

**BANKRUPTCY PREDICTION ANALYSIS USING THE SPRINGATE S-SCORE METHOD IN AUTOMOTIVE AND COMPONENT SUBSECTOR COMPANIES IN 2019-2023****Ayu Anggraeni<sup>1</sup>, Maria Theresia Heni Widyarti<sup>2</sup>, Siti Arbainah<sup>3</sup>**

## AFFILIATIONS

<sup>1</sup>Department of Accounting, Semarang State Polytechnic, Indonesia<sup>2</sup>Department of Accounting, Semarang State Polytechnic, Indonesia<sup>3</sup>Department of Accounting, Semarang State Polytechnic, Indonesia\*Corresponding Author E-mail: [ayuanggraeni530@gmail.com](mailto:ayuanggraeni530@gmail.com)

**Abstract:** This study aims to analyze the financial condition of Automotive and Component Subsector Companies listed on the Indonesia Stock Exchange in 2019-2023. The sample companies used were 10 out of 18 companies taken using purposive sampling techniques. The research method used is quantitative descriptive, which examines secondary data in balance sheets and company income statements. The analysis was carried out using the Springate S-Score Method, which consists of 4 ratios: Working Capital to Total Assets, Earning Before Interest and Tax to Total Assets, Earning Before Tax to Current Liabilities, and Sales to Total Assets. The study results show that, on average, automotive and component subsector companies are in good health or have not gone bankrupt. So, the company needs to maintain its financial condition to avoid bankruptcy.

**Keywords:** Automotive and Components; Bankruptcy; Springate S-Score.

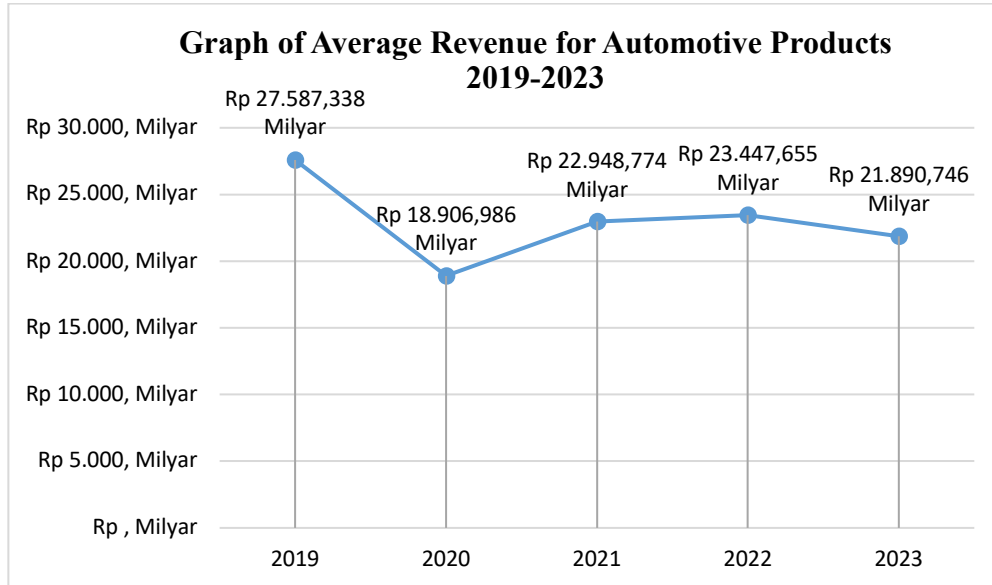
**INTRODUCTION****Introduction**

The automotive industry plays an important role in the development of manufacturing in Indonesia, and it is supported by global companies establishing and expanding their production facilities. As Southeast Asia's largest economy, Indonesia is an export assembly centre and a fast-growing market. This growth contributes to increasing GDP, job creation and other sectors. The Coordinating Minister for Economic Affairs, Airlangga Hartarto, stated that Indonesia has become an industrial country, with the manufacturing sector as the most significant contributor to the national economy, exceeding 20% (Mahardika & Setyawan, 2022).

In December 2019, the Coronavirus Disease-2019 (COVID-19) pandemic was first detected in Wuhan, China, and quickly spread to various parts of the world (Chen et al., 2020). Cases started to soar until they ended with the implementation of large-scale social restrictions (PSBB). As a result, only 58.95% of businesses could operate normally, while the other 82.45% experienced a decline in income (Badan Pusat Statistik, 2020). The following graph shows the average automotive company revenue from 2019-2023.

# Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah



**Figure 1. Average Revenue for Automotive Products 2019-2023**

Source: Processed Data, 2025

Currently, the conflict in the Middle East is also affecting global supply chains, which can potentially increase the cost of goods and raw materials. During geopolitical tension, energy prices such as oil and gas tend to rise, increasing production costs that depend on energy as a central component (Sari, 2021). An increase in fuel prices tends to trigger an increase in the prices of various commodities on the market. As a result, people's purchasing power decreases, which then affects production and causes a decrease in national income.

## Research Purposes

According to Bank Indonesia, based on the results of the Board of Governors Meeting (RDG) on 21-22 September 2022, BI decided to increase the BI-Rate by 50 bps to 3.75%, which will continue until the end of 2024 to 6% in less than 2 years. The increase in December 2023 is quite high after the COVID-19 pandemic. This condition also impacts various sectors, especially those sensitive to credit interest rates, such as the decline in public consumption of automotive and property products.

There was also bankruptcy for several companies, such as PT. Nipress Tbk on May 31 2022, and PT. Alloy Steel Universal Tbk on February 29 2024, is a warning to other companies in the automotive subsector to take preventive steps. Therefore, this research was conducted to determine the financial condition of automotive and component subsector companies using the Springate S-Score method and determine strategies to face the possible risk of bankruptcy.

## LITERATURE REVIEW

### Understanding Bankruptcy

According to (Hanafi, 2004) a company is considered bankrupt when it faces various levels of difficulty, ranging from minor problems such as liquidity to serious issues such as insolvency, namely when the company's debts exceed its assets. Meanwhile, (Altman et al., 2019) stated that company failure and filing for bankruptcy were caused by problematic financial conditions and/or financial pressure.

### Causes of Bankruptcy

Three main factors cause bankruptcy. First, general factors include economic, social, technological, and government policy aspects. Second, external factors include the influence of customers, suppliers, and competitors. Third, internal factors originate from within the

**Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023**

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah

company itself, such as less organized management, high levels of credit given to clients, and other factors (Sembiring, 2016).

**Understanding Springate S-Score**

According to (Robiansyah et al., 2022) , the bankruptcy prediction method was created by Gordon L.V. Springate in 1978 at Simon Fraser University. In this method, (Sihabudin et al. 2018) stated that the method used in Springate is the same as Altman, namely Multiple Discriminant Analysis (MDA). After testing, the Springate S-Score Method obtained 4 (four) ratios, which were considered capable of differentiating between bankrupt and non-bankrupt businesses. In 1978, the Springate Method (1978) was formulated as follows:

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

Information :

S = Indeks Springate S-Score

$X_1$  = Working Capital/Total Asset

$X_2$  = Earning before Interest and Tax/Total Asset

$X_3$  = Earning before Tax/Current Liabilities

$X_4$  = Sales/Total Assets

Based on the ratios from the Springate S-Score method above, an S-Score criterion can be identified which can be seen in Table 1 below.

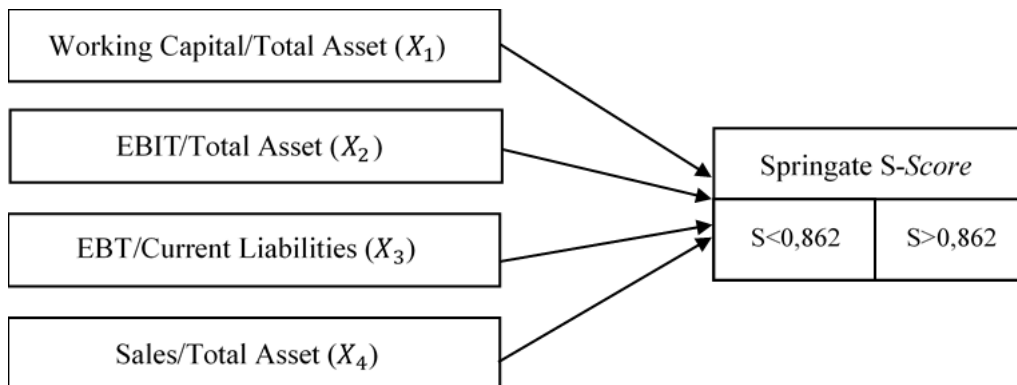
**Table 1**  
**Criteria of S-Score**

Assessment Standards	Interpretation
$S < 0,862$	Tidak Bangkrut
$S > 0,862$	Bangkrut

Source: (Prasetyani & Sofyan, 2020)

**Framework**

Based on theoretical studies and previous research results related to bankruptcy prediction analysis using the Springate S-Score method, the research model is described as follows.



**Figure 2. Research Framework**

Source: (Syarifuddin et al., 2022)

**RESEARCH METHODOLOGY**

**Types and Objects of Research**

A research method is a method or procedure used in scientific research to collect data for a specific purpose (Sugiyono, 2013). This research uses a quantitative descriptive method by examining secondary data obtained from balance sheets and profit and loss reports of automotive and components subsector companies listed on the Indonesia Stock Exchange in

## Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah

2019–2023 sourced from the official websites of each company and the Indonesian Stock Exchange website, namely [www.idx.co.id](http://www.idx.co.id).

### Population and Sample

The population in this research is all automotive and component subsector companies listed on the Indonesia Stock Exchange 2019-2023. It used a purposive sampling method with certain criteria, as follows.

1. Automotive and components subsector companies go public listed on the Indonesia Stock Exchange in 2019-2023.
2. IPO (Initial Public Offering) before 2019.

Based on the criteria outlined above, 10 companies out of a total of 18 that went public on the Indonesian Stock Exchange were obtained, namely as follows.

**Table 2. Sample of Companies**

No.	Kode Perusahaan	Nama Perusahaan	IPO
1.	ASII	PT Astra International Tbk	4 April 1990
2.	AUTO	PT Astra Otoparts Tbk	15 Juli 1889
3.	BOLT	PT Garuda Metalindo Tbk	7 Juli 2015
4.	BRAM	PT Indo Kordsa Tbk	05 September 1990
5.	GDYR	PT Goodyear Indonesia Tbk	22 Desember 1980
6.	GJTL	PT Gajah Tunggal Tbk	8 Mei 1990
7.	INDS	PT Indospring Tbk	18 Oktober 1995
8.	LPIN	PT Multi Prima Sejahtera Tbk	6 Desember 1990
9.	MASA	PT Multisrada Arah Sarana Tbk	23 Juli 2007
10.	SMSM	PT Selamat Sempurna Tbk	29 November 1989

Source: Processed Data, 2025

## RESULTS AND ANALYSIS

The following calculations are based on data obtained from the financial reports of 10 sample companies listed on the Indonesia Stock Exchange for 2019-2023 using multiple discriminant analysis.

**Table 3**  
 **$X_1$  Variable Calculation**

Working Capital/Total Assets						
No.	Kode Saham	2019	2020	2021	2022	2023
1	ASII	0,083	0,138	0,154	0,147	0,092
2	AUTO	0,131	0,157	0,136	0,171	0,196
3	BOLT	0,290	0,185	0,372	0,414	0,431
4	BRAM	0,227	0,216	0,214	0,259	0,203
5	GDYR	-0,215	-0,205	-0,171	-0,186	-0,148
6	GJTL	0,142	0,162	0,196	0,187	0,206
7	INDS	0,280	0,297	0,292	0,268	0,241
8	LPIN	0,400	0,400	0,308	0,317	0,350
9	MASA	0,125	0,120	0,156	0,111	0,235
10	SMSM	0,540	0,562	0,549	0,552	0,584

Source: Secondary data processed, 2025

**Table 4**  
**X<sub>2</sub> Variable Calculation**

Earning Before Interest and Tax (EBIT)/Total Asset						
No.	Kode Saham	2019	2020	2021	2022	2023
1	ASII	0,104	0,067	0,087	0,121	0,123
2	AUTO	0,070	0,007	0,042	0,091	0,119
3	BOLT	0,080	-0,034	0,095	0,074	0,132
4	BRAM	0,077	-0,013	0,126	0,159	0,083
5	GDYR	0,007	-0,003	0,026	-0,002	0,073
6	GJTL	0,071	0,069	0,046	0,020	0,114
7	INDS	0,046	0,026	0,066	0,081	0,063
8	LPIN	0,074	0,007	0,066	0,073	0,080
9	MASA	0,012	0,065	0,126	0,150	0,186
10	SMSM	0,266	0,206	0,241	0,270	0,282

Source: Secondary data processed, 2025

**Table 5**  
**X<sub>3</sub> Variable Calculation**

Earning Before Tax (EBT)/Current Liabilities						
No.	Kode Saham	2019	2020	2021	2022	2023
1	ASII	0,341	0,254	0,312	0,423	0,438
2	AUTO	0,326	0,042	0,175	0,372	0,534
3	BOLT	0,276	-0,224	0,758	0,588	1,287
4	BRAM	0,614	-0,117	0,569	0,853	0,427
5	GDYR	-0,019	-0,042	0,035	-0,006	0,109
6	GJTL	0,084	0,100	0,020	-0,035	0,335
7	INDS	0,790	0,464	0,420	0,432	0,380
8	LPIN	2,910	0,501	1,665	1,246	1,854
9	MASA	-0,127	0,275	0,445	0,543	0,763
10	SMSM	1,782	1,718	1,378	1,663	2,032

Source: Secondary data processed, 2025

**Table 6**  
**X<sub>4</sub> Variable Calculation**

Sales/Total Assets						
No.	Kode Saham	2019	2020	2021	2022	2023
1	ASII	0,674	0,518	0,636	0,729	0,710
2	AUTO	0,964	0,782	0,894	1,003	1,007
3	BOLT	0,953	0,705	0,864	1,007	1,090
4	BRAM	0,879	0,639	0,896	1,152	0,843
5	GDYR	1,157	0,929	1,252	1,386	1,513
6	GJTL	0,845	0,756	0,834	0,903	0,894
7	INDS	0,738	0,575	0,850	0,938	0,853
8	LPIN	0,272	0,305	0,388	0,512	0,403
9	MASA	0,706	0,648	0,887	1,004	0,934
10	SMSM	1,267	0,958	1,076	1,117	1,115

Source: Secondary data processed, 2025

**Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023**

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah

**Table 7**  
**Springate S-Score**

No.	Kode Saham	2019	2020	2021	2022	2023
1	ASII	0,898	0,723	0,887	1,093	1,046
2	AUTO	0,951	0,524	0,742	1,102	1,321
3	BOLT	1,108	0,219	1,520	1,443	2,133
4	BRAM	1,228	0,360	1,342	1,780	1,084
5	GDYR	0,250	0,124	0,427	0,353	0,749
6	GJTL	0,757	0,746	0,688	0,593	1,140
7	INDS	1,246	0,923	1,122	1,186	1,033
8	LPIN	2,669	0,885	1,773	1,576	1,992
9	MASA	0,364	0,763	1,196	1,334	1,690
10	SMSM	3,057	2,729	2,647	2,941	3,252

Source: Secondary data processed, 2025

In 2019, 3 (three) companies in the Automotive and Component Subsector were indicated to be bankrupt, namely PT Goodyear Indonesia Tbk, PT Gajah Tunggal Tbk and PT Multistrada Arah Sarana Tbk. Meanwhile, there were 7 (seven) companies in the Automotive and Component Subsector whose financial condition was healthy or not bankrupt, namely PT Astra International Tbk, PT Astra Otoparts Tbk, PT Garuda Metalindo Tbk, PT Indo Kordsa Tbk, PT Indospring Tbk, PT Multi Prima Sejahtera and PT Selamat Sempurna Tbk.

In 2020, there were 7 (seven) companies indicated to be bankrupt, namely PT Astra International Tbk, PT Astra Otoparts Tbk, PT Garuda Metalindo Tbk, PT Indo Kordsa Tbk, PT Goodyear Indonesia Tbk, PT Gajah Tunggal Tbk, and PT Multistrada Arah Sarana Tbk. Meanwhile, there are 3 (three) companies in the Automotive and Component Subsector, namely PT Indospring Tbk, PT Multi Prima Sejahtera, and PT Selamat Sempurna Tbk, which have healthy financial conditions and are not bankrupt.

In 2021, 4 (four) companies in the Automotive and Component Subsector were indicated to be bankrupt, namely PT Astra Otoparts Tbk, PT Goodyear Indonesia Tbk, PT Gajah Tunggal Tbk and PT Multistrada Arah Sarana Tbk. Meanwhile, there are 6 (six) companies in the Automotive and Component Subsector whose financial conditions are healthy or not bankrupt, namely PT Astra International Tbk, PT Garuda Metalindo Tbk, PT Indo Kordsa Tbk, PT Indospring Tbk, PT Multi Prima Sejahtera and PT Selamat Sempurna Tbk.

In 2022, 2 (two) companies in the Automotive and Component Subsector were indicated to be bankrupt, namely PT Goodyear Indonesia Tbk and PT Gajah Tunggal Tbk. Meanwhile, there are 8 (eight) companies in the Automotive and Component Subsector whose financial condition is healthy or not bankrupt, namely PT Astra International Tbk, PT Astra Otoparts Tbk, PT Garuda Metalindo Tbk, PT Indo Kordsa Tbk, PT Indospring Tbk, PT Multi Prima Sejahtera, PT Multistrada Arah Sarana Tbk and PT Selamat Sempurna Tbk.

In 2023, 1 (one) company in the Automotive and Component Subsector is indicated to be bankrupt, namely PT Goodyear Indonesia Tbk. Meanwhile, there are 9 (nine) companies in the Automotive and Component Subsector whose financial condition is healthy or not bankrupt, namely PT Astra International Tbk, PT Astra Otoparts Tbk, PT Garuda Metalindo Tbk, PT Indo Kordsa Tbk, PT Gajah Tunggal Tbk, PT Indospring Tbk, PT Multi Prima Sejahtera, PT Multistrada Arah Sarana Tbk and PT Selamat Sempurna Tbk.



## Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah

After knowing the calculation and data analysis using the Springate S-Score method, the average condition of the automotive and component sub-sector companies in 2019-2023 is obtained as follows.

**Table 8**  
**Bankruptcy Prediction Results for Automotive and Component Companies**

Year	Financial Condition	Count of Companies	Average Conditions
2019	Bankrupt	3	Not Bankrupt
	Not Bankrupt	7	
2020	Bankrupt	7	Bankrupt
	Not Bankrupt	3	
2021	Bankrupt	4	Not Bankrupt
	Not Bankrupt	6	
2022	Bankrupt	2	Not Bankrupt
	Not Bankrupt	8	
2023	Bankrupt	1	Not Bankrupt
	Not Bankrupt	9	

Source: Secondary data processed, 2025

The results of the analysis show that the average automotive and component sub-sector companies listed on the Indonesia Stock Exchange in the 2019-2023 period are in a healthy financial condition or have not experienced bankruptcy. This is because the average company can pay off its current debt with its current assets, generate profit before interest and tax from the assets owned, and be efficient in using assets to generate sales.

The following are suggestions for automotive and component subsector companies listed on the Indonesia Stock Exchange for the 2019-2023 period.

1. Companies included in the non-bankruptcy criteria are expected to be able to maintain and improve their financial performance to prevent financial problems, which are a sign of bankruptcy.
2. Companies that have the potential to go bankrupt in a particular year are expected to be able to improve their financial performance and establish new strategies to avoid bankruptcy, namely as follows:
  - a. Companies can improve working capital management more optimally by efficiently managing current assets and short-term liabilities, thereby increasing working capital utilization.
  - b. Companies are advised to increase revenue by managing debt policies wisely and creating innovations in business operations.
  - c. Companies should achieve cost efficiency by reducing burdens related to production operations and selling fixed assets that are no longer needed or productive.
  - d. Companies need to conduct regular bankruptcy evaluations and analyses and take corrective steps to detect the possibility of bankruptcy.

Companies can increase sales by planning the right promotional strategy, determining potential consumer targets, and improving the quality of products or services offered.

## Bankruptcy Prediction Analysis Using the Springate S-Score Method in Automotive and Component Subsector Companies in 2019-2023

Ayu Anggraeni, Maria Theresia Heni Widyarti, Siti Arbainah

### CONCLUSION

Based on the bankruptcy prediction analysis results using the Springate S-Score method in automotive and component sub-sector companies listed on the Indonesia Stock Exchange in 2019–2023, it can be concluded that the average financial condition of the company is in a financially healthy condition or not bankrupt. The strategy that the company can implement to maintain its financial condition to avoid bankruptcy is to pay more attention to working capital management, increase business income and sales turnover, and carry out cost efficiency incurred by the company.

### BIBLIOGRAPHY

- Altman, E. I., Hotchkiss, E., & Wang, W. (2019). *One The Economic and Legal Framework of Corporate Restructuring and Bankruptcy I Corporate Financial Distress, Restructuring, and Bankruptcy: Analyze Leveraged Finance, Distressed Debt, and Bankruptcy, Fourth Edition Introduction and Statistical Background*.
- Hanafi, M. M. (2004). *Manajemen Keuangan*, edisi pertama, cetakan kedua, penerbit: BPFE. Universitas Gadjah Mada, Yogyakarta.
- Mahardika, B., & Setyawan, S. (2022). Analisis Kebangkrutan Perusahaan Otomotif Dimasa Pandemi Covid-19 Menggunakan Analisis Model Altman Z-Score, Zmijewski, Dan Grover. *Jurnal Cakrawala Ilmiah*, 1(7), 1659–1670.
- Prasetyani, E., & Sofyan, M. (2020). Bankruptcy analysis using Altman Z-score model and Springate model in retail trading company listed in Indonesia Stock Exchange. *Ilomata International Journal of Tax and Accounting*, 1(3), 139–144.
- Robiansyah, A., Yusmanianti, Y., Sari, I. K., Novrianda, H., & Irwanto, T. (2022). Analisis Perbandingan Model Altman, Springate, Zmijewski, Dan Grover Dalam Memprediksi Kebangkrutan Perusahaan Di Bursa Efek Indonesia (Studi Empiris Pada Perusahaan Manufaktur Yang Terdaftar Di Bursa Efek Indonesia Periode 2012-2017). *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi Dan Bisnis*, 10(S1), 25–36.
- Sembiring, E. E. (2016). Analisis Keakuratan Model Ohlson dalam Memprediksi Kebangkrutan (Delisting) Perusahaan yang Terdaftar di BEI. *Jurnal Akuntansi Keuangan Dan Bisnis*, 9, 1–9.
- Springate, G. L. V. (1978). *Predicting the Possibility of Failure in a Canadian Firm: A Discriminant Analysis* [Doctoral dissertation]. Simon Fraser University.
- Sugiyono, D. (2013). *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D*.
- Syarifuddin, K., Haerudin, M. I. M., & Ali, A. (2022). Analisis Potensi Kebangkrutan Dengan Metode Springate Pada Perusahaan Kosmetik Yang Terdaftar Di Bursa Efek Indonesia Periode 2016-2020. *Journal of Art, Humanity & Social Studies*, 2(6).