

Analysis of Financial Statements Using the Altman Z-Score, Springate and Zmijewski Models to Predict Bankruptcy

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Abstract: The purpose of this study was to find out how the Altman Z-Score, Springate and Zmijewski models analyze bankruptcy predictions for retail companies listed on the Indonesia Stock Exchange in 2017-2021. The population of this study are Retail Companies Listed on the Indonesia Stock Exchange in 2017-2021. The research sample consisted of 24 retail companies. The data analysis model used is the Altman Z-Score, Springate and Zmijewski models. This research was conducted by taking secondary data with specified criteria from the official website of the Indonesia Stock Exchange. Based on the results of the research, it shows that the Altman Z-Score model of the sixty retail companies studied has the potential to experience bankruptcy, the Springate model of eighty-six companies that have the potential to experience bankruptcy the Zmijewski model has thirty-eight companies that have the potential to experience bankruptcy. This research is useful as reference material regarding bankruptcy prediction.

Abstrak: Tujuan dari penelitian ini adalah untuk mengetahui bagaimana model Altman Z-Score, Springate dan Zmijewski menganalisis prediksi kebangkrutan perusahaan ritel yang terdaftar di Bursa Efek Indonesia tahun 2017-2021. Populasi penelitian ini adalah Perusahaan Ritel yang Terdaftar di Bursa Efek Indonesia Tahun 2017-2021. Sampel penelitian terdiri dari 24 perusahaan ritel. Model analisis data yang digunakan adalah model Altman Z-Score, Springate dan Zmijewski. Penelitian ini dilakukan dengan mengambil data sekunder dengan kriteria tertentu dari situs resmi Bursa Efek Indonesia. Berdasarkan hasil penelitian menunjukkan bahwa model Altman Z-Score enam puluh perusahaan ritel yang diteliti berpotensi mengalami kebangkrutan, model Springate delapan puluh enam perusahaan berpotensi mengalami kebangkrutan model Zmijewski memiliki tiga puluh delapan perusahaan yang berpotensi mengalami kebangkrutan. Penelitian ini bermanfaat sebagai bahan referensi mengenai prediksi kebangkrutan.



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INTRODUCTION

Every operating business unit, be it small, medium or large businesses, is always faced with both internal and external risks. One of the risks that can have a major impact on the company is the risk associated with finance. Regardless of the size of a business unit, old or new, a business unit, whether

public or not, has the potential to experience financial distress. This problem can become serious because it is closely related to the business continuity of a business unit. The worst impact of this problem that continues to drag on is the potential for bankruptcy.

Financial statements can be used to measure the risk of bankruptcy of a company. One of the important aspects of the bankruptcy prediction analysis of a company is to see how the company's survival. Bankruptcy generally comes from the company's burden, which is very detrimental to all stakeholders.

According to Kasmir (2019) states that, "Financial reports are reports on the state of the company in a period". Generally used to find out the current and certain periods that are made every three months to once a year. However, the dependence of stakeholders on important information in a business unit, one of which can be analyzed through the financial reports presented, the business unit should be able to facilitate this with financial information according to their needs without having to always stick to routine time.

According to Hery (2016) states that, financial report analysis is a stage for dissecting the elements of financial reports with the aim of better understanding the contents of the report. This means that the analysis of financial reports is intended to facilitate the need for useful information for each stakeholder in the context of making the right and appropriate decisions.

According to Harry I. Wolk et al., (2016) states that, "Signalling theory reveals that when a company has a goal to be able to compete and dominate market share, the company must report its financial statements". Signaling theory explains the reasons that encourage a business to openly inform their financial statements through the stock exchange in the hope of winning business competition and minimizing their funding risk. The business unit displays its reputation through the submission of these financial reports and will have an impact on increasing investor confidence and interest in investing. In line with this, it will ultimately minimize investment risk. Thus, the more the performance of a business unit is of good value, it will be in line with the confidence of the business unit to convey this information to the public (Harsana et al., 2020).

Bankruptcy analysis helps companies anticipate reducing risks that may occur in the future. Improvements are needed if the

characteristics of bankruptcy are known early. Stakeholders also really hope that there will be no bankruptcy for the company. According to (Syilviana, 2016) states that, bankruptcy is insufficient company funds to pay off its obligations, causing company losses.

The Altman Z-Score model is a statistical technique by observing and grouping based on certain characters. The advantage of using this technique is that it can reduce the scope of the analysis into several independent variables. The standard according to this model is that a business unit is declared potentially bankrupt when the calculation results display a Z value below 1.23. The safe zone from bankruptcy of a business unit through this model is when the calculation results display a Z value above 2.9. When it is between these numbers it is referred to as a gray zone or it cannot be stated with certainty whether it is potentially bankrupt or not.

The Springate model is carried out by selecting four financial ratios out of 19 ratios that can predict bankruptcy in the company. The standard for measuring bankruptcy criteria according to this model is that a business unit is declared potentially bankrupt when the calculation results produce an S value below 0.862. A business unit is declared potentially safe from bankruptcy when according to the results of its calculations the S value is above 1.062. Similar to the previous model, there is a gray zone when the S number resulting from the calculation is between these values.

In this model, to obtain a measure of bankruptcy, the proportion of the sample and population must be determined at the outset. The criterion for potential bankruptcy with this model is to pay attention to the value of X which is above or below the number 0. A business unit is declared safe from the bankruptcy zone when the calculation results show the number X above 0. Conversely, when the resulting X number is below 0, a business unit can be declared potentially bankrupt.

Table 1. Comprehensive Profit Data for Retail Companies for 2020-2021 (In Thousands of Rupiah)

NO	CODE	2020	2021
1	ACES	731.310.571	718.802.339
2	CENT	(509.181.000)	(314.231.000)
3	CSAP	60.817.945	225.314.512
4	DAYA	(48.816.999)	(51.708.764)
5	MPPA	(405.307.000)	(337.548.000)
6	LPPF	(873.181.000)	(912.854.000)
7	TRIO	(276.596.537)	(154.647.642)
8	ECII	(20.502.166)	8.707.297
9	HERO	1.214.602.000	(963.526.000)
10	KIOS	(41.857.334)	(2.463.885)

Table 1 shows that there are ten retail companies that experience instability in profits, namely PT. Electronic City Indonesia Tbk, PT. Hero Supermarket Tbk, PT. Matahari Department Store Tbk, PT. Centratama Telekomunikasi Indonesia Tbk, PT. Duta Intidaya Tbk, PT. Catur Sentosa Adiprana Tbk, PT. Matahari Putra Prima Tbk, PT. Ace Hardware Indonesia Tbk, PT. Trikonsel Tbk, and PT. Kioson Commercial Indonesia Tbk. Based on these data, it shows that there are indications that retail companies will go bankrupt, one of which is due to a decrease in sales. Bankruptcy also indicates that the company failed to carry out its operations.

METHODS

This research, which will utilize retail business units registered on the Indonesian Stock Exchange for the 2017-2021 observation period, will attempt to conduct a descriptive analysis that is comparative in nature between the 3 methods of determining potential bankruptcy. The initial step of the research is to collect the necessary data and information through the financial reports of each business unit as a sample. Next is to measure and analyze the data obtained in accordance with the methods and criteria of the 3 models that determine the potential for bankruptcy of a business unit. Based on the comparative results (Masitah & Juniar, 2018) the resulting research will then produce

conclusions and suggestions that can be useful for interested parties.

Research using quantitative. Data analysis is a quantitative descriptive method. The population is 27 retail companies on the Indonesia Stock Exchange in 2017-2021, while 24 companies were selected as samples based on a purposive sampling technique. The study uses research methodology references from Sugiyono (2015).

RESULTS AND DISCUSSION

Results of Retail Company Bankruptcy Analysis Model Altman Z-Score

The results of bankruptcy analysis with this model utilize financial ratios totaling four ratios as variables. The results are then measured and classified based on the criteria that apply to this method. If less than 1.123, the value indicates a potential bankruptcy. However, if it is more than this number, then the opposite applies or there is no potential for bankruptcy. The score is obtained through the formula: $Z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.988x_5$. The average WCTA financial ratio is -0.7845 and the average RETA financial ratio is -0.1906 while the average EBITTA value is -0.1471, then MVEBVE is 4.2937. The STA financial ratio is 1.48328. Overall retail companies in Indonesia have an Altman Z-Score of 1.4011.

Calculation results of the Altman model where as many as twenty companies during the 2017-2021 period have the potential to experience bankruptcy with issuer codes namely CENT in 2017-2021, CSAP in 2017-2021, DAYA in 2017-2021, ECII in 2017-2021, GLOB in 2017-2021, GOLD in 2017, 2018, 2020 and 2021, HERO in 2017-2021, KIOSKS in 2017-2020, KOIN in 2017-2019, LPPF in 2017-2020, MAPI in 2017-2021, MCAS in 2017-2019, MIDI in 2017-2020, MK NT in 2017-2019, MPPA in 2017-2021, RALS in 2017-2020, RANC in 2017-2021, SONA in 2017-2021, TELE in 2019, 2020 and 2021, and TRIO in 2017-2021.

The results according to this model as a whole refer to and support the results of research that has been stated previously from (Eko Nur Huda et al., 2019) which both show the ability of this method to predict

bankruptcy. The results obtained from this study indicate that four companies, namely AMRT, CSAP, MIDI and MPPA companies, are experiencing financial distress in retail companies. So that H1 is accepted. When compared between the average total debt and average equity, the average equity is greater than the average total debt, but the company is said to be bankrupt. The conditions found in general do not support what is stated in the pecking order theory. This theory describes the tendency of a business unit to borrow less money from external parties when the business unit is in a profitable condition because their funding conditions are sufficient to be funded by internal parties. Conversely, when a business unit is based on a lack of profit, it can result in a lack of internal funding, which results in the need for additional funds that must be obtained from external parties or by borrowing.

The results of the Springate Model Retail Company Bankruptcy Analysis

The retail business unit bankruptcy potential in this study is then measured by the Springate model. This model also utilizes four financial ratios, which in turn determine the potential for bankruptcy based on the criteria according to the score obtained. Bankruptcy potential is indicated by a criterion score of less than 0.862. Conversely, a score that exceeds 0.862 indicates a low potential for bankruptcy for a business unit. To get the score obtained through the formula: $S = 1.03x1 + 3.07x2 + 0.66x3 + 0.4x4$. The average value resulting from the WCTA ratio is -0.7845, NPBTTA with a ratio value of -0.1471 and NPBTCL which produces a value of 0.1364 and STA which has a ratio value of 1.4833. Overall retail companies in Indonesia have a Springate value of 0.9285.

The results of the calculation of the Springate model where as many as twenty companies during the 2017-2021 period have the potential to experience bankruptcy with issuer codes namely CENT in 2017-2021, CSAP in 2017-2021, DAYA in 2017-2021, ECII in 2017-2021, GLOB in 2017-2021, GOLD in 2017, 2 018, 2020 and 2021, HERO in 2017-2021, KIOSKS in 2017-2020, KOIN in 2017-2019, LPPF in 2017-2020,

MAPI in 2017-2021, MCAS in 2017-2019, MIDI in 2017-2020, MK NT in 2017-2019, MPPA in 2017-2021, RALS in 2017-2020, RANC in 2017-2021, SONA in 2017-2021, TELE in 2019, 2020 and 2021, and TRIO in 2017-2021.

Overall, this study supports research (Juniati Mandalurang et al., 2019) which states that there are nine business units including CSAP, MAPI, MIDI, MPPA which, according to this model, have the potential to experience financial distress in retail companies. in retail companies. So that H2 is accepted. When compared between the average total debt and average equity, the average equity is greater than the average total debt, but the company is said to be bankrupt. The findings of the results that have been put forward are contrary to what is described in the pecking order theory. The theory describes that the tendency of a business unit to borrow more money from external parties when the business unit is in unfavorable conditions is due to their inadequate funding conditions if only internally funded. Conversely, when a business unit that is based on good or increasing profits can increase internal funding so that they do not need too much additional funding from external parties or by going into debt.

Zmijewski Retail Company Bankruptcy Analysis Results

The last model that was tested and analyzed in this study was the Zmijewski model. The analysis carried out on retail business unit objects using this method utilizes three ratios of financial ratios as measuring variables. The three variables are suspended using the formula: $X = -4.3 - 4.5x1 + 5.7x2 + 0.004x3$. Through the resulting score, the criteria for a business potential that has gone bankrupt are determined according to the provisions of this model. If the score is below zero, then the score indicates minimal bankruptcy potential. Conversely, the potential for bankruptcy will be shown when the score is above zero. The average value of the ROA variable is -0.19063 indicating that ROA must be increased. Leverage with an average ratio of 2.4156 and liquidity with an average ratio of

2.2069. Viewed Overall retail companies in Indonesia have a Zmijewski value of -0.9861.

Based on potential bankruptcy according to this model, the potential for bankruptcy of retail business units in 2017-2021 is a total of twenty one business units which include business units with issuer codes namely ACES in 2019, AMRT in 2019, CENT in 2019, CSAP in 2019, DAYA in 2019-2021, DIVA in 2017 and 2019, ERAA in 2019, GLOB in 2020 and 2021, HERO in 2019-2021, KIOSKS in 2019 and 2020, KOIN in 2019-2021, LPPF in 2019-2021, MAPI in 2019, MCAS in 2019, MKNT in 2019-2021, RALS in 2019, RANC in 2019, SONA in 2019, TELE in 2019-2021, TRIO in 2020 and 2021.

Overall, this study supports research (Nurnovi Trianti & Puji Muniarty, 2021) which states that the prediction results using the Zmijewski model predict that there is only one business unit that has the potential to go bankrupt, namely PT. Smartfren Telekom Tbk. So that H3 is accepted. When compared between the average total debt and average equity, the average equity is greater than the average total debt, but the company is said to be bankrupt. The conditions found in general do not support what is stated in the pecking order theory. This theory describes the tendency of a business unit to borrow less money from external parties when the business unit is in a profitable condition because their funding conditions are sufficient to be funded by internal parties. Conversely, when a business unit is based on a lack of profit, it can result in a lack of internal funding, which results in the need for additional funds that must be obtained from external parties or by borrowing.

Comparison of Bankruptcy Analysis Results

Based on the results of the three bankruptcy analyzes, it shows that the Zmijewski model shows the most bankrupt companies, namely 21 companies, but in terms of the amount of data, it is the Springate model with a total of 86 data, even though there are only 20 companies. Based on the results of the analysis calculations, it can be concluded that all variables are important, because they have their respective levels of accuracy. However, the

highest level of accuracy is the Altman Z-Score model. This is based on the advantages possessed by this model in terms of application which is quite easy for business units in order to assess and analyze the performance of their business units as well as the accuracy of measurement and the ability to predict the performance of a business unit which can reach 95 percent.

Based on this data, 2019 was the highest number for bankruptcy from both Altman, Springate and Zmijewski. The strong condition behind this was the external factor which became a phenomenon at that time, namely the COVID 19 pandemic which was being experienced by almost the entire world, including Indonesia. The pandemic condition certainly has a strong impact on the stability of a business unit, including retail businesses, which rely heavily on sales as their main business activity. Furthermore, in 2020-2021 the conditions of the retail industry will begin to improve so that the figures for bankruptcy are from Altman, Springate and Zmijewski. Then, in 2017-2018, it was a transitional period in consumer behavior which required adaptation of business units in order to remain competitive, namely a change in buying and selling style. At present, Indonesian technology is increasingly sophisticated where consumers can now transact electronically by utilizing digital media (E-Commerce). Therefore a company is unable to overcome its competition.

CONCLUSION

Based on the results of the research that has been analyzed, the Altman Z-Score model has sixty potentially bankrupt companies, the Springate model eighty six companies that have the potential to go bankrupt and the Zmijewski model has thirty eight companies that have the potential to go bankrupt. Based on the comparative model, risk management is important in managing a company (Jikrillah et al., 2022; Juniar et al., 2023). Good corporate governance will be aligned with the agency costs incurred by the company (Sofyaun et al., 2022; Sofyaun et al., 2022; Sofyaun et al., 2022). The results of this study provide suggestions in the form that

management can study bankruptcy analysis to reduce this risk. Companies should consider efficiency against risk (Juniar et al., 2021). In addition, further researchers can increase the number of samples and add to the potential bankruptcy model.

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