

BANKRUPTCY ANALYSIS OF TRANSPORTATION COMPANIES LISTED ON THE INDONESIAN SHARIA STOCK INDEX (ISSI) USING THE SPRINGATE AND GROVER METHOD BEFORE AND DURING THE PANDEMIC COVID-19

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Abstract

This research aims to compare the Springate and Grover bankruptcy models, evaluating their accuracy in predicting bankruptcies among transportation sector companies listed on the Indonesian Sharia Stock Index (ISSI) before and during Covid-19 (2018-2021). Conducted as quantitative research, the study utilizes secondary financial report data. Findings reveal significant differences between the two models, with the Grover method demonstrating higher accuracy in predicting bankruptcy among transportation sector companies on ISSI before and during the pandemic.

Keywords: Bankruptcy, Springate, Grover, Financial Reports.

1. Introduction

The arrival of the Covid-19 pandemic in Indonesia hit the survival of the business sector as well as the global stock exchange. All business sector indices in Indonesia experienced a decline and financial difficulties, one of the companies that experienced the most significant decline was the transportation sector. There are many parties who will suffer losses if a company goes bankrupt, therefore a bankruptcy prediction model is needed that can provide early warning for a company.

Financial Distress is a condition that indicates a stage of decline in the company's financial condition that occurs before bankruptcy (Imam Mas'ud, 2015). Financial distress, from an Islamic perspective, is viewed within the framework of Shariah principles, Analysis of company bankruptcy predictions is carried out as an early warning for the company. Even though it is called financial distress, company bankruptcy analysis does not always imply that a distressed company will eventually experience bankruptcy (Putu Riesty, 2020).

2. Literature Review

a. Definition of Financial Distress

Financial Distress is a condition that indicates a stage of decline in a company's financial condition that occurred before bankruptcy or liquidation. Financial distress can also be defined as the company's inability to pay financial obligations that are due (Ayu Suci, 2009). Financial distress can occur in various companies and can be a sign of bankruptcy that the company may experience. If the company is in a state of financial distress, management must be careful because it could enter the bankruptcy stage. The management of a company experiencing financial distress must take action to overcome these financial problems and prevent bankruptcy (Dwijayanti, 2010).

b. Bankruptcy Prediction

i. Springate Method

This model was developed in 1978 by Gorgon LV Springate. By following the procedure developed by Altman, Springate uses a stepwise multiple discriminate analysis to select four of 19 popular financial ratios so that they can distinguish companies that are in the bankruptcy zone or the safe zone (Erlyn, 2015). Using springate the Springate model (1978), the four ratios are formulated as follows:

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

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

The results of calculations using the Springate model will be explained as follows: if the S score > 0.862, it is a company that is not potentially bankrupt, whereas if the company has an S score < 0.862, it is an unhealthy company and has the potential to go bankrupt.

ii. Grover Method

The Grover model is a model made by restoration or redesign of the Altman Z-Score model. The Grover model requires X1 and X3 from the Altman model, which is then added to the profitability ratios shown by ROA (Fakhri and Galuh, 2014). Evi and Ratna (2013) conducted research using the Grover, Altman Z-Score, Springate, and Zmijewski bankruptcy prediction analysis models for food and beverage sector companies listed on the Indonesia Stock Exchange (IDX). As a result, the Grover model is the most appropriate predictive model to be applied to companies in the food and beverage sector (Ni Made Evi, 2013). From the results of the redesign of the Z-Score Altman model, the following functions are produced:

$$S\text{-score} = 1.650 X1 + 3.404 X2 + 0.016 ROA + 0.057$$

Information:

X1 = Working Capital / Total Assets Ratio

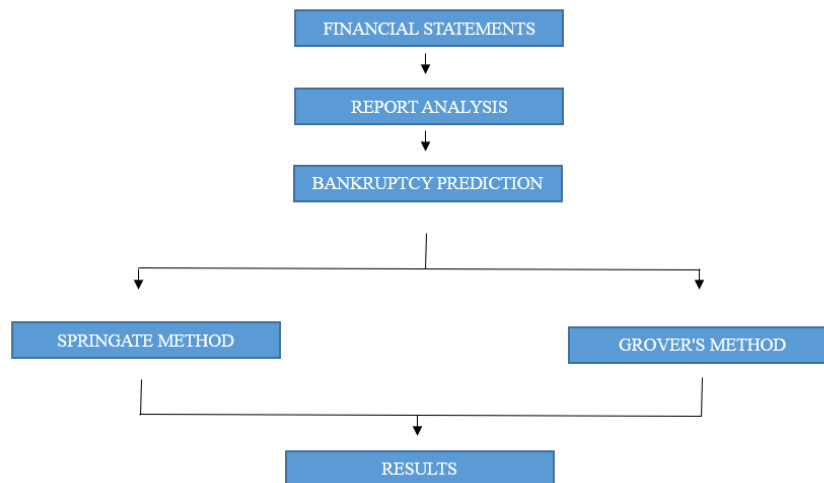
X2 = EBIT (Earnings Before Interest & Tax / Total Assets

ROA = Net Income / Total Assets Ratio

The results of calculations using the Grover model will be explained as follows: This model has criteria for assessing safe boundary conditions (not bankrupt) when the company is above 0.01. Then, the bankruptcy limit if the company is below -0.02.

3. Research Methods

Based on the explanation above, the research framework can be described as follows:



4. Result And Discussion

Discussions and Calculations Data Analysis

Springate Methode the results of calculating financial ratios for each transportation sub-sector company using the Springate method. The value of the Springate model for each company using the following formula:

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

So, it will produce Springate model values every year (2018-2021) for 16 companies presented in table 4.1 below:

Table 4.1 Springate Model Values

No	Company Name	Year	Springate Model Results
1	PT Humpuss Intermoda Transportasi Tbk. (HITS)	2018	0,520824507
		2019	0,507614332
		2020	0,207366351
		2021	0,446150637
2	PT Sillo Maritime Perdana Tbk. (SHIP)	2018	0,434840380
		2019	0,784476376
		2020	0,725790845
		2021	0,649242614
3	PT Pelayaran NasionalBina Buana Ray Tbk. (BBRM)	2018	0,940507728
		2019	0,604314394
		2020	0,953873139
		2021	- 0,109777463
4	PT Batulicin Nusantara Maritim Tbk. (BESS)	2018	2,709703491
		2019	0,204556465
		2020	0,767920125
		2021	1,502326378
5	PT Pelita Samudera Shipping Tbk. (PSSI)	2018	1,294659530
		2019	0,618102741
		2020	0,524548384
		2021	1,482864147
6	PT Transcoal Pasific Tbk. (TCPI)	2018	0,872833799
		2019	0,752171786
		2020	0,286917515
		2021	0,313900888
7	PT Pelayaran Tamrin Samudra Tbk. (TAMU)	2018	0,327233190
		2019	0,505519484
		2020	0,190845554
		2021	0,959874586
8	PT Indonesia Kendaraan Terminal Tbk. (IPCC)	2018	2,128673980
		2019	5,240460821
		2020	0,581502064
		2021	0,889468121
9	PT Jasa Armada Indonesia Tbk. (IPCM)	2018	1,800556570
		2019	1,419723526
		2020	1,080120016
		2021	1,443154085
10	PT Blue Bird Tbk. (BIRD)	2018	1,228377227
		2019	0,777544359
		2020	0,620920369
		2021	0,301648397
11	PT Eka Sari Lorena Transport Tbk. (LRNA)	2018	1,380069180
		2019	0,559823154
		2020	1,571276012
		2021	1,215736817
12	PT Express Trasindo UtamaTbk. (TAXI)	2018	1,649164984
		2019	0,510474932
		2020	- 0,750529998
		2021	17,387781201

13	PT Weha Transportasi Indonesia Tbk. (WEHA)	2018	0,189933712
		2019	0,324503744
		2020	1,538822474
		2021	0,459914513
14	PT Armada Berjaya Trans Tbk. (JAYA)	2018	0,380174344
		2019	0,424374624
		2020	0,822882533
		2021	1,391523811
15	PT Pelayaran Nelly Dwi Putri Tbk. (NELY)	2018	2,353232136
		2019	2,256874350
		2020	2,006264741
		2021	1,930748789
16	PT Samudera Indonesia Tbk. (SMDR)	2018	0,460420116
		2019	0,966717144
		2020	0,446431398
		2021	1,333572147

Grover Method

The results of calculating financial ratios for each transportation sub-sector company in the Grover method. The next step is to calculate the value of the Grover model for each company using the following formula:

$$S\text{-score} = 1.650 X1 + 3.404 X2 + 0.016 ROA + 0.057$$

This will produce the Grover model values for each year (2018-2021) for 16 companies presented in table 4.2 As follows:

Table 4.2 Calculating Grover Method Value

No	Company Name	Year	Grover Model Result
1	PT Humpuss Intermoda Transportasi Tbk. (HITS)	2018	0,223423401
		2019	0,183594784
		2020	- 0,037838432
		2021	0,187029183
2	PT Sillo Maritime Perdana Tbk. (SHIP)	2018	0,085358193
		2019	0,337970581
		2020	0,345855573
		2021	0,293989338
3	PT Pelayaran NasionalBina Buana Ray Tbk. (BBRM)	2018	0,336270224
		2019	0,233657770
		2020	0,417450925
		2021	- 0,337286690
4	PT Batulicin Nusantara Maritim Tbk. (BESS)	2018	1,300327103
		2019	- 0,070039115
		2020	0,331658848
		2021	0,714687540

5	PT Pelita Samudera Shipping Tbk. (PSSI)	2018	0,695732988
		2019	0,220321829
		2020	0,250551353
		2021	0,834151852
6	PT Transcoal Pasific Tbk. (TCPI)	2018	0,404844656
		2019	0,355160191
		2020	0,030382827
		2021	0,048284507
7	PT Pelayaran Tamrin Samudra Tbk. (TAMU)	2018	0,076180939
		2019	0,117353763
		2020	0,134842040
		2021	0,375478703
8	PT Indonesia Kendaraan Terminal Tbk. (IPCC)	2018	1,400294836
		2019	5,211822315
		2020	0,545597383
		2021	0,749523340
9	PT Jasa Armada Indonesia Tbk. (IPCM)	2018	1,300362608
		2019	1,135142112
		2020	0,949219856
		2021	1,144710334
10	PT Blue Bird Tbk. (BIRD)	2018	0,463098808
		2019	0,288654321
		2020	0,329864216
		2021	0,270678700
11	PT Eka Sari Lorena Transport Tbk. (LRNA)	2018	0,433785623
		2019	0,245774842
		2020	0,512515691
		2021	0,386934476
12	PT Express Trasindo Utama Tbk. (TAXI)	2018	0,961114189
		2019	- 0,259886847
		2020	- 1,792185674
		2021	8,101188051
13	PT Weha Transportasi Indonesia Tbk. (WEHA)	2018	- 0,060795979
		2019	0,021008403
		2020	0,545173143
		2021	0,086885541
14	PT Armada Berjaya Trans Tbk. (JAYA)	2018	0,110354506
		2019	0,094202507
		2020	0,403811034
		2021	0,879881428
15	PT Pelayaran Nelly Dwi Putri Tbk. (NELY)	2018	0,865301028
		2019	0,753567618
		2020	0,691447034
		2021	0,606079610
16	PT Samudera Indonesia Tbk. (SMDR)	2018	0,181469813
		2019	0,568186185
		2020	0,221515018
		2021	0,908498182

Determining Springate and Grover Method Cut-Off point

A. Springate

The Springate method only divides the cut-off point into two parts, namely:

S - Score > 0.862 the company is in good health.

S - Score < 0.862 the company is in a state of potential bankruptcy.

Based on the determination of the cut-off point above, the potential bankruptcy of industrial companies in the transportation sub-sector for the 2018-2021 period can be analyzed with the table 4.3 results:

B. Grover

Grover's method divides the cut-off point into two parts, namely:

S - Score \geq 0.01 the company is in good health.

S - Score \leq - 0.02 the company is in a state of potential bankruptcy.

Based on the determination of the cut-off point above, the potential bankruptcy of transportation companies for the 2018-2021 period can be analyzed based on the results of the Grover method, with the following results in table 4.3 below:

Table 4.3 Comparison of Bankruptcy Methods for Each Company in the Transportation

Sector

No	Code	Method	Potential Bankruptcy			
			2018	2019	2020	2021
1	PT Humpus Intermodal Transport Tbk. (HITS)	Springate	Bankrupt	Bankrupt	Bankrupt	Bankrupt
		Grover	Healthy	Healthy	Bankrupt	Healthy
2	PT Sillo Maritime Perdana Tbk. (SHIP)	Springate	Bankrupt	Bankrupt	Bankrupt	Bankrupt
		Grover	Healthy	Healthy	Healthy	Healthy
3	PT National Shipping Bina Buana Raya Tbk. (BBRM)	Springate	Healthy	Bankrupt	Healthy	Bankrupt
		Grover	Healthy	Healthy	Healthy	Bankrupt
4	PT Batulicin Nusantara Maritim Tbk. (BESS)	Springate	Healthy	Bankrupt	Bankrupt	Healthy
		Grover	Healthy	Bankrupt	Healthy	Healthy
5	PT Pelita Samudera Shipping Tbk. (PSSI)	Springate	Healthy	Bankrupt	Bankrupt	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
6	PT Transcoal Pacific Tbk. (TCPI)	Springate	Healthy	Bankrupt	Bankrupt	Bankrupt
		Grover	Healthy	Healthy	Healthy	Healthy
7	PT Pelayaran Tamrin Samudra Tbk. (TAMU)	Springate	Bankrupt	Bankrupt	Bankrupt	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
8	PT Indonesia Vehicle Terminal Tbk. (IPCC)	Springate	Healthy	Healthy	Bankrupt	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
9	PT Jasa Armada Indonesia Tbk. (IPCM)	Springate	Healthy	Healthy	Healthy	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
10	PT Blue Bird Tbk. (BIRD)	Springate	Healthy	Bankrupt	Bankrupt	Bankrupt
		Grover	Healthy	Healthy	Healthy	Healthy

11	PT Eka Sari Lorena Transport Tbk. (LRNA)	Springate	Healthy	Bankrupt	Healthy	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
12	PT Express Trasindo Utama Tbk. (TAXI)	Springate	Healthy	Bankrupt	Bankrupt	Healthy
		Grover	Healthy	Bankrupt	Bankrupt	Healthy
13	PT Weha Transportation Indonesia Tbk. (WEHA)	Springate	Bankrupt	Bankrupt	Healthy	Bankrupt
		Grover	Bankrupt	Healthy	Healthy	Healthy
14	PT Armada Berjaya Trans (Jaya)	Springate	Bankrupt	Bankrupt	Bankrupt	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
15	PT Pelayaran Nelly Dwi Putri Tbk. (NELLY)	Springate	Healthy	Healthy	Healthy	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy
16	PT Samudera Indonesia Tbk. (SMDR)	Springate	Bankrupt	Healthy	Bankrupt	Healthy
		Grover	Healthy	Healthy	Healthy	Healthy

5. Conclusion

There is a difference in accuracy between the Springate method and the Grover method in analyzing the bankruptcy of transportation sector companies listed on the Indonesian Sharia Stock Index before and during Covid-19. The results of the analysis of bankruptcy predictions for companies in the transportation sector using the Springate method Before Covid-19, there were 6 companies that were predicted to experience bankruptcy in 2018 and 12 companies in 2019. Meanwhile, companies that were healthy were 10 companies in 2018 and 4 companies in 2019. During Covid-19, it was predicted that there would be 11 companies have the potential to experience bankruptcy in 2020 and 6 companies in 2021. Meanwhile, there are 5 companies that are declared healthy in 2020 and 10 companies in 2021. The results of the analysis of bankruptcy predictions for companies in the transportation sector, Grover's method, are Before Covid-19, there was 1 company that was predicted to experience bankruptcy in 2018 and 2 companies in 2019. Meanwhile, companies that were healthy were 15 companies in 2018 and 14 companies in 2019. During Covid-19, it was predicted that there would be 2 companies have the potential to experience bankruptcy in 2020 and 1 company in 2021. Meanwhile, there are 14 companies that are declared healthy in 2020 and 15 companies in 2021.

Based on the results of the comparison between the two bankruptcy prediction methods, it shows that the Springate method predicts that 35 companies are declared to have the potential to experience bankruptcy and 29 companies are declared to be in good health or do not have the potential to experience bankruptcy. Meanwhile, the Grover Method predicts that there are 6 companies that have the potential to go bankrupt and 58 companies that are in good health or do not have the potential to go bankrupt. It can be concluded that Grover's method is considered the most accurate and optimal in this research because it approaches the reality of companies currently experiencing financial difficulties, namely five companies. Therefore, Grover's method is the most accurate and optimal for predicting the level of bankruptcy in transportation sector industrial companies listed on the Indonesian Sharia Stock Index for the 2018-2021 period.

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