

**THE DIFFERENCE BETWEEN THE ALTMAN Z-SCORE AND SPRINGATE
MODELS IN ANALYZING THE BUSINESS SUSTAINABILITY OF
PT. SRI REJEKI ISMAN TBK**

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ABSTRACT

The purpose of this study was to determine the difference between altman z-score and springate in predicting going concern and find out which model has the highest level of accuracy between the altman z-score and springate models at PT Sri Rejeki Isman Tbk. The type of data used by researchers in this study is the type of quantitative and qualitative. Data collection technique is with documentation. The data analysis techniques used are quantitative descriptive methods and inductive methods. The results of the calculation of the original altman z-score method from the 2019-2023 period show that PT Sri Rejeki Isman Tbk is in a state prone to bankruptcy in 2019 - 2020 and experienced bankruptcy in 2021 and then in 2022 - 2023 again in a state prone to bankruptcy. The result of the altman z-score and zmijewski models calculations from the period 2019 - 2023 show that PT Sri Rejeki Isman Tbk has a slight difference in the calculation results and interpretation where the altman z-score model shows that PT Sri Rejeki Isman Tbk is in a position prone to bankruptcy in 2019 – 2020 then in 2021 experienced bankruptcy and returned to bankruptcy prone in 2022-2023. Meanwhile, by using the Zmijewski model throughout the years 2019 - 2023, PT Sri Rejeki Isman Tbk is in an unhealthy state and has experienced bankruptcy

Keywords: Differences between Altman's and Zmijewski's Model, Going Concern Analysis, PT. Sri Rejeki Isman Tbk

ABSTRAK

Tujuan dari penelitian ini adalah untuk mengetahui perbedaan antara altman z-score dan springate dalam memprediksi kelangsungan bisnis dan mengetahui model mana yang memiliki tingkat akurasi tertinggi antara altman z-score dan model springate di PT Sri Rejeki Isman Tbk. Jenis data yang digunakan oleh peneliti dalam penelitian ini adalah tipe data kuantitatif dan kualitatif. Teknik pengumpulan data adalah dengan dokumentasi. Teknik analisis data yang digunakan adalah metode deskriptif kuantitatif dan metode induktif. Hasil perhitungan model altman z-score dan zmijewski periode 2019 – 2023 menunjukkan bahwa PT Sri Rejeki Isman Tbk memiliki sedikit perbedaan hasil perhitungan dan interpretasi dimana dengan model altman z-score menunjukkan bahwa PT Sri Rejeki Isman Tbk berada dalam posisi rawan pailit pada tahun 2019 – 2020 dan kemudian pada tahun 2021 mengalami kebangkrutan dan kembali pailit pada tahun 2022 – 2023. Sementara itu, menggunakan model Zmijewski sepanjang 2019 – 2023, PT Sri Rejeki Isman Tbk dalam keadaan tidak sehat dan mengalami kebangkrutan

Kata Kunci: Perbedaan Model Altman dan Zmijewski, Analisis Keberlanjutan Bisnis, PT. Sri Rejeki Isman Tbk

I. INTRODUCTION

The case of suspension or suspension of stock trading on the Indonesia Stock Exchange is the best action taken by Bapepam (Capital Market Supervisory Agency) in an effort to save investors or capital market participants from causing greater losses. Suspension is carried out to issuers whose shares are listed on the Indonesia Stock Exchange in general because the company does not submit financial statements to the Indonesia Stock Exchange. In 2022, there was a suspension of one of the issuers listed on the Indonesia Stock Exchange. The issuer in question is PT. Sri Rejeki Isman, Tbk. This company used to be a company that was established for more than 50 years and was quite successful by controlling the market share of fabric production in Indonesia which was successful because of its excellent product quality. However, in 2022 this company experienced a downturn and had to be suspended from stock trading on the Indonesia Stock Exchange.

From various sources of information, it is stated that PT Sri Rejeki Isman, Tbk is experiencing financial distress (financial difficulties) due to the amount of debt which reached 1.6 billion US Dollars or around IDR 24.66 trillion at an exchange rate of IDR 15,500,-/USD in 2022. The debt in question is dominated by debts that have interest such as bank debt and bond debt. Meanwhile, the amount of assets owned by the company in the same year was only 1.4 billion USD or in other words, this company experienced a capital deficit. With this data, it can be said that PT. Sri Rejeki Isman Tbk is experiencing financial difficulties. Basically, the company's goal is to make a profit, increase sales, maximize the value of shares, and improve the welfare of shareholders. The success of the company in achieving the goals in general can be seen from the financial statements. From this financial report, it can be seen whether the company is in good health or not. Companies that are not healthy, or that are experiencing financial difficulties, or even those that are experiencing business continuity can be seen from the financial statements presented.

The following data on asset and equity growth at PT Sri Rejeki Isman Tbk for the 2019-2023 period can be seen in the table below:

Table 1
Data on Asset and Equity Development of PT Sri Rejeki Isman Tbk for the Period 2019 - 2023
 (US Dollars)

Period	Total Assets	Equity
2019	1.559.251.755	592.668.709
2020	1.851.988.840	672.417.089
2021	1.233.819.635	(389.449.277)
2022	764.552.039	(781.018.569)
2023	653.512.865	(954.825.475)

From table 1 above, it shows that the development of assets and equity at PT Sri Rejeki Isman Tbk for the period 2019 - 2023 has decreased from year to year. One of the circumstances or risks that must be faced by business people is business continuity. Bankruptcy occurs when a company does not have the necessary funds to run its business and is unable to pay the debts generated from the business. According to (Winaya, 2020) The financial difficulties experienced by the company are an early symptom of bankruptcy. According to (Aminian et al., 2016) The Business Continuity Prediction Model is one of the techniques and tools for predicting the future status of a company, which estimates the likelihood of business continuity. This study uses the altman z-score (modulation) and springate models because these models are quite high, relatively easy and widely used.

Several studies have concluded the accuracy of different business continuity models. Based on research (Efendi, 2018), the most accurate method used in determining business continuity prediction is the springate model, according to (Mamonto, 2022), there is a difference in the results of business continuity prediction with the altman Z-Score model and the springate model. According to (Pangkey, Saerang & Maramis, 2018), model altman (Z-Score) which is more consistently accurate compared to the Zmijewski method (X-Score). According (Melissa, 2020), The Springate model is a business

continuity prediction model that has the highest level of accuracy. The existence of the above difference of opinion makes researchers want to find out the analysis of business and financial sustainability in textile companies listed on the Indonesia Stock Exchange.

II. THEORETICAL STUDIES

Business Continuity

Business continuity (*going concern*) is a situation where the company can continue to operate for an indefinite period of time in the future. According to (Widayanto et al., 2020) that business continuity (*going concern*) is the ability of a company to be able to maintain the survival of its business. With the concept of going concern, a company is expected or assumed to be able to maintain its business continuity for an indefinite or forever period if the company continues to make profits. However, the company may not continue if the owner intends to liquidate the business or cease operations.

Business continuity can be affected by financial and non-financial conditions. Good financial factors or in the sense that the company is still able to make a profit, of course it is expected to continue to maintain its business. However, on the other hand, if the company continues to suffer losses, it will certainly become a burden on the company or the owner or even until it acquires negative equity or in the sense that the accumulated losses are still greater than the invested capital. Another factor is that non-financial can affect the sustainability of the company even though the company suffers losses, for example due to state interests, or political interests, and so on. This often happens in companies owned by the government where the products produced by this company are still needed by many people so there are times when they have to be subsidized by the government for the sustainability of their business.

The cessation of company operations generally occurs due to the company's failure to earn profits. Failure to maintain going concern can occur due to poor management, fraud within the company, changes in macroeconomic conditions such as a decline in the currency exchange rate and a sharp increase in inflation, and so on

Business Continuity Prediction

Business continuity is a condition when a company has sufficient funds to run and develop its business. Business continuity is always related to the adequacy of funds collected from the company's business results. If the funds in the company are no longer sufficient because the company continues to suffer losses, then this company can be said to have experienced financial difficulties. Business difficulties are a recurring condition ranging from minor financial problems, such as liquidity, to more serious problems, such as insolvency, where debts outweigh assets. In this kind of situation, the company is almost certainly considered bankrupt. Other definitions of business continuity are stated by Weston and Copeland that business continuity is a failure that occurs in the company can be distinguished as follows:

1. Economic Failure (*Economic Distressed*)

Failure in the economic sense that the company's income is no longer able to cover its costs, which means that at the level of profit it is less than its capital costs. A related definition is that the present value of the company's cash flow is less than its liabilities

2. Financial Failure (*Financial Distressed*)

Insolvency has two forms, namely technical default that occurs when a company fails to meet one or more of the conditions in its debt provisions, such as the ratio of current assets to current debt that is set, and financial failure or technical insolvency that occurs when the company is unable to fulfill its obligations at a predetermined time even though its total assets exceed its debt

Under certain conditions, the company may experience financial problems. If small financial problems are not handled properly, these financial problems can develop into larger problems and lead to business continuity. There are two causes of company failure: economic and financial, ranging from lack of capital to lack of managerial experience

Before a company is finally declared bankrupt, it is usually characterized by various situations or circumstances, especially related to the effectiveness and efficiency of its operations. Indicators that managers should pay attention to, as pointed out by (Harnanto, 2000) in research Nurul (2011) that:

- a) Decrease in sales volume due to consumer taste or demand.
- b) Increase in production costs.
- c) The level of competition is getting tighter.
- d) Failure to expand.
- e) Ineffectiveness in carrying out the receivables collection function.
- f) Lack of banking support or facilities (credit).
- g) High level of dependence on receivables.

A company that relies on debt in dealing with its operating activities and operating activities, will be in a critical situation, because if one day the company experiences a decline in operating results, the company will have difficulties in completing its obligations

In addition, indicators that can be observed by external parties include:

- a. Dividend reduction to shareholders.
- b. The occurrence of a continuous decline in profits, even to the occurrence of.
- c. Closure or sale of one or more business units.
- d. The occurrence of employee dismissal.
- e. Resignation of top executives.
1. Stock prices that fall continuously in the capital market

Analysis of the Altman Z-Score Method

Studies have been conducted to determine how effective financial ratio analysis is in predicting business continuity or business failure. One of the studies on this prediction is the Multiple Discriminant Analysis, conducted by Edward I. Altman. The purpose of this study is to find similarities in financial ratios used to predict business continuity in each country of study. Altman's Z-Score analysis to predict business continuity is a multivariate formula used to measure a company's financial health. The value of a number of ratios is calculated and then incorporated into the discrimination equation to forecast the level of business continuity of the company. The degree of probability that a company will go bankrupt is indicated by this score, which results from a standard calculation.

Here are 5 financial ratios used to analyze business sustainability predictions using the Altman Z - Score model:

1. Working Capital to Total Assets

It is a ratio that shows how well a business is using all of its assets to generate net working capital. This ratio is obtained by dividing net working capital by total assets. Once current assets are subtracted by current liabilities, a net working model emerges. According to (Kakauhe, 2017), The company will have no difficulty paying off its obligations if its net working capital yield is above 0 (zero). On the other hand, if the net working capital yield is below 0 (zero), The company is indicated to be unable to meet its obligations, especially short-term obligations

2. Retained Earning to Total Assets

A ratio that shows the strength of the company and measures the cumulative profit over the age or length of the company's existence (Kakauhe, 2017). This ratio shows how likely it is that a company can generate retained earnings by using all the assets it owns. The current year's profit announced and given to shareholders is called retained earnings

3. Earning Before Interest And Taxes to Total Assets

It is a ratio that shows how well a company can generate profit from its assets before interest and tax payments.

4. Market Value of Equity to Book Value of Debt

It is a ratio that shows how hard the effort is to fulfill its responsibilities from the value of its own capital market or common stock (Kakauhe, 2017). To find out the market value of your own equity,

you can multiply the number of shares of common stock outstanding by the market price per share of common stock. The book value of debt is the total short- and long-term debt.

5. Sales To Total Assets

This ratio shows how management can use all of the company's assets to increase sales and increase annual profits.

One way to measure business continuity performance is to use the Altman model, which has evolved over time. Altman has expanded the testing and discovery of his model to include nonpublic manufacturing companies as well as corporate bonds. The following are the developments of the altman model, including:

1. Model Altman Z-Score Pertama (Original)

After conducting research on the variables and samples selected, Altman produced the first business continuity model. Altman found 5 (five) types of financial ratios that can be combined to see the difference between bankrupt and non-bankrupt companies. Altman Z-Score is determined by the following formula:

$$Z = 1,2 (X_1) + 1,4 (X_2) + 3,3 (X_3) + 0,6 (X_4) + 1 (X_5)$$

The "cut off" value for this index is:

- Z < 1,81 : Bankrupt
1,81 < Z < 2,99 : Grey area or grey area
Z > 2,99 : Healthy/not bankrupt

Information:

1. Working Capital to total assets (X₁)
 2. Retained earning to total assets (X₂)
 3. Earning Before Interest And Taxes To Total Assets (X₃)
 4. Market Value Of Equity To Book Value Of Debt (X₄)
 5. Sales To Total Assets (X₅)
- Z = Overall Index

2. Model Altman Z-Score Revisi

Since many companies that do not go public have no market value, Altman developed an alternative model to allow this business continuity prediction model to be used for companies in the private sector as well. Therefore, Altman changed the variable X₄ into a comparison of the value of the capital market itself with the value of b.

Given that not all companies do not go public and do not have market value, the formula for companies that do not go public is changed to the following:

$$Z = 0,717 (X_1) + 0,878 (X_2) + 2,107 (X_3) + 0,420 (X_4) + 0,998 (X_5)$$

The cut off values used are:

- Z > 1,23 : Bankrupt
1,20 < Z < 2,9 : Grey area (grey area)
Z > 2,9 : Not bankrupt

Information:

1. Working Capital to total assets (X₁)
 2. Retained earning to total assets (X₂)
 3. Earning Before Interest And Taxes To Total Assets (X₃)
 4. Book Value of Equity To Book Value Of Debt (X₄)
 5. Sales To Total Assets (X₅)
- Z = Overall index

3. Model Altman Z-Score Modifikasi

According to Supardi, various types of companies must adjust to the times. The model created by Altman can then be applied to all types of manufacturing, non-manufacturing, and bond issuing businesses in emerging markets. In contrast to the original and revised Altman Z - Score model, the modified model eliminates the X_5 variable (sales/total assets) in the modified Altman Z - Score analysis. This is because these ratios are very different in industries with different asset sizes. Thus, Altman's modified z-score equation formula does not show the following discriminatory functions:

$$Z = 6,56 (X_1) + 3,26 (X_2) + 6,72 (X_3) + 1,05 (X_4)$$

The *cut off* values used are:

$Z < 1,1$: Bankrupt
$1,1 < z < 2,6$: <i>Grey area</i> (grey area)
$Z > 2,6$: Not bankrupt

Information:

1. Net Working Capital To Total Asset (X_1)
2. Retained Earning To Total Asset (X_2)
3. Earning Before And Tax To Total Asset (X_3)
4. Total equity to total debt ratio (X_4)

Springate Model Analysis

The springate model is a business continuity prediction model developed by (Springate, 1978). The springate *model* in predicting business continuity uses 4 financial ratios, namely:

1. Working Capital to Total Assets

The company's performance can be determined by dividing the net working capital by all assets contained in the company. Net working capital is the difference between total current assets and total current liabilities.

1. Net Profit Before Interest And Taxes to Total Assets

It is a ratio used to determine a company's ability to make a profit.

2. Net Profit Before Interest And Taxes to Total Assets

This is the ratio used to determine how well a business can pay off its short-term debt. Calculation of profit before interest against current liabilities so that management can find out the amount of profit after interest that is sufficient to pay off the company's short-term debts.

3. Sales to Total Asset

The company's ability to make a profit using all of its assets will be demonstrated by dividing sales by total assets.

This model has the following formula:

$$Z = 1,03 A + 3,07 B + 0,66 C + 0,4 D$$

Information:

- A: Working Capital/Total Asset
B: Net Profit Before Interest And Taxes/Total Asset
C: Net Profit Before Taxes/Curret Liabilities
D: Sales/Total Asset

This springate model classifies companies with a Z score of > 0.862 as companies that do not have the potential to go bankrupt, and vice versa if a company with a Z score of < 0.862 is classified as an unhealthy company and has the potential to go bankrupt

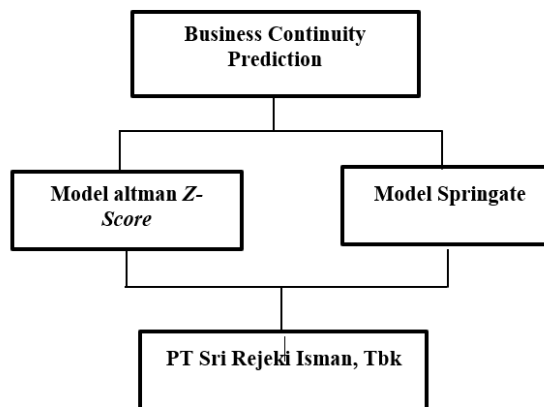


Figure 1. Framework of Thought

III. RESEARCH METHODS

The type of data used by the researcher in this study is the type of data max method (quantitative and qualitative data). Quantitative data is statistical data in the form of numbers, both directly excavated from research results and qualitative data processing results into quantitative data. The population used in this study is PT Sri Rejeki Isman Tbk which has been listed on the Indonesia Stock Exchange (IDX) for the period 2019 – 2023. The sample used in this study is PT Sri Rejeki Isman Tbk which has been listed on the Indonesia Stock Exchange (IDX) for the 2019 – 2023 period.

The analysis techniques that will be used to determine the level of accuracy of the two Altman Z-Score and Springate business continuity prediction method models are:

1. Calculations were carried out using the Altman Z-Score and Springate formulas.
2. The results obtained are moved to the standard deviation so that more significant differences can be seen.
3. Conclusion If the results are in accordance with the circumstances that occurred, this method is declared accurate.

IV. RESULTS AND DISCUSSION

Calculation of Business Sustainability Prediction Analysis with Altman Z Model - Score (Original) at PT Sri Rejeki Isman Tbk for the period 2019 – 2023

To determine the z-value and categorize the value into predetermined groups, what is done is to calculate the financial ratios in the original Altman Z-Score model. The following is the calculation and analysis of the ratio of the five variables based on the published financial statements of PT Sri Rejeki Isman Tbk for the 2019-2023 period in United States Dollars.

1. Working Capital To Total Assets (X_1)

$$\text{Rasio } X_1 = \frac{\text{Working Capital}}{\text{Total Assets}}$$

Working Capital = (Current Asset - Current liabilities)

Table 2
Calculation of Working Capital (Current Assets - Current Liabilities)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period
(US Dollars)

Year	Current Asset	Current Liabilities	Current asset-Current Liabilities
2019	894.760.661	182.540.923	712.219.738

2020	1.151.048.437	398.345.886	752.702.551
2021	589.321.220	1.578.580.872	-989.259.652
2022	273.097.960	99.697.450	173.400.510
2023	186.066.333	106.417.558	79.648.775

Table 3
Calculation of the X₁ (Net Working Capital To Total Assets) Ratio
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period
(US Dollars)

Year	Working Capital	Total Aset	Working Capital/Total Aset
2019	712.219.738	1.559.251.755	0,45
2020	752.702.551	1.851.988.840	0,40
2021	-989.259.652	1.234.193.246	-0,80
2022	173.400.510	764.552.039	0,22
2023	79.648.775	653.512.865	0,12

In 2019, the X₁ ratio was 0.45 which means that every 1.00 total assets were able to generate a net working capital of 0.45. The value of the ratio is the result of the distribution between net working capital of 712,219,738 and total assets of 1,559,251,755. In 2020, the ratio of net working capital to total assets showed an X₁ ratio of 0.40 which means that every 1.00 total assets was able to generate net working capital of 0.40. This year, the liquidity ratio decreased from the previous year from 0.45 to 0.40. The value of the ratio is the result of the division between net working capital of 752,702,551 and total assets of 1,851,988,840.

In 2021, the ratio of net working capital to total assets shows a ratio of X₁ -0.80 which means that every 1.00 total assets are able to generate net working capital of -0.80. This year, the X₁ ratio has decreased from the previous year. The rate of decline that occurred was 0.4%. In 2022, the ratio of net working capital to total assets shows an X₁ ratio of 0.22 which means that every 1.00 total assets are able to generate net working capital of 0.22. This year, the X₁ ratio has increased by 1.02% from 2021. In 2023, the ratio of net working capital to total assets shows X₁ 0.12 which means that every 1.00 total assets are able to generate net working capital of 0.12. This year, the X₁ ratio decreased by 0.1% from 2022.

Retained Earning To Total Assets (X₂)

$$\text{Rasio } X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

Table 4
Calculation of the X₂ Ratio (Retained Earning To Total Assets)
PT Sri Rejeki Isman Tbk Period 2019 - 2023
(US Dollars)

Year	Retained Earnings	Total Assets	Retained Earnings / Total Assets
2019	397.442.270	1.559.251.755	0,25
2020	479.531.124	1.851.988.840	0,25
2021	591.664.765	1.234.193.246	0,47
2022	987.227.926	764.552.039	1,29
2023	1.102.430.909	653.512.865	1,68

In 2019, the X₂ ratio showed 0.25 which means that every 1.00 total assets owned by PT Sri Rejeki Isman Tbk was able to generate a retained earnings of 0.25. This value is the result of the distribution of retained earnings of 397,442,270 with total assets of 1,559,251,755. In 2020, the ratio of

retained earnings to total assets increased to 0.25, which means that for every 1.00 total assets owned by PT Sri Rejeki Isman Tbk, it was able to generate a retained earnings of only 0.25.

In 2021, the ratio of retained earnings to total assets increased from the previous year by 0.47, which means that every 1.00 total assets owned by PT Sri Rejeki Isman Tbk was able to generate a retained earnings of 0.47. In 2022, the ratio of retained earnings to total assets increased from the previous year of 1.29, which means that every 1.00 total assets owned by PT Sri Rejeki Isman Tbk is able to generate a retained earnings of 1.29. The rate of increase that occurred was 0.81%. In 2023, the ratio of retained earnings to total assets increased by 0.39%, which means that for every 1.00 total assets owned by PT Sri Rejeki Isman Tbk, it is able to generate a retained earnings of only 1.68

Earning Before and Tax To Total Assets (X₃)

$$\text{Rasio } X_3 = \frac{\text{EBIT}}{\text{Total Assets}}$$

Table 5
Calculation of the X₃ Ratio (Earnings Before and Tax To Total Assets)
PT Sri Rejeki Isman Tbk Period 2019 - 2023
(US Dollars)

Year	EBIT	Total Assets	EBIT/Total Assets
2019	182.477.967	1.559.251.755	0,11
2020	175.802.213	1.851.988.840	0,09
2021	-1.065.813.728	1.234.193.246	-0,86
2022	-274.810.951	764.552.039	-0,35
2023	-105.141.388	653.512.865	-0,16

In 2019, the ratio of profit before tax to total assets showed an X₃ ratio of 0.11 which means that every 1.00 total assets can generate a profit before tax of 0.11. The value of the ratio is the result of the division between EBIT of 182,477,967 and total assets of 1,559,251,755. In 2020, the ratio of profit before tax to total assets decreased by 0.02%, which means that every 1.00 total assets can generate a profit before tax of 0.09.

In 2021, the X₃ ratio was -0.86 which means that every 1.00 total assets can generate a profit before tax of -0.86. The rate of decline that occurred was 0.95%. In 2022, the ratio before tax to total assets decreased to -0.35 from 2021 which means that every 1.00 total assets can generate -0.35 profit before tax. In 2023, the X₃ ratio has seen a drastic decline to -0.16 which means that every 1.00 total assets can generate -0.16 profit before tax. The rate of decline that occurred was 0.19%

Market Value of Equity to Book Value of Total Liabilities (X₄)

$$\text{Rasio } X_3 = \frac{\text{Market Value of Equity}}{\text{Book Value of Total Liabilities}}$$

Table 6
Calculation of X₄ (Total Equity to Total Debt Ratio) Ratio
PT Sri Rejeki Isman Tbk for the Period 2019 - 2023
(US Dollars)

Year	Market Value of Equity	Book Value of Total Liabilities	Market Value of Equity/Book Value of Total Liabilities
2019	592.668.709	966.583.046	0,61
2020	672.417.089	1.179.571.751	0,57
2021	398.816.550	1.633.009.796	0,24

2022	781.018.569	1.545.570.608	0,50
2023	895.535.302	1.442.630.609	0,62

In 2019, the ratio of total equity or capital to total debt or liabilities showed an X_4 ratio of 0.61 which means that for every 1.00 total debt can be secured by equity of 0.61. The value of the ratio is the result of the division between total equity or capital of 592,668,709 and total debt or liabilities of 966,583,046. In 2020, the ratio of total equity or capital to total debt or liabilities showed an X_4 ratio of 0.57 which means that every 1.00 total debt can be secured by total equity of 0.57. The ratio of total equity or capital to total debt or liabilities decreased by 0.04% from 2019.

In 2021, the ratio of total equity or capital to total debt or liabilities showed that the X_4 ratio decreased to 0.24 which means that every 1.00 total debt can be secured by total equity of 0.24. In 2022, the X_4 ratio increased again by 0.26%, which is 0.50, which means that every 1.00 total debt can be guaranteed by total equity of 0.50. The value of the ratio is the result of the division between total equity or capital of 781,018,569 and total debt or liabilities of 1,545,570,608.

In 2023, the ratio of total equity or capital to total debt or liabilities shows an X_4 ratio of 0.62 which means that every 1.00 total debt can be secured by total equity of 0.62. The ratio of total equity or capital to total debt or liabilities has increased from the previous year. The rate of increase in the X_4 ratio in 2023 is 0.11%.

Sales to Total Assets (X_5)

$$\text{Rasio } X_5 = \frac{\text{Sales}}{\text{Total Assets}}$$

Table 7
Calculation of X_5 (Sales to Total Assets) Ratio
PT Sri Rejeki Isman Tbk for the Period 2019 - 2023
(US Dollars)

Year	Sales	Total Assets	Sales/Total assets
2019	1.181.834.182	1.559.251.755	0,75
2020	1.282.569.384	1.851.988.840	0,69
2021	847.523.131	1.234.193.246	0,68
2022	524.565.291	764.552.039	0,68
2023	248.507.207	653.512.865	0,38

In 2019, the X_5 ratio showed 0.75 which means that every 1.00 total assets were able to generate a total sales of 0.75. The value of this ratio is the result of the division of total sales of 1,181,834,182 with total assets of 1,559,251,755. In 2020, the ratio of total sales to total assets showed an X_5 ratio of 0.69 which means that every 1.00 total assets were able to generate total sales of 0.69. The ratio of total sales to total assets decreased by 0.06% from 2019.

In 2021, the ratio of total sales to total assets shows an X_5 ratio of 0.68 which means that every 1.00 total assets are able to generate total sales of 0.68. The value of this ratio is the result of the division between total sales of 847,523,131 and total assets of 1,234,193,246. In 2022, the ratio of total sales to total assets shows an X_5 ratio of 0.68 which means that total assets are able to generate total sales of 0.68. In 2023, the ratio of total sales to total assets shows an X_5 ratio of 0.38, which means that total assets are able to generate total sales of 0.38. This ratio has decreased by 0.3% from 2022

Altman Z - Score (Original) Results on PT Sri Rejeki Isman Tbk for the period 2019 - 2023

Based on the data results from the calculation of the five variables used in the altman z-score (original) modal above, the next step is to enter the results into the equation model of the altman z-score

(original) by multiplying the results of the above data with the constant or standard values of each variable. The equation model and the results of the calculation based on the original z-score are:

$$Z_i = 1,2 X_1 + 1,4 X_2 + 3,3 X_3 + 0,6 X_4 + 1,0 X_5$$

Information:

X_1 = Working Capital/ Total Assets

X_2 = Retained Earnings / Total Assets

X_3 = EBIT / Total Assets

X_4 = Market Value of Equity / Book Value of Total Liabilities

X_5 = Sales / Total Assets

Information:

1. $Z_i < 1,8$ = The company is in the bankruptcy category
2. $1,81 < Z_i < 2,99$ = The company is included in the category of *gray area* or bankruptcy-prone area
3. $Z_i > 2,99$ = The company is in the category of not bankrupt

Next, it is to sum the multiplication results of each of the variables above, to find out the results of the analysis of business continuity prediction with the variables above, to find out the results of the analysis of business continuity prediction with the altman z-score model (original), can be seen from the table below.

Table 8
Analysis Results with Altman Z-Score Model (original)
PT Sri Rejeki Isman Tbk for the Period 2019 - 2023

Year	X_1	X_2	X_3	X_4	X_5	Z-Score	Results of Analysis
2019	0,45	0,25	0,11	0,61	0,75	2,41	<i>Grey Area</i>
2020	0,40	0,25	0,09	0,57	0,69	2,19	<i>Grey Area</i>
2021	-0,80	0,47	-0,86	0,24	0,68	-2,30	Bangkrut
2022	0,22	1,29	-0,35	0,50	0,68	1,88	<i>Grey Area</i>
2023	0,12	1,68	-0,16	0,62	0,28	2,72	<i>Grey Area</i>

Based on the table above, the results of the calculation of the original altman z-score model from the 2019 - 2023 period show that PT Sri Rejeki Isman Tbk was prone to bankruptcy in 2019 - 2020 and experienced business continuity in 2021 and then in 2022 - 2023 again in a state prone to bankruptcy. The decline in the z-score in 2021, if examined, is due to the value of current liabilities (current liabilities) which is quite high compared to 2019, 2020, 2022, and 2023, which is 1,578,580,872. Then the altman z-score is the highest in 2023, but it remains in a state of bankruptcy because its z-score is less than 2.99.

Calculation of Business Sustainability Prediction Analysis with Springate at PT Sri Rejeki Isman Tbk for the 2019-2023 period

To determine the value of s and categorize the value into a group that has been determined, what is done is to calculate the financial ratio in the Springate model. The following is the calculation and analysis of the ratio of the four variables based on the published financial statements of PT Sri Rejeki Isman Tbk for the period 2019 - 2023 in United States Dollars

1. Working Capital to Total Assets

$$A = \frac{\text{Working Capital}}{\text{Total Assets}}$$

Working Capital = (Current Asset - Current liabilities)

Table 9
Calculation of Working Capital (Current Assets-Current Liabilities)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period

(US Dollars)

Year	Current Asset	Current Liabilities	Current asset-Current Liabilities
2019	894.760.661	182.540.923	712.219.738
2020	1.151.048.437	398.345.886	752.702.551
2021	589.321.220	1.578.580.872	-989.259.652
2022	273.097.960	99.697.450	173.400.510
2023	186.066.333	106.417.558	79.648.775

Table 10
Calculation of the A Ratio (Working Capital/Total Assets)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period

(US Dollars)

Year	Working Capital	Total Assets	Working Capital/Total Asset
2019	712.219.738	1.559.251.755	0,45
2020	752.702.551	1.851.988.840	0,40
2021	-989.259.652	1.234.193.246	-0,80
2022	173.400.510	764.552.039	0,22
2023	79.648.775	653.512.865	0,12

In 2019, the A ratio was 0.45 which means that every 1.00 total assets were able to generate working capital of 0.45. The value of the ratio is the result of the division between working capital of 712,219,738 and total assets of 1,559,251,755. In 2020, the A ratio is 0.40, which means that for every 1.00 total assets, it is able to generate working capital of only 0.40. This ratio experienced a decrease of 0.05%. In 2021, the ratio of working capital to total assets showed a drastic decrease in the A ratio from the previous year, which was -0.80. Which means that every 1.00 total assets are able to generate working capital of -0.80.

In 2022, the ratio of working capital to total assets shows that the A ratio has increased to 0.22, which means that every 1.00 total assets are able to generate working capital of 0.22. This year, the A ratio has increased by 1.02%. In 2023, the ratio of working capital to total assets shows an A ratio of 0.12, which means that every 1.00 total assets are able to generate working capital of 0.12. This year, the A ratio decreased by 0.1%

2. Net Profit Before Interest and Taxes To Total Assets

$$B = \frac{\text{Net Profit Before Taxes}}{\text{Total Assets}}$$

Table 11
Calculation of the B Ratio (Net Profit Before Taxes/Total Assets)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period

(US Dollars)

Year	Net Profit Before Interest And Taxes	Total Assets	Net Profit Before Taxes/Total Asset
2019	101.548.894	1.559.251.755	0,06
2020	101.700.548	1.851.988.840	0,05
2021	-1.181.388.693	1.234.193.246	-0,95
2022	-296.487.480	764.552.039	-0,38

2023	-116.140.876	653.512.865	-0,17
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In 2019, the B ratio showed 0.06 which means that for every 1.00 total assets owned by PT Sri Rejeki Isman Tbk was able to generate a net profit before tax of 0.06. The value of the ratio is the result of the division between net profit before taxes of 101,548,894 and total assets of 1,559,251,755. In 2020, the ratio of net profit before tax to total assets decreased in the previous year to 0.05, which means that every 1.00 total assets owned are able to generate a net profit before tax of 0.05. The decrease occurred by 0.01%.

In 2021, the B ratio decreased drastically from 2020 to -0.95 which means that every 1.00 total assets are only able to generate a net profit before tax of -0.95. The rate of decline that occurred was 1%. In 2022, the ratio of net profit before tax to total assets decreased again to -0.38 which means that every 1.00 total assets are able to generate a net profit before tax of -0.38. The rate of decline that occurred was -0.57%. In 2023, the B ratio decreased again to -0.17 which means that every 1.00 total assets are able to generate a profit before tax of -0.17. The rate of decline that occurred was -0.21

3. Net Profit Before Interest and Taxes To Current Liabilities

$$C = \frac{\text{Net Profit Before Taxes}}{\text{Current Liabilities}}$$

Table 12
Calculation of the C Ratio (Net Profit Before Taxes/Current Liabilities)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period
(US Dollars)

Year	Net Profit Before Interest And Taxes	Current Liabilities	Net Profit before Taxes /Current Liabilities
2019	101.548.894	182.540.923	0,55
2020	101.700.548	398.345.886	0,25
2021	-1.181.388.693	1.578.580.872	-0,74
2022	-296.487.480	99.697.450	-2,97
2023	-116.140.876	106.417.558	-1,09

In 2019, the C ratio was 0.55 which means that every 1.00 current liabilities were able to generate a net profit before tax of 0.55. The value of the ratio is the result of the division between net profit before tax of 101,548,894 and current liabilities of 182,540,923. In 2020, the ratio of net profit before tax to current liabilities was 0.25, which means that every 1.00 current liabilities were able to generate a net profit before tax of 0.25. This year it has decreased from 2019, which is 0.3%.

In 2021, the ratio of net profit before tax to current liabilities was -0.74, which means that every 1.00 current liabilities were able to generate a net profit before tax of -0.74. This year, the C ratio decreased from the previous year, which was 0.99%. In 2022, the C ratio is -2.97, which means that every 1.00 current liabilities are able to generate a net profit before tax of -2.9. This year, the rate of decline that occurred was -2.23%. In 2023, the ratio of net profit before tax to current liabilities is -1.09, which means that every 1.00 current liabilities are able to generate a net profit before tax of -1.09. The rate of increase that occurred was -1.88%

4. Sales To Total Assets

$$D = \frac{\text{Sales}}{\text{Total Assets}}$$

Table 13
Calculation of the D Ratio (Sales/Total Assets)
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period
(US Dollars)

Year	Sales	Total asset	Sales/Total asset
2019	1.181.834.182	1.559.251.755	0,75
2020	1.282.569.384	1.851.988.840	0,69
2021	847.523.131	1.234.193.246	0,68
2022	524.565.291	764.552.039	0,68
2023	248.507.207	653.512.865	0,38

In 2019, the ratio of sales to total assets was 0.75 which means that every 1.00 total assets were able to generate sales of 0.75. The value of the ratio is the result of the distribution of sales of 1,181,834,182 with total assets of 1,559,251,755. In 2020, the D ratio was 0.69 which means that every 1.00 total assets were able to generate sales of 0.69. This year, the D ratio decreased by 0.6%.

In 2021, the ratio of sales to total assets was 0.68, which means that every 1.00 total assets were able to generate sales of 0.68. This year there was a decrease of 0.01%. In 2022, the ratio of sales to total assets is the same as in 2021, which is 0.68, which means that every 1.00 total assets are able to generate sales of 0.68. In 2023, the D ratio experienced a fairly drastic decrease of 0.3%, which means that every 1.00 total assets are able to generate sales of 0.38

Springate Results at PT Sri Rejeki Isman Tbk for the 2019-2023 period

Based on the data from the calculation of the four variables used in the Springate model above, the next step is to enter the results into the equation model from Springate by multiplying the results of the data above by the constant or standard values of each variable. The equation model and the results of the calculation based on Springate are:

$$S = 1,03 A + 3,07 B + 0,66 C + 0,4 D$$

Information:

A = Working Capital/Total Assets

B = Net Profit Before Interest and Taxes/Total Assets

C = Net Profit Before Taxes/Current Liabilities

D = Sales/Total Assets

Information:

1. $S > 0,862 =$ Not Bankruptcy

2. $S < 0,862 =$ Bankrupt

Next, the multiplication results of each of the variables above, to find out the results of the analysis of business continuity prediction with the springate model, can be seen from the table below

Table 14
Analysis Results with the Springate Model
PT Sri Rejeki Isman Tbk for the 2019 - 2023 Period

Year	A	B	C	D	Springate	Results of Analysis
2019	0,456	0,065	0,556	0,757	1,340	Not Bankruptcy
2020	0,406	0,054	0,255	0,692	1,032	Not Bankruptcy
2021	-0,801	-0,957	-0,748	0,686	-3,983	Bankrupt
2022	0,226	-0,387	-2,973	0,686	-2,645	Bankrupt
2023	0,121	-0,177	-1,091	0,380	-0,988	Bankrupt

Based on the table above, calculations based on the springate model from the 2019 - 2023 period show that PT Sri Rejeki Isman Tbk is in an unhealthy state and experiencing business continuity because the average springate value is below 0.862 or $S < 0.862$ which means that PT Sri Rejeki Isman Tbk is in a state of bankruptcy. If you look back, the bankruptcy of the PT has occurred since 2021, which is - 3,983. This is because the value of the Net Profit Before Taxes to Current Liabilities (C) variable has the lowest ratio or value of -0.748 compared to 2019, 2020, 2022, and 2023 and the Working Capital to Total Assets (A) variable also has the lowest value compared to 2019, 2020, 2022, and 2023 which is - 0.801. So it can be concluded that Net Profit Before Taxes to Current Liabilities and Working Capital to Total Assets have a greater influence in determining the value of springate than other variables and the rise and fall of profit can affect the value of springate or the continuity of a company's business.

Table 15. Assessment of Deviation Standards for Business Continuity Prediction Models

Year	Altman Z-Score	Springate
2019	2,417015404	1,340755032
2020	2,198037624	1,032726097
2021	-2,307250483	-3,983495198
2022	1,883061013	-2,645231037
2023	2,729754022	-0,988257835
Standard Deviation	2,086577575	2,302575591

In table 15, the results of the altman z-score model are obtained as the model with the lowest standard deviation result of 2.086577575 compared to the springate model with a standard deviation of 2.302575591 stating that the altman z-score model is the model with the least accuracy in predicting business continuity compared to the springate model which is the comparison. For this reason, it can be concluded that the springate model is more accurate in PT Sri Rejeki Isman Tbk than the altman z-score model

V. CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the research and discussion on business continuity prediction research using the altman z-score and springate models at PT Sri Rejeki Isman Tbk for the period 2019 – 2023, it can be concluded that PT Sri Rejeki Isman Tbk with the altman z-score model shows that PT Sri Rejeki Isman Tbk was in a gray area (prone to bankruptcy) in 2019 – 2020 and then in 2021 experienced financial difficulties and returned to the gray area (prone to bankruptcy) in 2022 – 2023. Meanwhile, the results of research on PT Sri Rejeki Isman Tbk in 2019 – 2023 using the springate model show that PT Sri Rejeki Isman Tbk does not experience financial difficulties or stable company conditions because its springate value from 2019 – 2020 is above 0.862 or $S > 0.862$. Then in the following year, namely 2021 – 2023, PT Sri Rejeki Isman Tbk experienced financial difficulties. This can be seen from the springate value below 0.862 or $S < 0.862$. Therefore, from the above statement, it can be concluded that these two methods provide different results where the altman z-score model shows that PT Sri Rejeki Isman Tbk was in a state of gray area (prone to bankruptcy) in 2019 – 2020 and then in 2021 experienced business continuity and returned to the gray area (prone to bankruptcy) in 2022 – 2023 while the zmijewski model gave results that throughout 2019 – 2020 PT Sri Rejeki Isman Tbk did not experience difficulties However, in 2021 – 2023 it experienced financial difficulties.

Suggestion

From the conclusion above, the suggestion that the author can give is that the next researcher uses other prediction models such as the Grover, Ohlson, Zagvren, Fulmer, and other models to be able to compare the business continuity predictions of PT Sri Rejeki Isman Tbk, which model is the most appropriate to predict the company's business continuity and compare it with the reality after 2023 whether PT Sri Rejeki Isman Tbk really experiences financial difficulties or not

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