accuracy of 0%, so they are not suitable for use in predicting the bankruptcy of banking companies in Indonesia.

Research on the prediction of bankruptcy in the hotel sector was carried out by several researchers, including Gao, L. (1999), who assessed the potential for bankruptcy from a microeconomic and macroeconomic perspective using Altman's multiple discriminant analysis models as the analytical model. Barreda et al. (2017) used the Altman multiple discriminant analysis models and the Logit model to estimate the bankruptcy of hospitality companies in America. The results of his research show that the Altman model is better (100%) than the logit model (73.3%) in predicting the bankruptcy of hospitality companies in America. Using the Altman model in predicting bankruptcy during a pandemic indicates a low significance level for the potential insolvency of companies in the hotel, restaurant, and tourism sub-sectors listed on the Indonesia Stock Exchange (Fajarsari, 2022). Different results were found in the study by Armadani et al. (2021), where Altman's model shows the potential for bankruptcy for several service

and hotel sector companies over a quarterly period during the pandemic. The difference in the results of the research above motivated the researcher to conduct research with the formulation of the problem of whether the Altman, Springate, or Zmijewski models have the highest accuracy in predicting hotel chain bankruptcy and whether there are different results from the analysis of the Altman, Springate, and Zmijewski models in estimating the default of hotel chain companies.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A. Bankruptcy

Bankruptcy is an important phenomenon related to compromises in financial performance and company activities (Prabowo, 2019). Bankruptcy can be defined as uncertainty regarding the ability of a company to continue its operations if its financial condition experiences a decline (Lesmana, 2003). Companies experience bankruptcy when their total liabilities exceed total assets. Brigham (2001) defines bankruptcy as an economic failure (Economic Distressed) and financial failure (Financial Distressed). Financial failure (Financial Distressed) is when the company has difficulty getting funds in cash and working capital. Financial failure can also be interpreted as insolvency, distinguishing between cash flow and stock bases. If a company is experiencing financial distress, then the company is experiencing business failure or bankruptcy (Prasandri, 2018).

B. Modified Altman Z Score Model

The Altman model uses Multiple Discriminant Analysis (MDA) to predict bankruptcy with the term Z-Score. Altman uses a multivariate formula to measure the financial health of a company. The following formula determines the modified Altman Z-Score model:

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

The assessment standard for assessing the feasibility of a company in the Altman model is as follows:

Altman Z-Score Model Cut-Off Value

Cut-Off Value	Predicted
2.6 < Z	*Safe Zone* (Not Bankrupt)

1.1< Z<2.6	*Grey Zone* (Potential to Bankrupt)
Z<1.1	*Distress Zone* (Bankrupt)

Description:

X_1 = *Working Capital to Total Assets (WCTA)*

X_2 = *Retained Earned to Total Assets (RETA)*

X_3 = *Earning Before Interest and Tax to Total Assets (EBITTA)*

X_4 = *Market Value of Equity to Book Value to Total Debt (MVEBVD)*

H1: Altman's model has the highest rate of bankruptcy prediction for hotel chain companies listed on the NASDAQ and NYSE.

C. Springate model

Springate (1978) developed the model studied by Altman by using step-wise multiple discriminate analysis to select four of the 19 popular financial ratios to distinguish a company's bankruptcy condition. The Springate model is known as the S-Score. Springate models are as follows:

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

The final S-Score results from each company will be grouped according to the assessment standards set by Springate as follows:

Springate S-Score Model Cut Off Value

Cutt-Off Value	Predicted
0,862<S	Not Bankrupt
S<0,862	Bankrupt

Description:
X_1 = Working Capital to Total Assets (WCTA)
X_2 = Earning Before Taxes to Total Assets (EBITTA)
X_3 = Earning Before Taxes to Current Liabilities (EBITCL)
X_4 = Sales to Total Assets (SATA)

H2: The Springate model has the highest percentage rate in predicting bankruptcy for hotel chain companies listed on the NASDAQ and NYSE

D. Zmijewski model

Zmijewski (1984) developed a bankruptcy prediction model with a cumulative normal probability distribution. Zmijewski uses probit analysis which is applied to 40 companies that have gone bankrupt and 800 companies that are still surviving at that time.

The Zmijewski model is also known as the X-Score with the following calculation formula:

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

The calculation results obtained from the calculation of the formula above can be compared with the cut-off value as follows:

Zmijewski X-Score Model Cut-Off *Value*

Cut-Off Value	Predicted
0<X	Bankrupt
X<0	Not Bankrupt

Description:

X$_1$ = *Net Income to Total Assets (NITA)*

X$_2$ = *Total Assets to Total Debt (TATL)*

X$_3$ = *Current Assets to Current Liabilities (CACL)*

H3: The Zmijewski model has the highest accuracy in predicting the bankruptcy of hotel chain companies listed on the NASDAQ and NYSE

H4: There are differences in the results of the Altman, Springate, and Zmijewski model analysis in predicting bankruptcy for hotel chain companies listed on the NASDAQ and NYSE.

RESEARCH METHOD

Research Objects and Subjects

The object of this research is bankruptcy prediction, which is analyzed using financial ratios with the Altman, Springate, and Zmijewski models. In contrast, the subjects in this study are hotel chain companies listed on the NASDAQ and NYSE. The independent variable of this research is financial ratios which are grouped into three bankruptcy prediction analysis models as the dependent variable. In contrast, the dependent variable of this study is bankruptcy prediction.

The data used in this study is secondary data obtained from annual reports and historical reports of financial ratios for 2020-2021 hotel chain companies published on the company's website. The population in this study are hotel & resort sector companies listed on the NASDAQ and NYSE. There are 11 hotel & resort sector companies listed on the NASDAQ and 19 hotel & resort sector companies listed on the NYSE. Tests were carried out using the Kruskal-Wallis test to see if there were statistically significant differences between two or more groups of independent variables on the dependent variable on the interval/ratio scale and ordinal scale. The Kruskal-Wallis test is used to test the different hypotheses from the results of statistical analysis techniques. The test criteria are as follows: if the significance value obtained from the SPSS data processing results shows a value less than 0.05, then the hypothesis is accepted, whereas if the significance value is more significant than 0.05, then the hypothesis is rejected. The accuracy level of the calculation results for each bankruptcy prediction model is calculated by comparing the number of correct predictions with the number of samples (Angkasa et al., 2020). The formula for calculating the accuracy level is as follows:

Accuracy Rate=(Number of Correct Predictions)/(Number of Samples) x 100%

Sampling in this study was carried out using the purposive sampling method. The purposive method is based on specific considerations made by the researchers themselves, based on the characteristics and characteristics of the previously known population (Prasandri, 2018). The sample in this study was selected with the following criteria:

1. It is a hotel & resort sector company listed on the NASDAQ and NYSE.

2. Has a property network that is spread outside the United States.

3. Have financial reports for the entire research period that the company has published.

RESULTS AND DISCUSSION

Descriptive Analysis

The statistical test results for each prediction model can be seen in the following table:

Table 1. **Descriptive Statistic**

	N	Minimum	Maximum	Mean	Std. Dev
Altman	36	-14.00	816.00	274.7222	207.30745
Springate	36	-113.00	191.00	34.8056	64.86594
Zmijewski	36	-274.00	373.00	59.1667	128.75081
Valid N (listwise)	36				

Source: Processing 2022

Based on the results of the descriptive analysis, the Altman model has a minimum value of -14.00, a maximum value of 816.00, a mean value of 274.72222, and a standard deviation of 207.30745. The Springate model has a minimum value of -113.00, a maximum value of 191.00, a mean value of 34.8056, and a standard deviation of 64.86594. The Zmijewski model has a minimum value of -274.00, a maximum value of 373.00, a mean value of 59.1667, and a standard deviation of 128.75081

Normality test

Tabel 2. Tests of Normality

	Prediciton Models	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Score	Altman	.147	36	.048	.907	36	.005
	Springate	.096	36	.200[*]	.994	36	.999
	Zmijewski	.131	36	.124	.965	36	.311

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: Processing 2022

Based on the normality test above, it is known that the significance value of the prediction model for Altman (0.048), Springate (0.200), and Zmijewski, respectively, is (0.124)>0.05, so the assumption of normality is not fulfilled. The following hypothesis was tested using the Kruskal Wallis H test or the H-Test.

Kruskal Wallis test

Table 3. Kruskal Wallis Test
Test Statistics,b

	Skor
Kruskal-Wallis H	41.282
df	2
Asymp. Sig.	.000

a. Kruskal Wallis Test
b. Grouping Variable: Prediction Models

Source: Processing 2022

Based on the Kruskal Wallis Test, the significance value referred to in the table above is 0.000 <0.05, which

means there are differences in the results between the three bankruptcy prediction models for hotel chain

companies listed on the NASDAQ and NYSE in 2020 - 2021.

Bankruptcy Prediction Calculation
1**. Altman model**

Table 4. Altman Model Calculations

No	Company Name	Year	Z-Score	Predictions
1	Caesar Entertainment	2020	-0.14	Bankrupt
		2021	0.94	Bankrupt
2	Full House Resort Inc.	2020	1.74	Grey Area
		2021	4.81	Not Bankrupt
3	Huazu Group Limited	2020	0.70	Bankrupt
		2021	2.36	Grey Area
4	Marriott International	2020	6.45	Not Bankrupt
		2021	7.38	Not Bankrupt
5	Melco Resorts & Entertainment Limited	2020	3.07	Not Bankrupt
		2021	1.05	Bankrupt
6	Monarch Casino & Resort Inc	2020	6.59	Not Bankrupt
		2021	1.92	Grey Area
7	Playa Hotels & Resorts N.V.	2020	0.55	Bankrupt
		2021	1.85	Grey Area
8	Red Rock Resorts Inc.	2020	1.24	Grey Area
		2021	3.48	Not Bankrupt
9	Target Hospitality Corp.	2020	0.28	Bankrupt
		2021	1.25	Grey Area
10	Wynn Resorts Limited	2020	0.96	Bankrupt

No	Company Name	Year	Z-Score	Predictions
		2021	1.04	Bankrupt
11	Choice Hotels International Inc.	2020	4.39	Not Bankrupt
		2021	8.16	Not Bankrupt
12	GreenTree Hospitality Group Ltd.	2020	3.12	Not Bankrupt
		2021	1.50	Grey Area
13	Hilton Worldwide Holdings Inc.	2020	1.97	Grey Area
		2021	3.70	Not Bankrupt
14	Hyatt Hotels Corporation	2020	3.90	Not Bankrupt
		2021	3.38	Not Bankrupt
15	Intercontinental Hotels Group	2020	0.72	Bankrupt
		2021	2.02	Grey Area
16	Las Vegas Sands Corp.	2020	3.21	Not Bankrupt
		2021	2.69	Not Bankrupt
17	MGM Resorts International	2020	1.64	Grey Area
		2021	2.12	Grey Area
18	Wyndham Hotels & Resorts Inc.	2020	3.08	Not Bankrupt
		2021	5.78	Not Bankrupt

Source: Processed data, 2022

Based on the table above, nine (9) samples are predicted to experience bankruptcy because they have a Z-Score value below 1.1. There are 12 samples in the gray area because they have a Z-Score range of 1.1 to 2.6. Fifteen (15) samples are predicted not to go bankrupt because they have a Z-Score above 2.6.

2. **Springate Models**

Table 5. Springate Models Calculations

No	Company Name	Year	S-Score	Predictions
1	Caesar Entertainment	2020	-0.12	Bankrupt
		2021	0.42	Bankrupt
2	Full House Resort Inc.	2020	0.48	Bankrupt
		2021	1.23	Not Bankrupt
3	Huazu Group Limited	2020	0.17	Bankrupt
		2021	0.11	Bankrupt
4	Marriott International	2020	0.69	Bankrupt
		2021	0.59	Bankrupt

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No	Company Name	Year	S-Score	Predictions
5	Melco Resorts & Entertainment Limited	2020	-1.13	Bankrupt
		2021	-0.68	Bankrupt
6	Monarch Casino & Resort Inc	2020	1.01	Not Bankrupt
		2021	1.14	Not Bankrupt
7	Playa Hotels & Resorts N.V.	2020	-0.23	Bankrupt
		2021	0.17	Bankrupt
8	Red Rock Resorts Inc.	2020	0.42	Bankrupt
		2021	1.91	Not Bankrupt
9	Target Hospitality Corp.	2020	0.17	Bankrupt
		2021	0.66	Bankrupt
10	Wynn Resorts Limited	2020	-0.49	Bankrupt
		2021	-0.06	Bankrupt
11	Choice Hotels International Inc.	2020	0.78	Bankrupt
		2021	1.48	Not Bankrupt
12	GreenTree Hospitality Group Ltd.	2020	0.81	Bankrupt
		2021	0.51	Bankrupt
13	Hilton Worldwide Holdings Inc.	2020	-0.01	Bankrupt
		2021	0.54	Bankrupt
14	Hyatt Hotels Corporation	2020	-0.57	Bankrupt
		2021	0.19	Bankrupt
15	Intercontinental Hotels Group	2020	0.14	Bankrupt
		2021	0.88	Not Bankrupt
16	Las Vegas Sands Corp.	2020	-0.51	Bankrupt
		2021	-0.11	Bankrupt
17	MGM Resorts International	2020	-0.19	Bankrupt
		2021	0.77	Bankrupt
18	Wyndham Hotels & Resorts Inc.	2020	0.12	Bankrupt
		2021	1.24	Not Bankrupt

Source: Processed data, 2022

Based on the table above, there are 29 samples predicted to experience bankruptcy because they have an S-Score value of less than 0.862. Seven (7) samples are expected not to go bankrupt because they have an S-Score value of more than 0.862.

3. **Zmijewski Models**

Table 6. Zmijewski Models Calculation

No	Company Name	Year	X-Score	Predictions
1	Caesar Entertainment	2020	0.86	Not Bankrupt
		2021	0.84	Not Bankrupt
2	Full House Resort Inc.	2020	-0.12	Bankrupt
		2021	-0.07	Bankrupt
3	Huazu Group Limited	2020	0.55	Not Bankrupt
		2021	0.45	Not Bankrupt
4	Marriott International	2020	1.46	Not Bankrupt
		2021	1.21	Not Bankrupt
5	Melco Resorts & Entertainment Limited	2020	1.34	Not Bankrupt
		2021	1.65	Not Bankrupt
6	Monarch Casino & Resort Inc	2020	-1.88	Bankrupt
		2021	-2.74	Bankrupt
7	Playa Hotels & Resorts N.V.	2020	0.44	Not Bankrupt
		2021	-0.15	Bankrupt
8	Red Rock Resorts Inc.	2020	1.05	Not Bankrupt
		2021	0.95	Not Bankrupt
9	Target Hospitality Corp.	2020	0.57	Not Bankrupt
		2021	0.19	Not Bankrupt
10	Wynn Resorts Limited	2020	2.22	Not Bankrupt
		2021	1.78	Not Bankrupt
11	Choice Hotels International Inc.	2020	1,21	Not Bankrupt
		2021	-0,05	Bankrupt
12	GreenTree Hospitality Group Ltd.	2020	-2,00	Bankrupt
		2021	-1,19	Bankrupt
13	Hilton Worldwide Holdings Inc.	2020	2,10	Not Bankrupt
		2021	1,59	Not Bankrupt
14	Hyatt Hotels Corporation	2020	-0,26	Bankrupt
		2021	-0,13	Bankrupt
15	Intercontinental Hotels Group	2020	3,73	Not Bankrupt
		2021	2,94	Not Bankrupt
16	Las Vegas Sands Corp.	2020	0,80	Not Bankrupt
		2021	0,99	Not Bankrupt
17	MGM Resorts International	2020	0,67	Not Bankrupt
		2021	0,26	Not Bankrupt
18		2020	0,35	Not Bankrupt

No	Company Name	Year	X-Score	Predictions
	Wyndham Hotels & Resorts Inc.	2021	-0,31	Bankrupt

Source: Processed data, 2022

Based on the table above, there are 11 samples predicted to be bankrupt because they have an X-Score value of less than 0, and 25 samples are indicated not to go bankrupt because they have an X-Score value of more than 0.

Level of accuracy
1. Altman Model

Table 7.
Altman Model Accuracy Level Calculation

Sample Amount	Correct Prediction	Wrong Prediciton	Level of Accuracy	*Type Error*
36	9	27	25%	75%

Source: Processed data, 2022

The results of calculating the accuracy level of the Altman model in predicting bankruptcy for hotel chains listed on the NASDAQ and NYSE in the 2020-2021 period show an accuracy rate of 25% and an error rate or type of error with a percentage of 75%. In calculating the Altman model, nine (9) samples were predicted to experience bankruptcy, 12 samples with gray area prediction results, and 15 samples indicated non-bankrupt effects.

2. Springate Model

Table 8.
Springate Model Accuracy Level Calculation

Sample Amount	Correct Prediction	Wrong Prediciton	Level of Accuracy	*Type Error*
36	29	7	80.56%	19.44%

Source: Processed data, 2022

The results of calculating the accuracy rate of the Springate model in calculating bankruptcy prediction for hotel chains listed on the NASDAQ and NYSE in the 2020-2021 period show an accuracy rate of 80.56%

and an error rate or type error of 19.44%. In the calculation of the Springate model, there are 29 samples predicted to be bankrupt and seven (7) samples expected to be non-bankrupt.

3. Zmijewski Model

Table 9.
Zmijewski Model Accuracy Level Calculayion

Sample Amount	Correct Prediction	Wrong Prediciton	Level of Accuracy	*Type Error*
36	11	25	30.56%	69.44%

Source: Processed data, 2022

The results of calculating the accuracy rate of the Zmijewski model in calculating bankruptcy prediction for hotel chains listed on the NASDAQ and NYSE in the 2020-2021 period show an accuracy rate of 30.56% and an error rate or type error of 69.44%. In the calculation of the Zmijewski model, 11 samples were predicted to experience bankruptcy, and 25 samples were predicted not to go bankrupt.

CONCLUSION

The results of the bankruptcy prediction calculations for the Altman, Springate, and Zmijewski models with hotel chain companies listed on the NASDAQ and NYSE for the 2020-2021 period as samples, it can be concluded that there are differences between the bankruptcy prediction calculation results of the three models. The Springate bankruptcy prediction model has the highest percentage of accuracy in predicting bankruptcy for hotel chain companies listed on the NASDAQ and NYSE during the study period.

The results of bankruptcy prediction calculations using the three models show differences in the results of the bankruptcy prediction of the companies that are the research sample. For this reason, it is advisable for investors to do an analysis before investing in companies predicted to experience bankruptcy. For companies that are predicted to experience bankruptcy, it is better to carry out a strategy to deal with financial problems appropriately so that the company avoids bankruptcy. Based on Springate model calculations, companies that are predicted to go bankrupt need to improve their profit

management strategies, asset management, and short-term debt management and implement strategies to increase sales to avoid bankruptcy risk.

The limitations of bankruptcy prediction testing in this study are only using three prediction models: the Altman, Springate, and Zmijewski. There are still many bankruptcy prediction models that researchers still need to test, such as Foster, Ohlson, Fulmer, Taffler, and others. The companies sampled for this study are listed only on the NASDAQ and NYSE, not including hotel chain companies on other stock markets. Tests carried out with the three models are only predictions that cannot be stated with a 100% accuracy rate. Companies that are predicted to go bankrupt do not go bankrupt. This indicates that there are still other factors that can cause the company to go bankrupt.

REFERENCE

Alon, I., Ni, L., & Wang, Y. (2012). *Examining the determinants of hotel chain expansion through international franchising. International Journal of Hospitality Management, 31* (2), 379–386 .

Altman, EI (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The journal of finance* , *23* (4), 589-609.

Altman, EI, & Hotchkiss, E. (1993). *Corporate financial distress and bankruptcy* (Vol. 1998, pp. 105-110). New York: John Wiley & Sons.

dos Santos, RA, Mexas, MP, Meirino, MJ, Sampaio, MC, & Costa, HG (2020). Criteria for assessing a sustainable hotel business. *Journal of Cleaner Production* , *262* , 121347..

Aminian, A., Mousazade, H., & Khoshkho, OI (2016). Investigate the Ability of Bankruptcy Prediction Models of Altman and Springate and Zmijewski and Grover in Tehran Stock Exchange. *Mediterranean Journal of Social Sciences* , *7* (4), 208–214.

Amkas, K. (2020). *Impact of the Pandemic, Every Hour in the US, 400 Hotel Employees Are Laid Off* . https://www.voaindonesia.com/a/imbas-pandemi-tipe-jam-di-as-400-karyawan-hotel-di-phk/5692578.html accessed December 20, 2022.

Andrews, S. (2009). *Front-Office Training Manual.* 2nd Edition . New Delhi: Tata McGraw-Hill.

Kason, K., Angkasa, C., Gozali, YG, Wijaya, RA, & Hutahean, TF (2020). Comparative Analysis of the Accuracy of Predicting Financial Distress Using the Grover, Springate and Altman Z-Score Models in Mining Companies Listed on the Indonesia Stock Exchange in 2013-2017. *MEA Scientific Journal (Management, Economics, & Accounting)* , *4* (3), 441-458.

Armadani, A., Fisabil, AI, & Salsabila, DT (2021). Analysis of Company Bankruptcy Ratios during the Covid-19 Pandemic. *Journal of Accounting* , 99-108.

Barreda, AA, Kageyama, Y., Singh, D., & Zubieta, S. (2017). Hospitality Bankruptcy in United States of America: A Multiple Discriminant Analysis-Logit Model Comparison. *Journal of Quality Assurance in Hospitality and Tourism* , *18* (1), 86–106.

Beaver, WH (1966). Financial Ratios as Predictors of Failure. *Journal of Accounting Research* , 71–111.

Brida, JG, Gomez, DM, & Segarra, V. (2020). On the empirical relationship between tourism and economic growth. *Tourism Management* , *81* , 104131.

Eka Fauzi, S., & Badawi Saluy, A. (2021). Comparative Analysis of Financial Sustainability Using the Altman Z-Score, Springate, Zmijewski and Grover Models for Companies Listed at Indonesia Stock Exchange Sub-Sector Telecommunication Period. *The Asian Institute of Research Journal of Economics and Business* , *4* (1), 57–78.

Fajarsari, H. (2022). Financial Distress Analysis with Altman Model Calculations (Z-Score) in Hotel, Restaurant and Tourism Sub-Sector Companies during the Covid-19 Pandemic. *Jurnal Ilman: Journal of Management Science* , *10* (2), 49–57.

Fauzan, H., & Sutiono, F. (2017). Comparison of the Altman Z-Score, Zmijewski, and Springate Models in Predicting Bankruptcy. *Journal of Human Accounting Online* , *2* (1), 49–60.

Gao, L. (1999). Study of Business Failure in the Hospitality Industry from Both Microeconomic and Macroeconomic Perspectives. In *University of Nevada, Las Vegas.*

Gu, Z. (2002). Analyzing bankruptcy in the restaurant industry: A multiple discriminant model. *International Journal of Hospitality Management* , *21* (1), 25–42.

Hardani, Andriani, H., Ustiawaty, J., Utami, EF, Istiqomah, RR, Fardani, RA, Sukmana, DJ, & Auliya, NH (2020). *Qualitative and Qualitative Research Methods* . Yogyakarta: CV. Group Science Library .

Hariyani, DS, & Sujiyanto, A. (2017). Comparative Analysis of Altman Model, Springate Model, and Zmijewski Model in Predicting Bankruptcy of Islamic Banks in Indonesia. *Journal of Accounting* , *1* (1), 13–23.

Hasnunidah, N. (2017). *Educational research methodology* . Yogyakarta: media academy.

Kadim, A., & Sunardi, N. (2018). Altman Z-Score Analysis for Predicting Bankruptcy in State-Owned Banks (BUMN) in Indonesia in 2012-2016. *Journal of Securities (Stocks, Economics, Finance, And Investments)* , *1* (3), 142–156.

Lerinsa, F. (2021). Potential Bankruptcy of a Company Due to Mismanagement. *Simki Economic Journal* , *4* (1), 66–73.

Li, DD, & Li, S. (1999). An agency theory of the bankruptcy law. *International Review of Economics & Finance* , *8* (1), 1–24.

Meina, I., & Susetyo, A. (2021). Comparative Analysis of Altman, Springate and Zmijewski Models in Predicting Bankruptcy. *Journal of Accounting and Financial* , *3* (5), 1020–1029.

Paramita, RWD, Rizal, N., & Sulistyan, RB (2014). *Quantitative Research Methods* (3rd ed.). Malang: Widya Gama Press.

Prabowo, SCB (2019). Analysis on the Prediction of Bankruptcy of Cigarette Companies Listed in the Indonesia Stock Exchange Using the Altman (Z-Score) Model and Zmijewski (X-Score) Model. *Journal of Management Applications* , *17* (2), 254–260.

Peng, W. (2004). *Implementing Strategy in Hotel Chains: An Analysis of Strategy Implementation Action, Process and Context* (Doctoral dissertation, Glasgow Caledonian University).

Prasandri, EF (2018). Financial Distress Analysis Using the Z-Score (Altman), Springate, and Zmijewski Methods to Predict the Bankruptcy of Cigarette Companies Listed on the IDX in 2013-2016. *Journal of Economics and Accounting Research* , *3* (2), 713–734.

Ramadhani, AS, & Lukviarman, N. (2009). Comparison of Bankruptcy Prediction Analysis Using the First Altman, Revised Altman, and Modified Altman Models with Company Size and Age as Explanatory Variables (Study of Manufacturing Companies Listed on the Indonesia Stock Exchange). *Journal of Business Strategies* , *13* (1), 15–28.

Cape, PRS (2020). Comparative analysis of Altman Z-Score, Springate, Zmijewski and Ohlson models in predicting financial distress. *EPRA International Journal of Multidisciplinary Research (IJMR)* , *6* (3), 126-137.

Safri, H. (2018). Altman Z-Score Model Study in Detecting Bank Bankruptcy Potential. *Ecobisma Journal* , *5* (2), 54–70.

Schubert, SF, Brida, JG, & Risso, WA (2011). The impacts of international tourism demand on economic growth of small economies depend on tourism. *Tourism Management* , *32* (2), 377–385.

Seong, Y., & Nam, CS (2008). Capturing judgment policy on customers' creditworthiness: A lens model and SDT approach. *International Journal of Industrial Ergonomics* , *38* (7–8), 593–600.

Seto, BA, & Trisnaningsih, S. (2021). Using the Altman Z-Score, Springate, Zmijewski, and Grover Models in Predicting Financial Distress. *Rifle Proceedings* , *1* (2), 754–769.

Stocks, MH, & Harrell, A. (1995). The impact of an increase in accounting information level on the judgment quality of individuals and groups. *Accounting, Organizations and Society* , *20* (7–8), 685–700.

Sukendra, I. Komang. ICSA (2020). *Research Instruments* . Lumajang: Mahameru Press.

Yulianto, A. (2014). Measuring the Financial Health of Hospitality Services with the Altman, Springate and Zmijewski Models. *Journal of Knowledge Treasures* , *5* (1), 21–32.

Zmijewski, ME (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting research* , 59-82.