

Research Article

## Analysis of Bankruptcy Prediction in State-Owned Enterprises in the Pharmaceuticals Sector

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**Abstract:** Operational performance of two state-owned pharmaceutical companies has been in the public spotlight in recent years. Poor financial conditions have caused both companies to experience net losses for years. The risk of bankruptcy becomes a serious threat if the fundamental problems of these two state-owned pharmaceutical companies are not successfully addressed. This study was conducted to determine whether PT. Kimia Farma Tbk and PT. Indofarma Tbk are likely to go bankrupt between 2021-2024 and to analyze the factors that could lead to bankruptcy. This study used a descriptive quantitative approach. Data were analyzed using Springate, Grover, and Zmijewski models to detect bankruptcy. Springate model predicted PT. Kimia Farma Tbk would be in the bankruptcy category from 2021-2024. Grover and Zmijewski model analysis showed that PT. Kimia Farma Tbk was in the healthy category from 2021-2022, then entered the bankruptcy category from 2023-2024. The potential for bankruptcy is influenced by poor liquidity, the company's reliance on debt to finance assets, unproductive asset management, and net losses. The condition of PT. Indofarma Tbk is categorized as bankrupt from 2021-2024 based on the Zmijewski and Springate models. The Grover model predicts PT. Indofarma Tbk will be healthy in 2021 and will then go bankrupt in 2022-2024. Indications of bankruptcy are influenced by declining sales and assets, debt exceeding assets, liquidity difficulties, and a continuing trend of losses.

**Keywords:** Bankruptcy; Grover Model; Springate Model; State-Owned Enterprises; Zmijewski Model.

### 1. Introduction

To strengthen the strategic role of state-owned enterprises (BUMN) in enhancing government programs to achieve national goals, the government continues to strive to improve BUMN performance by streamlining the number of BUMN through the establishment of sectoral holding companies, currently numbering 15. The establishment of these BUMN holding companies is expected to assist BUMN in aligning their business models to become more competitive both regionally and globally. Of the 15 holding companies established by sector, one is the pharmaceutical sector BUMN holding company. PT Bio Farma (Persero) serves as the parent company of the pharmaceutical BUMN holding company, with PT Kimia Farma Tbk (KAEF) and PT Indofarma Tbk (INAF) as members. The purpose of establishing the pharmaceutical BUMN holding company is to strengthen the independence of the national pharmaceutical industry and restore the financial condition of the holding company members through improvements in capital structure, asset consolidation, debt, and equity.

However, after PT. Kimia Farma Tbk and PT. Indofarma Tbk merged with PT. Bio Farma in 2020, the two companies faced various serious problems. Various issues that emerged, ranging from legal cases, financial statement manipulation, financial losses, and allegations of corruption, made the state-owned companies the focus of public attention. The financial problems burdening the two companies were triggered by a continuous decline in financial performance from 2021 to 2024. The following is an overview of the financial

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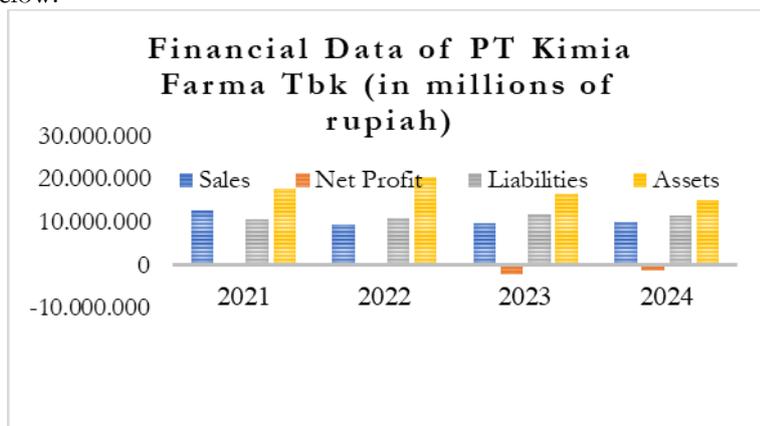
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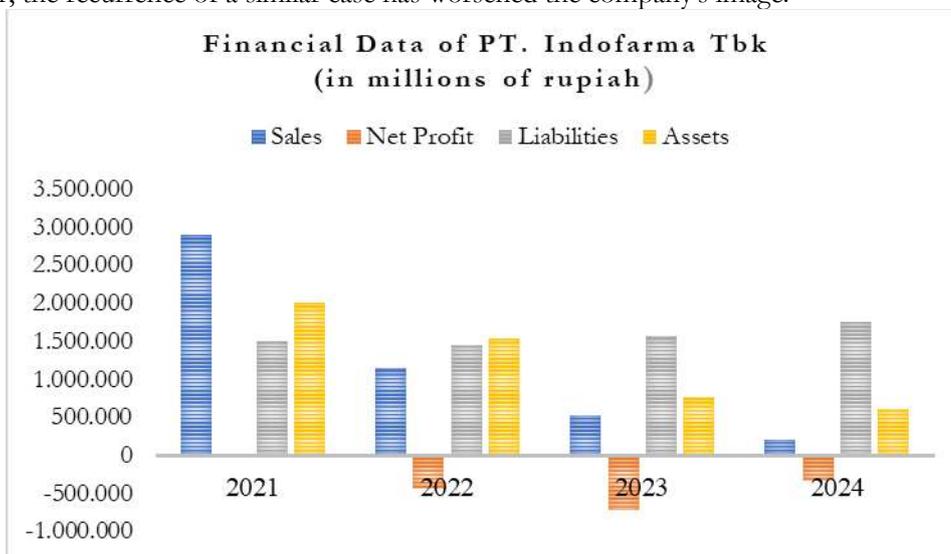
performance of PT. Kimia Farma Tbk and PT. Indofarma Tbk from 2021-2024, as seen in the graph below:



Source: www.idx.co.id (processed data, 2025)

Figure 1. Financial Data of PT. KAEF.

The figure above shows that PT. Kimia Farma Tbk experienced a decline in sales in 2022 but remained relatively stable from 2022 to 2024. In 2021, the company recorded a positive net profit, but reversed to a loss in 2022, followed by a trend of larger losses in 2023, before significantly reducing the losses in 2024. Debt fluctuated from 2021 to 2024, while total assets experienced an upward trend in 2022 but reversed to a decline in value in the last three years. PT. Kimia Farma Tbk's poor financial condition is not solely due to financial factors but also to several other factors, such as financial reporting scandals, alleged fraud, operational inefficiencies, and corporate governance. In 2024, indications of financial statement manipulation at its subsidiary, PT. Kimia Farma Apotek, were revealed, resulting in state losses. Although the company had experienced a case of financial report manipulation in 2001, the recurrence of a similar case has worsened the company's image.



Source: www.idx.co.id (processed data, 2025)

Figure 2. Financial Data of PT. INAF.

Figure 2 above shows that PT. Indofarma Tbk's sales experienced a significant decline from 2021 to 2024. This decline in sales resulted in consecutive losses for the past four years. The largest losses occurred in 2023, then decreased in 2024. The amount of debt experienced an upward trend, while the value of assets actually decreased each year. From 2023 to 2024, the amount of debt was much greater than the value of assets. The cause of PT. Indofarma Tbk's deteriorating financial condition was not only the decline in sales but also allegations of fraud, employee salary arrears, financial report manipulation, and poor management. Furthermore, the 2024 audit findings revealed irregularities in financial management and investments from 2020 to 2023. This case included fictitious online lending transactions that resulted in state losses of IDR 71.8 billion.

If the financial conditions of PT. Kimia Farma Tbk and Indofarma Tbk continue to deteriorate, and remedial measures are not taken immediately, both companies will experience financial difficulties. Poor financial conditions are an early sign of bankruptcy. Companies that are potentially bankrupt will face various problems such as high debt burdens, declining sales, experiencing continuous losses, decreasing assets, and difficulty repaying debt. Financial data from PT. Kimia Farma Tbk and PT. Indofarma Tbk over the past four years indicates that both companies are experiencing financial difficulties. Indications of bankruptcy of a company are characterized by serious financial problems such as a high debt ratio, declining revenue or sales, inability to repay debt, experiencing operating losses in several periods, and declining assets (Rika et al., 2020).

Many studies have been conducted on the financial condition of the pharmaceutical sector using different methods. Research (Mangopo et al., 2025) showed that the financial condition of PT Indofarma Tbk for the 2022-2024 period, based on the Altman Z-Score analysis, indicated severe financial distress and a high risk of bankruptcy. Research (Madewi, 2024) found that PT Indofarma Tbk for the 2020-2022 period was in the phase of bankruptcy based on the Altman Z-Score analysis. Research (Soleha, 2022) found that the financial performance of PT Kimia Farma Tbk for the 2019-2021 period was considered poor based on the analysis of liquidity ratios, solvency ratios, activity ratios, and profitability ratios. Research (Azizah & Lastanti, 2022) shows that the Z-Score calculation results indicate that PT Kalbe Farma Tbk, which was in the healthy category in 2016, was in the gray area in 2017-2018, and ultimately entered the bankruptcy category in 2019-2020. Meanwhile, PT Indofarma Tbk was in the gray area and then entered the bankruptcy category in 2020.

The difficult financial conditions of these two pharmaceutical companies prompted researchers to conduct further research. Therefore, this study aimed to determine whether PT Kimia Farma Tbk and PT Indofarma Tbk had the potential for bankruptcy during the 2021-2024 period, based on the Springate, Grover, and Zmijewski models, and to analyze the factors that could lead to bankruptcy. The research findings are expected to provide various parties with information on the early signs of a company experiencing financial difficulties before it reaches bankruptcy. Furthermore, it will help management understand which financial aspects require special attention to prevent bankruptcy.

## 2. Preliminaries or Related Work or Literature Review

### 2.1. Bankruptcy Prediction

Bankruptcy is the failure of a company to conduct its operations to generate profits. Bankruptcy is a condition in which a company experiences instability in its operations due to its inability to meet its obligations, resulting in decreased profitability. (Abadi & Misidawati, 2023). Bankruptcy prediction aims to identify early signs of financial distress and predict the likelihood of bankruptcy. The bankruptcy process does not occur suddenly but proceeds through several stages, including:

1) Early Stage (Latency)

In the early stages, the company exhibits early signs of financial distress, but these are not visible to outsiders, such as declining profitability, inefficient production, declining product sales, and shrinking company profits.

2) Intermediate Stage (Grey Zone)

At this stage, the company experiences increasingly critical and more obvious financial difficulties, which begin to impact external parties, such as increased operational costs, late payment of obligations, unstable cash flow, numerous customer complaints, and employee departures.

3) Final stage (Distress zone)

This stage is when a company experiences a crisis and is on the verge of bankruptcy, characterized by severe liquidity difficulties, debt exceeding assets, asset decline, inability to repay debts as they fall due, downsizing of operational costs, and the risk of bankruptcy.

### 2.2 The Springate Model

The Springate Model was first developed by Gordon Springate in 1978 to identify the potential for bankruptcy in companies experiencing financial difficulties. To detect potential bankruptcy in a company, the Springate model uses four financial ratios formulated as follows:

$$S\text{-score} = 1.03 A + 3.07 B + 0.66 C + 0.4 D$$

Description:

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

After obtaining the S-score, the company's financial condition is determined using the following criteria:

- a. The company is in the safe zone (no potential for bankruptcy), if the S-score is  $> 0.862$
- b. The company is in the bankruptcy zone, if the S-score is  $> 0.862$

### 2.3 Grover Model

The Grover Model was created by Jeffrey Grover in 2001 to measure a company's bankruptcy risk. This model is a modified version of the Altman Z-Score model, adding several new financial ratios. The formula for the Grover model is:

$$G\text{-Score} = 1.650X_1 + 3.404X_2 + 0.016ROA + 0.057$$

Description:

$X_1$  = Working Capital / Total Assets

$X_2$  = Earnings Before Interest and Taxes / Total Assets

ROA = Net Income / Total Assets

The G-score results are used to determine three company categories:

- a. If the G-score is  $> 0.01$ , the company is predicted to be healthy.
- b. If the G-score is  $-0.02 < G < 0.01$ , the company is predicted to be in the gray area.
- c. If the G-score is  $< -0.02$ , the company is predicted to be at risk of bankruptcy.

### 2.4 Zmijewski Model

This model was developed by Mark Zmijewski in 1984 to predict the potential for corporate bankruptcy using three financial ratios: profitability (return on assets), leverage (debt ratio), and liquidity (current ratio). The formula used to calculate the X-score (the company's potential for financial failure) is:

$$X\text{-Score} = -4.3 - 4.5X_1 + 5.7X_2 - 0.004X_3$$

Description:

$X_1$  = Earnings After Taxes / Total Assets

$X_2$  = Total Debt / Total Assets

$X_3$  = Current Asset / Current Liability

Based on the X-score, the company's condition is classified into two categories:

- a. If the X-score is  $> 0$  (positive), the company is predicted to be bankrupt.
- b. If the X-score is  $< 0$  (negative), the company is predicted to be healthy.

## 3. Proposed Method

Research (Fitriani et al., 2020) based on Altman Z-Score calculations indicates that PT. Indofarma, Tbk. is likely to go bankrupt between 2018 and 2022. Meanwhile, Zmijewski's X-Score analysis indicates that the company was healthy between 2018 and 2020. However, the company is likely to go bankrupt between 2021 and 2022. Research (Siswanto & Romadon, 2021) found that the bankruptcy prediction results from three models yielded inconsistent results. The Zmijewski model predicted that 43 samples would not go bankrupt. The Altman model found that 42 samples would not go bankrupt. The Springate model predicted that 36 samples would not go bankrupt. Research (Windayani et al., 2025) found that seven pharmaceutical companies listed on the Indonesia Stock Exchange (IDX) were not indicated to be bankrupt between 2021 and 2024 based on Grover model analysis. Research (Nurlinda & Hermuningsih, 2023) shows that PT Kimia Farma Tbk's financial ratios increased annually since the formation of the State-Owned Pharmaceutical Holding Company, while PT Indofarma Tbk experienced a decline in liquidity and profitability ratios, as well as an increase in solvency ratios.

Research (Nurezki, 2023) states that PT Indofarma Tbk, based on Altman's Z-Score, is in the grey area category and experienced an increase in the use of liabilities from 2016 to 2018, leading to increased financial burdens and losses. Research (Daryani & Herdina, 2023) indicates that PT Kimia Farma Tbk's Z-Score value from 2019 to 2022 is in the bankruptcy category. In 2019, PT Indofarma Tbk was categorized as potentially bankrupt. In 2020, it entered the grey area category. In 2021 and 2022, it re-entered the bankruptcy category.

Research (Azizah & Lastanti, 2022) using Z-Score calculations from 2016 to 2020 found that PT Kimia Farma Tbk was in the healthy category, but experienced a continuous decline in performance each year, categorizing it as bankrupt. Meanwhile, PT Indofarma Tbk was in the gray area category. Research (Soleha, 2022) revealed that PT Kimia Farma Tbk's financial performance, based on an analysis of four financial ratios: liquidity, solvency, activity, and profitability, was in poor condition from 2019 to 2021.

### 3.1. Research Methods

The research was conducted on state-owned pharmaceutical companies listed on the Indonesia Stock Exchange. This is a descriptive study with a quantitative approach. Data collection techniques included documentation, literature review, and online research. The research data were secondary data taken from the financial statements of PT Kimia Farma Tbk and PT Indofarma Tbk for the years 2021-2024. The data source was obtained from the official IDX website: [www.idx.co.id](http://www.idx.co.id). The data were analyzed using de-scriptive quantitative methods using the Springate model, the Grover model, and the Zmijewski model to detect corporate bankruptcy.

## 4. Results and Discussion

### 4.1 Working Capital to Total Assets

This ratio measures a company's liquidity and its ability to pay off all its short-term liabilities with current assets.

**Table 1.** Working Capital to Total Assets of PT. Kimia Farma Tbk.

Year	Current Assets (CA)	Current Liabilities (CL)	Working Capital (WC)	Total Asset (TA)	WC/TA
2021	6.200.763	5.980.180	220.583	17.760.195	0,012
2022	8.501.422	8.030.857	470.565	20.353.992	0,023
2023	5.208.682	10.139.321	-4.930.639	16.630.699	-0,296
2024	3.932.652	7.948.557	-4.015.905	14.967.031	-0,268

Source: Processed data, 2025

In 2021-2022, the WC/TA value was positive, increasing from 0.012 to 0.023. This indicates that PT Kimia Farma has sufficient assets to meet its short-term obligations. This indicates the company's operations are running well and has the potential to generate profits. Conversely, in 2022-2023, the WC/TA value was negative, at -0.296 and -0.268, indicating that PT Kimia Farma Tbk is experiencing liquidity difficulties.

**Table 2.** Working Capital to Total Assets of PT Indofarma Tbk.

Year	Current Assets/(CA)	Current Liabilities/(CL)	Working Capital / (WC)	Total Asset/(TA)	WC/TA
2021	1.411.390	1.045.188	366.202	2.011.879	0,182
2022	863.577	985.245	-121.668	1.534.000	-0,079
2023	198.992	1.231.088	-1.032.096	759.829	-1,358
2024	134.191	1.507.257	-1.373.066	618.159	-2,221

Source: Processed data, 2025

Table 2 shows that PT. Indofarma Tbk's WC/TA value has experienced a significant decline each year. The WC/TA value for 2021 was 0.182, indicating the company's liquidity was considered healthy because its current assets exceeded its current liabilities. Meanwhile, from 2022 to 2024, PT. Indofarma Tbk indicated liquidity issues because its current assets were unable to cover its long-term debt.

### 4.2 EBIT to Total Assets

This ratio indicates the ability of a company's total assets to generate profit before taxes and interest.

**Table 3.** EBIT to Total Assets.

Year	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	EBIT	Total Assets	EBIT/TA	EBIT	Total Assets	EBIT/TA
2021	985.639	17.760.195	0,055	51.977	2.011.879	0,026
2022	558.071	20.353.992	0,027	-479.544	1.534.000	-0,313

2023	1.710.325	16.630.699	-0,103	-603.461	759.829	-0,794
2024	-810.720	14.967.031	-0,054	-253.728	618.159	-0,410

Source: Processed data, 2025

Table 3 shows that PT Kimia Farma Tbk's EBIT/TA values for 2021-2022 were 0.055 and 0.027, respectively. During this period, the company generated profits from operational activities. However, in 2023-2024, the EBIT to total assets ratio was negative, at -0.103 and -0.054, respectively. This indicates inefficient asset utilization, resulting in an inability to generate sufficient profits to cover operating costs. Even worse, PT Indofarma Tbk experienced a negative EBIT to total assets ratio for the three years from 2022 to 2024, indicating an operational loss.

#### 4.3 EBT to Current Liabilities

This ratio indicates a company's ability to pay off its current liabilities using profit before tax.

**Table 4.** EBT to Current Liabilities.

Year	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	EBT	Current Liabilities	EBT/CL	EBT	Current Liabilities	EBT/CL
2021	392.883	5.980.180	0,066	8.773	1.045.188	0,008
2022	49.622	8.030.857	0,006	-517.558	985.245	-0,525
2023	2.280.444	10.139.321	-0,225	-283.758	1.231.088	-0,230
2024	1.229.699	7.948.557	-0,155	-699.509	1.507.257	-0,464

Source: Processed data, 2025

Table 4 shows that both companies have current liabilities significantly greater than their pre-tax profit. This indicates that PT Kimia Farma Tbk and PT Indofarma Tbk are facing difficulties in meeting their short-term obligations.

#### 4.5 Sales to Total Assets

This ratio measures a company's efficiency in using all its assets to generate sales.

**Table 5.** Sales to Total Assets.

Year	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	Sales	Total Assets	TATO	Sales	Total Assets	TATO
2021	12.857.626	17.760.195	0,724	2.901.987	2.011.879	1,442
2022	9.606.145	20.353.992	0,472	1.144.108	1.534.000	0,746
2023	9.871.842	16.630.699	0,594	523.599	759.829	0,689
2024	9.938.958	14.967.031	0,664	210.380	618.159	0,340

Source: Processed data, 2025

Table 5 shows that PT. Kimia Farma Tbk has had a relatively low TATO score for four years, with the TATO score being below 1. A good TATO score is close to 1. This result indicates that the company's management is not optimally utilizing its assets to generate sales. PT. Indofarma Tbk's asset turnover ratio has declined periodically from 2021 to 2024. This indicates that the company has assets that are less productive in increasing sales.

#### 4.6 Net Profit to Total Assets

This ratio is used to assess the efficiency of a company's asset utilization in generating profits.

**Table 6.** Net Profit to Total Assets.

Years	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	Net Profit	Total Assets	ROA	Laba bersih	Total Assets	ROA
2021	289.888	17.760.195	0,016	-37.571	2.011.879	-0,019
2022	-94.326	20.353.992	-0,005	-428.488	1.534.000	-0,279
2023	-2.260.684	16.630.699	-0,136	-721.000	759.829	-0,949

2024	-1.208.172	14.967.031	-0,081	-334.492	618.159	-0,541
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Source: Processed data, 2025

Table 6 shows that PT. Kimia Farma Tbk recorded a positive ROA of 0.016 in 2021. However, from 2022 to 2024, PT. Kimia Farma Tbk recorded a negative ROA for three consecutive years. Similarly, PT. Indofarma Tbk recorded a negative ROA from 2021 to 2024. This negative ROA indicates that both companies are unable to effectively utilize their assets to generate profits.

#### 4.7 Total Liabilities to Total Assets

This ratio used to assess the extent to which a company's assets are financed by debt.

**Table 7.** Total Debt to Total Assets.

Year	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	Debt	Assets	DAR	Debt	Assets	DAR
2021	10.528.322	17.760.195	0,593	1.503.569	2.011.879	0,747
2022	11.014.702	20.353.992	0,541	1.447.651	1.534.000	0,944
2023	11.852.459	16.630.699	0,713	1.563.981	759.829	2,058
2024	11.538.223	14.967.031	0,771	1.762.201	618.159	2,851

Source: Processed data, 2025

Table 7 shows that PT. Kimia Farma Tbk has a Debt to Asset Ratio (DAR)  $> 0.5$ , while the ideal average DAR is  $< 0.5$ . PT. Kimia Farma Tbk's DAR is considered high, indicating that the company's assets are primarily financed by debt. In 2021 and 2022, PT. Indofarma Tbk achieved a DAR close to 1, indicating that debt was nearly equal to total assets. Meanwhile, in 2023 and 2024, the DAR was above 2, indicating that PT. Indofarma Tbk's total debt exceeded its total assets. This indicates that PT. Indofarma Tbk has relied heavily on debt to finance its assets.

#### 4.8 Current Ratio to Current Liabilities

This ratio is used to determine a company's ability to pay off its short-term liabilities with current assets.

**Table 8.** Current Asset to Current Liabilities.

Year	PT. Kimia Farma Tbk			PT. Indofarma Tbk		
	Current Asset	Current Liabilities	CA/CL	Current Asset	Current Liabilities	CA/CL
2021	6.200.763	5.980.180	1,037	1.411.390	1.045.188	1,350
2022	8.501.422	8.030.857	1,059	863.577	985.245	0,877
2023	5.208.682	10.139.321	0,514	198.992	1.231.088	0,162
2024	3.932.652	7.948.557	0,495	134.191	1.507.257	0,089

Source: Processed data, 2025

The table above shows that PT. Kimia Farma Tbk's current ratio for 2021 and 2022 was 1.037 and 1.059, respectively. In this situation, the company's ability to pay its current liabilities is considered good because the value of current assets is higher than its current liabilities. However, in 2023 and 2024, the current ratio decreased significantly to 0.514 and 0.495. From 2023 to 2024, PT. Kimia Farma Tbk experienced difficulty covering its current liabilities because the value of its current liabilities was greater than the value of its current assets. In 2021, PT. Indofarma Tbk had a fairly good level of liquidity with a current ratio of 1.350. This condition is inversely proportional in the period from 2022 to 2024, where the current ratio value was 0.162 and 0.089. This indicates that PT. Indofarma Tbk is experiencing liquidity problems because the amount of current assets is insufficient to cover its short-term debt.

#### 4.9 Springate Model Prediction Results

**Table 9.** Bankruptcy Prediction Results for PT Kimia Farma Tbk.

Variables	Coefficient	2021	2022	2023	2024
WC/TA	1,03	0,012	0,023	-0,296	-0,268
EBIT/TA	3,07	0,055	0,027	-0,103	-0,054

EBT/CL	0,66	0,066	0,006	-0,225	-0,155
S/TA	0,40	0,724	0,472	0,594	0,664
S-score		0,516	0,301	-0,532	-0,279
Interpretation		< 0,862	< 0,862	< 0,862	< 0,862
Category		Bankrupt	Bankrupt	Bankrupt	Bankrupt

Source: Processed data, 2025

The Springgate model calculation results show that the highest S-score occurred in 2021, at 0.516, and the lowest S-score was -0.532 in 2023. The S-score remained positive from 2021 to 2022, while negative values were recorded in 2023 and 2024. Over the four-year period, PT Kimia Farma achieved an S-score below 0.862, indicating that the company's financial condition, based on the Springgate model calculations, is considered bankrupt.

**Table 10.** Bankruptcy Prediction Results for PT Indofarma Tbk.

Variables	Coefficient	2021	2022	2023	2024
WC/TA	1,03	0,182	-0,079	-1,358	-2,221
EBIT/TA	3,07	0,026	-0,313	-0,794	-0,410
EBT/CL	0,66	0,008	-0,525	-0,230	-0,464
S/TA	0,40	1,442	0,746	0,689	0,340
S-score		0,849	-1,090	-3,714	-3,718
Interpretation		< 0,862	< 0,862	< 0,862	< 0,862
Category		Bankrupt	Bankrupt	Bankrupt	Bankrupt

Source: Processed data, 2025

Table 10 shows the highest S-score value, 0.849, in 2021, and the lowest value, -3.718, in 2024. The S-score values have been decreasing steadily. Positive S-scores only occurred in 2021, while negative S-scores were recorded from 2022 to 2024. The Springgate model analysis indicates that PT. Indofarma Tbk is categorized as bankrupt from 2021 to 2024.

#### 4. 10 Grover Model Prediction Results

**Table 11.** Bankruptcy Prediction Results for PT. Kimia Farma Tbk.

Variables	Coefficient	2021	2022	2023	2024
WC/TA	1,65	0,012	0,023	-0,296	-0,268
EBIT/TA	3,404	0,055	0,027	-0,103	-0,054
EAIT/TA	0,016	0,016	-0,005	-0,136	-0,081
	0,057				
G-score		0,266	0,188	-0,780	-0,569
Interpretation		> 0,01	> 0,01	< -0,02	< -0,02
Category		Safe	safe	Bankrupt	Bankrupt

Source: Processed data, 2025

The Grover model calculation for PT. Kimia Farma Tbk shows that the highest G-score was 0.266 in 2021 and the lowest was -0.780 in 2023. In 2021 and 2022, the company was categorized as healthy, based on a G-score above 0.01. Meanwhile, from 2023 to 2024, the company was categorized as bankrupt, based on a G-score below -0.02. Based on the Grover model analysis, PT. Kimia Farma Tbk is predicted to be in the bankruptcy category starting in 2023 to 2024.

**Table 12.** Bankruptcy Prediction Results for PT. Indofarma Tbk.

Variables	Coefficient	2021	2022	2023	2024
WC/TA	1,65	0,182	-0,079	-1,358	-2,221
EBIT/TA	3,404	0,026	-0,313	-0,794	-0,410
EAIT/TA	0,016	-0,019	-0,279	-0,949	-0,541
	0,057				
G-score		0,446	-1,134	-4,873	-4,997
Interpretation		> 0,01	< -0,02	< -0,02	< -0,02
Category		Safe	Bankrupt	Bankrupt	Bankrupt

Source: Processed data, 2025

The Grover model analysis for PT. Indofarma Tbk revealed the highest G-score of 0.446 in 2021, and the lowest value of -4.997 in 2024. The company's condition in 2021 was categorized as healthy, with a G-score of  $0.446 > 0.01$ . Meanwhile, from 2022 to 2024, the company achieved a negative G-score, below -0.02, placing it in the bankruptcy zone. The Grover model calculations indicate that PT. Indofarma Tbk is predicted to be in the bankruptcy category from 2022 to 2024.

#### 4.11 Zmijewski Model Prediction Results

**Table 13.** Bankruptcy Prediction Results for PT. Kimia Farma Tbk.

Variables	Coefficient	2021	2022	2023	2024
	-4,3				
EAT/TA	4,5	0,016	-0,005	-0,136	-0,081
TL/TA	5,7	0,593	0,541	0,713	0,771
CA/CL	0,004	1,037	1,059	0,514	0,495
Z-score		-0,999	-1,199	0,372	0,455
Interpretation		< 0	< 0	> 0	> 0
Category		Safe	Safe	Bankrupt	Bankrupt

Source: Processed data, 2025

The calculation results based on the Zmijewski model show a negative Z-score and less than 0 in 2021 and 2022, indicating the company is in the healthy category. Meanwhile, the Z-score values for 2023 and 2024 are positive and greater than 0, indicating the company is in the bankrupt category. The Zmijewski model calculations indicate that PT Kimia Farma Tbk is predicted to be healthy in 2021-2022, then enter the bankrupt category from 2023-2024.

**Table 14.** Bankruptcy Prediction Results for PT Indofarma Tbk.

Variables	Coefficient	2021	2022	2023	2024
	-4,3				
EAT/TA	4,5	-0,019	-0,279	-0,949	-0,541
TL/TA	5,7	0,747	0,944	2,058	2,851
CA/CL	0,004	1,350	0,877	0,162	0,089
Z-score		0,039	2,333	11,702	14,384
Interpretation		> 0	> 0	> 0	> 0
Category		Bankrupt	Bankrupt	Bankrupt	Bankrupt

Source: Processed data, 2025

From the results of the Zmijewski model analysis for PT. Indofarma Tbk, a positive Z-score value was obtained from 2021 to 2024. The highest Z-score value was 14.384 in 2024 and the lowest value was 0.039 in 2021, all Z-score values were above 0, indicating that the condition of PT. Indofarma Tbk was included in the bankruptcy category.

#### Discussion

PT Kimia Farma Tbk's financial performance, in terms of liquidity, was considered healthy for the 2021-2022 period. This is evident from the current ratio, which was above 1, indicating that current assets were adequately covering current liabilities. The working capital-to-total assets ratio was quite healthy, with a positive ratio. However, in the 2023-2024 period, the current and working capital ratios actually resulted in negative ratios. This condition indicates that the company is struggling to meet its current liabilities. In terms of solvency, a debt-to-asset ratio above 0.5 indicates that the company is using debt more to finance its assets. The asset turnover ratio fluctuated from 2021 to 2024 and was considered low, with a value below 1. The company was not utilizing its assets effectively, resulting in unstable sales. Profitability performance resulted in a positive net profit margin in 2021. In subsequent periods, the company experienced consecutive net losses. Springate model analysis indicates that PT Kimia Farma Tbk is in the bankruptcy category from 2021-2024. Meanwhile, Grover and Zmijewski's model yielded different results from Springate's analysis. The Grover and

Zmijewski analysis categorized PT Kimia Farma Tbk as healthy in 2021 and bankrupt in 2023 and 2024.

The liquidity of PT. Indofarma Tbk in 2021 was considered quite good, as seen from the current ratio value above 1 and the working capital ratio was still positive. However, from 2022 to 2024, the current ratio and working capital decreased drastically and even became negative, so the company was declared illiquid. In addition to liquidity issues, the company also faced poor solvency issues. The debt-to-asset ratio continued to increase, even in 2023, total debt exceeded assets and continued until 2024. The asset turnover condition from 2021-2024 showed a downward trend, so the company was categorized as not good condition. PT. Indofarma Tbk also experienced a decline in sales and a decrease in assets. From a profitability aspect, there were continuous losses from 2021 to 2024. This was due to the drastic decline in sales accompanied by high operating expenses. The results of the Springate and Zmijewski model analysis predict that PT. Indofarma Tbk's financial condition from 2021-2024 is in the bankruptcy category. Meanwhile, the Grover model predicts that PT. Indofarma Tbk was categorized as bankrupt from 2022 to 2024. This analysis aligns with research (Mangopo et al., 2025), which placed PT. Indofarma Tbk in the bankruptcy category from 2022 to 2024 based on the Altman Z-Score method.

If the financial conditions of both companies continue to deteriorate and no concrete steps are taken immediately to improve their performance, PT Kimia Farma Tbk and PT Indofarma Tbk are highly likely to face bankruptcy in the next few years. To avoid future bankruptcy, management must immediately take various strategic steps, both financially and non-financially. Financial management efforts include comprehensively improving financial conditions, improving cash flow, reducing dependence on external financing, ensuring sufficient liquidity, optimizing assets to reduce operating expenses, increasing operational efficiency, increasing productivity and revenue, and seeking new strategies to achieve positive profits. In addition to improving financial performance, companies must also address non-financial aspects such as creating a more transparent financial system, enhancing good corporate governance, improving corporate image, and enhancing competitiveness.

## 5. Conclusion

The Springate model analysis predicts PT Kimia Farma Tbk's financial condition will be in the bankruptcy category from 2021 to 2024. Meanwhile, the Grover and Zmijewski model analysis predicts PT Kimia Farma Tbk will be in a healthy category from 2021 to 2022. However, PT Kimia Farma Tbk will enter the bankruptcy category from 2023 to 2024. The potential for PT Kimia Farma Tbk's bankruptcy is influenced by its poor liquidity, reliance on debt to finance assets, unproductive asset management, and ongoing losses.

The Zmijewski and Springate model analysis categorizes PT Indofarma Tbk's financial condition as bankrupt from 2021 to 2024. Meanwhile, the Grover model predicts PT Indofarma Tbk will be in a healthy position for 2021. However, PT Indofarma Tbk will then enter the bankruptcy category from 2022 to 2024. The causes of PT. Indofarma Tbk faces the potential for bankruptcy due to declining sales and assets, debt exceeding assets, liquidity difficulties, and a continuing loss trend.

To improve and stabilize PT Kimia Farma Tbk's financial condition and save it from bankruptcy, Bio Farma, as the holding company for state-owned pharmaceutical companies, is expected to implement stricter oversight of the new management. Firm action should be taken against allegations of financial statement manipulation, fictitious transactions, and attempts to embellish financial statements to prevent similar cases from recurring in the future. This study was conducted on only two state-owned companies over a four-year period. Future researchers are advised to use all state-owned companies listed on the Indonesia Stock Exchange and employ other prediction models for further research.

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