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Analysis of Financial Distress with Springate and Method of Grover in Coal In BEI 2012 - 2016

Agnes Gracia Devina Hungan✉, Ni Nyoman Sawitri

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Universitas Trilogi, Indonesia

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Abstract

The coal industry is one of the largest contributors to the state budget of more than 40 billion annually, so the declining coal industry and the condition of every coal company in Indonesia are of particular concern to the government. This study examines how the level of financial distress of coal mining companies IDX 2012 - 2016 when analyst with Springate method and Grover method, and which method is most appropriate in predicting financial distress in coal companies. From the results of the calculation with the both methods are Obtained results there are some coal companies are declared to have financial distress with both methods and obtained the result that the Grover method is the most appropriate methods in predicting financial distress.

✉ Address Correspondence:
E-mail: gratiagnes@gmail.com

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INTRODUCTION

Boom commodity era of the 2000s resulted in a significant advantage for companies engaged in the export of coal. The increase in commodity prices mostly fueled by economic growth in developing countries. Nevertheless, the favorable situation changed when the global financial crisis in 2008 when commodity prices decline so quickly. Indonesia affected by these external factors for export commodities (especially for coal and palm oil) are responsible for about 50% of Indonesia's total exports, thus limiting the growth of GDP in 2009 to 4.6% (that can be said is still quite good, mainly supported by domestic consumption). In the 2nd half of 2009 until early 2011, global coal prices rebounded sharply. Although like that, the decline in global economic activity has reduced demand for coal, thus causing a decrease in coal prices that start from the beginning of 2011.

Table 1. Coal Reference Price List (HBA) in Indonesia

Months	2012	2013	2014	2015	2016
January	$ 109.29	$ 87.55	$ 81.90	$ 63.84	$ 53.20
in February	$ 111.58	$ 88.35	$ 80.44	$ 62.92	$ 50.92
March	$ 112.87	$ 90.09	$ 77.01	$ 67.76	$51.62
April	$ 105.61	$ 88.56	$ 74.81	$ 64.48	$ 52.32
May	$ 102.12	$ 85.33	$ 73.60	$ 61.08	$ 51.20
June	$ 96.65	$ 84.87	$ 73.64	$ 59.59	$ 51.81
July	$ 87.56	$ 81.69	$ 72.45	$ 78.95	$ 53.00
August	$ 84.65	$ 76.70	$ 70.29	$ 59.14	$ 58.37
September	$ 86.21	$ 76.89	$ 69.69	$ 58.21	$ 63.93
October	$ 86.04	$ 76.61	$ 67.26	$ 57.39	$ 69.07
November	$ 81.44	$ 78.13	$ 65.70	$ 54.43	$ 84.89
December	$ 81.75	$ 80.31	$ 64.65	$ 53.51	$ 101.69

Global economy crysis that occurred in 2015 give the greatest impact on the company in the field of mining and plantation companies. Even the world's largest private coal PT. Peabody Energy filed for bankruptcy protection in 2014 due to falling prices and demand for coal, which began in 2011. In Indonesia as many as approximately 125 coal mines in Kalimantan is not operating as of August 2015. As a result, 5,000 people affected by layoffs (PHK). Some of coal companies that listed on the Stock Exchange also experienced the same thing seen from minus profit by the company.

Table 2. Net Income Tables List of Coal Companies in the Stock Exchange in 2012-2016

Company	2012	2013	2014	2015	2016
Adaro Energy Tbk	383.307	229.263	183.244	151.003	340.686
Atlas Resources Tbk	(11.150)	(10.625)	(24.618)	(25.922)	(25.482)
Bara Jaya Internasional Tbk	(16.740.643)	13.040.702	52.011.645	(161.555.929)	(288.021.991)
Baramulti Suksessarana Tbk	9.783.589	4.734.891	2.544.925	26.376.125	27.421.577
Bumi Resources Tbk	(705.626.038)	(660.103.477)	(448.409.910)	(2.185.480.487)	120.255.710
Bayan					

Company	2012	2013	2014	2015	2016
Resources Tbk	54.946.917	(55.216.028)	(189.017.198)	(81.798.054)	18.015.433
Darma Henwa Tbk	(41.424.551)	(51.744.184)	83.066	465.754	549.890
Delta Dunia Makmur Tbk	(15.255.620)	(29.369.973)	16.305.961	(8.306.595)	37.089.185
Golden Energy Mines Tbk	178.934.525.099	170.268.433.795	10.818.904	2.088.781	34.988.248
Harum Energy Tbk	161.670.125	49.580.100	2.628.331	(18.996.829)	17.979.743
Indo Tambangraya Megah Tbk	432.043	230.484	200.971	63.107	130.709
Resource Alam Indonesia Tbk	23.589.823	17.240.350	8.006.072	5.672.213	9.472.864
Myoh Technology Tbk	36.149.791	173.784.084	22.580.872	24.732.565	21.258.922
Perdana Karya Perkasa Tambang	(9.064.094)	333.679	(26.919.603)	(61.713.327)	(13.670.278)
Batubara Bukit Asam (Persero) Tbk	2.909.421	1.854.281	2.019.214	2.037.111	2.024.405
Petrosea Tbk	49.122	17.308	2.356	(12.691)	(7.825)
Golden Eagle Energy Tbk	15.119.883.204	19.337.808.450	(3.502.096.211)	(60.578.867.106)	(18.281.061.731)
Toba Bara Sejahtra Tbk	11.932.682	34.603.793	35.548.674	25.724.095	14.586.772

As for the coal industry is one of the biggest contributors to the state budget are about more than 40 billion each year, so the decline of the coal industry and conditions of each coal company in Indonesia is of particular concern for the government. Therefore it is necessary analysis on the condition of the company - a coal company in Indonesia whether the company in good health condition or in a state of distress.

Previous research in predicting financial distress is Ni Made and Maria (2013) in his research "Predicted bankruptcy with Model Grover, Altman Zscore, Springate, and Zmijewski in Food and Beverage in Indonesia Stock Exchange", the research results are Model Grover is a predictor of bankruptcy most suitable applied to the Food & Beverage companies listed on the Stock Exchange. Evi, Prihanthini and Sari (2013) in his study "Comparing Prediction Method Method Financial Distrees The Variable", the results of research is there is a difference between the models grover denan Altman Z-Score model with springate and models grover grover with Zmijewski models. Grover and the model is the most suitable prediction model is applied to thecompany Food and Beverage because this model has the highest level of accuracy than other models in the amount of 100%, 80% Altman model, the model springate 90%, and by 90% Zmijewski models. Vahdat and Mohammad (2012) in his study "The Creation Of Bankruptcy Prediction Model Using Springate and SAF Models", his research is Springate with MDA

provides bankruptcy prediction with accuracy rate of 90% within 1 year prior to bankruptcy, and 82% in the period 2 years. While the SAF models by logistic regression analysis predicting bankruptcy with the accuracy of 88.5% off for a period of 1 year prior to bankruptcy and 79% for a period of 2 yrs before bankruptcy.

There are a variety of analysis tools bankruptcy that have been found, but the bankruptcy analysis tool that is widely used is the analysis of Springate models, and models Grover. The second reason is that analysis tools are widely used for the analysis of both devices have a fairly high level of accuracy in predicting the potential bankruptcy of a company.

METHODS

The population in this study are companies in the coal industry listed on the Stock Exchange in 2012 - 2016. The data selection method is purposive sampling and the number of samples contained in this study as many as 18 companies. The data used in this research is secondary data obtained from the official website of the Stock Exchange in the form of annual financial statements (audited) by accessing the website www.idx.co.id.The variables used in this study is a variable in the analysis method Springate and methods Grover, namely:

a. Method Springate
1) Working Capital to Total Assets Ratio
2) Earning Power Of Total Investment Ratio
3) Net Profit Before Tax To Current Liabilities Ratio
4) Total Asset Turn Over

b. Method Grover
1) Working Capital to Total asset Ratio
2) Earning Power of Total Investment Ratio
3) Return on assets

Secondary data analysis methods were used to analyze the report - compiled financial statements related to the company - the studied company will use the formula for calculating each - each method

1. Springate Model

$$S = 1.03A + 3.07B + 0.66C + 0.4D$$

Description:

A = working capital / total assets

B = net profit before interest and taxes / total assets

C = net profit before taxes / current liabilities

S = sales / total assets

2. Grover Model

$$Score = 1.650X_1 + 3.404X_3 + 0.016ROA + 0.057$$

Description:

X_1 = working capital / total assets

X_3 = earnings before interest and taxes / total assets

ROA = net income / total assets

RESULTS AND DISCUSSION

Analysis Springate method

Model Springate using four financial ratios to predict their potential in a company's financial difficulties. Springate models can be used to predict bankruptcy with keakurat value of 92.5%. If he scores S> 0,862 classified the company is healthy and if the score S <0,862, the company classified as potentially bankrupt. Springate analysis calculation shown in the following Table 3.

Table 3. Analysis Methods Springate

Kode Perusahaan	S Score 2012		S Score 2013		S Score 2014		S Score 2015		S Score 2016	
ADRO	1,55	health area	1,20	health area	1,09	health area	1,23	health area	1,47	health area
ARII	(0,07)	financial distress	(0,14)	financial distress	(0,41)	financial distress	(0,52)	financial distress	(0,60)	financial distress
ATPK	1,42	health area	0,42	financial distress	1,08	health area	(0,57)	financial distress	(1,38)	financial distress
BSSR	1,60	health area	1,09	health area	1,55	health area	2,60	health area	2,49	health area

Kode Perusahaan	S Score 2012		S Score 2013		S Score 2014		S Score 2015		S Score 2016	
BUMI	0,37	financial distress	0,05	financial distress	(0,86)	financial distress	(1,80)	financial distress	(0,07)	financial distress
BYAN	0,97	health area	0,71	health area	0,24	financial distress	0,31	financial distress	1,43	health area
DEWA	0,46	financial distress	0,10	financial distress	0,88	health area	0,83	health area	0,78	health area
DOID	0,89	health area	0,77	health area	1,22	health area	1,02	health area	1,25	health area
GEMS	2,13	health area	1,74	health area	2,33	health area	1,62	health area	2,69	health area
HRUM	4,94	health area	3,29	health area	1,82	health area	0,74	health area	1,77	health area
ITMG	3,84	health area	3,05	health area	2,52	health area	2,19	health area	2,46	health area
KKGI	11,52	health area	9,08	health area	2,18	health area	2,13	health area	2,99	health area
MYOH	1,77	health area	2,20	health area	2,71	health area	2,88	health area	3,48	health area
PKPK	0,91	health area	0,85	health area	0,11	financial distress	(0,95)	financial distress	(0,38)	financial distress
PTBA	4,06	health area	2,71	health area	2,15	health area	1,77	health area	1,71	health area
PTRO	1,52	health area	1,25	health area	1,23	health area	0,57	financial distress	0,39	financial distress
SMMT	0,83	health area	0,83	health area	0,03	financial distress	(0,38)	financial distress	(0,22)	financial distress
TOBA	1,72	health area	1,91	health area	2,61	health area	2,15	health area	1,54	health area

Springate method was able to predict in 2012 there were 3 companies classified as financial distress and 15 companies classified health. In 2013 there were four companies classified as financial distress and 14 companies classified health. In 2014 there were five companies classified as financial distress and 13 companies classified health. In 2015, there were 7 companies classified as financial distress and 11 companies classified health. In 2016 there were six companies classified as financial distress and 12 companies classified health.

Over the past 5 years in a row - there are two companies that participated row - has declared financial distress from 2012 till 2016, namely Atlas Resources and Bumi Resources. In this method, the smaller the value S score the worse the condition of the company, both companies are experiencing financial distress respectively - helped by the condition has a value of working capital and net profit before tax certainly has a negative value. A ratio of working capital to total assets and C net profit before tax to current liabilities ratio also has a negative value. This shows that at the time the company had working capital and a small profit before tax would cause the company to experience financial distress based on the calculation formula Springate.

Analysis Grover Model

Grover Model categorizes companies into insolvency if it obtained a score of less than or equal to -0.02 (-0.02 Z) and the company is said to have the potential bankrupt if obtained a score greater than or equal to 0.01 (Z 0, 01). Grover analysis calculations are shown in the following Table 4.

Table 4. Analysis Methods Grover

Kode Perusahaan	X Score 2012		X Score 2013		X Score 2014		X Score 2015		X Score 2016	
ADRO	0,66	health area	0,60	health area	0,53	health area	0,62	health area	0,82	health area
ARII	(0,99)	financial distress	4,01	health area	2,40	health area	2,88	health area	2,20	health area
ATPK	(0,94)	financial distress	0,44	health area	0,68	health area	2,24	health area	2,26	health area
BSSR	0,77	health area	0,19	health area	0,22	health area	0,75	health area	0,80	health area
BUMI	(0,62)	financial distress	(1,26)	financial distress	(1,72)	financial distress	(55,39)	financial distress	5,08	health area
BYAN	0,47	health area	(0,21)	financial distress	(2,03)	financial distress	(0,39)	financial distress	0,51	health area
DEWA	(10,63)	financial distress	4,92	health area	0,17	health area	0,16	health area	0,11	health area
DOID	0,10	health area	(0,04)	financial distress	0,46	health area	0,33	health area	0,50	health area
GEMS	0,82	health area	0,62	health area	0,78	health area	0,66	health area	1,01	health area
HRUM	1,52	health area	1,07	health area	0,68	health area	0,21	health area	0,95	health area
ITMG	1,44	health area	1,09	health area	0,91	health area	0,62	health area	0,92	health area
KKGI	3,38	health area	2,59	health area	0,73	health area	0,70	health area	0,94	health area
MYOH	0,30	health area	0,91	health area	1,06	health area	1,15	health area	1,27	health area
PKPK	0,05	health area	0,34	health area	5,23	health area	1,37	health area	4,54	health area
PTBA	1,51	health area	1,19	health area	1,04	health area	0,90	health area	0,87	health area
PTRO	0,72	health area	0,50	health area	0,33	health area	(0,25)	financial distress	(0,33)	financial distress
SMMT	2,15	health area	1,56	health area	(0,89)	financial distress	(272,36)	financial distress	(4,57)	financial distress
TOBA	0,30	health area	0,64	health area	0,77	health area	0,71	health area	0,47	health area

Grover method was able to predict that in 2012 there were 4 companies classified as financial distress and 14 companies classified health. In 2013 there were 3 companies classified as financial distress and 15 companies classified health. In 2014 there were 3 companies classified as financial distress and 15 companies classified health. In 2015 there were four companies classified as financial distress and 14 companies classified health. In 2016 there were two companies classified as financial distress and 16 companies classified health.

Over the past 5 years in a row - succession there are companies that respectively - has declared financial distress from years 2012 to 2016. In this method, the smaller the value of X score the worse the condition of the company, from several companies experiencing financial distress in each year have conditions definitely worth the value of negative net income. The ratio of return on assets also have a negative value. This shows that when the company has a return on assets of small value will cause the company to experience financial distress based on the calculation formula grover.

Accuracy and Error Rate Test

Table 5. Summary of The Average Results of Financial Distress Coal Company on the Stock Exchange 2012 - 2016

Company Code	Springate Method		MethodGrover	
ADRO	1.31	health area	0.64	health area
ARII	(0.35)	financial distress	2.10	area health
ATPK	0,19	financial distress	0,94	health area
BSSR	1,87	health area	0.55	health area
EARTH	(0.46)	financial distress	(10.78)	financial distress
BYAN	0.73	area of health	(0.33)	financial distress
DEWA	0.61	financial distress	(1.05)	financial distress
DOID	1.03	health area	0,27	health area
GEMS	2,10	area health	0,78	healtharea
HRUM	2.51	healtharea	0,89	health area
ITMG	2,81	health area	0,99	health area
KKGI	5.58	health area	1.67	healtharea
MYOH	2.61	health area	0.94	health area
PKPK	0.11	financial distress	2, 30	health area
PTBA	2,48	health area	1,10	health area
PTRO	0,99	health area	0.19	health area
SMMT	0.22	financial distress	(54.82)	financial distress
TOBA	1.98	health area	0 , 58	health areas

Springate Model

From the comparison between the methods of prediction with the status of the sample companies using Springate, the results are as follows:

Table 6. Level of Accuracy and Level Error Method Springate

	Results Prediction Springate		Total
	Health Areas of	Financial Distress	
Total Company Listing	12	6	18
The level of accuracy of		67%	
Level Error		33%	

Source: Processed Data

Calculation:

$$\text{Level of Accuracy} = \frac{\text{Total True Prediction}}{\text{Total Sample}} x100\% = \frac{12}{18} x100\% = 67\%$$

$$\text{Level Error} = \frac{\text{Total Error}}{\text{Total Sample}} x100\% = \frac{6}{18} x100\% = 33\%$$

Based on the analysis performed on eighteen company Springate method has an accuracy rate of 67%. From table 4.9, the accuracy of prediction methods springate can be seen from the 12 companies that precise predictions, predictions springate account for 12 companies predict healthy and in fact did not experience delisting. For the results of error rates, springate method has an error rate of 33%, this figure can be seen from the 6 companies that predictions are not precise. Springate prediction takes into account 6 companies predicted distress or bankruptcy, and

there is in fact the company is not experiencing delisting.

Grover Model

From the comparison between the methods of prediction with the status of the sample companies using Grover in Table 7.

Table 7. Level of Accuracy and Level Error Grover Model

	Results Prediction Grover		Total
	Health Areas of	Financial Distress	
Total Company Listing	**14**	**4**	**18**
Level Accuracy		**78 %**	
rate of Error		**22%**	

Source: Processed Data

Calculation:

$$\text{Level of Accuracy} = \frac{\text{Total True Prediction}}{\text{Total Sample}} x100\% = \frac{14}{18} x100\% = 78\%$$

$$\text{Level Error} = \frac{\text{Total Error}}{\text{Total Sample}} x100\% = \frac{4}{18} x100\% = 22\%$$

based on analysis done at eighteen companies Grover method has an accuracy rate of 78%. From table 4.12 Grover accuracy of prediction methods can be seen from the 14 companies that prediction is right, Grover prediction takes into account 14 companies predict healthy and in fact did not experience delisting. For the results of error rates, methods Grover had an error rate of 22%, this figure can be seen from the four companies that predictions are not precise. Grover predictions take into account the four companies predicted distress or bankruptcy, and there is in fact the company is not experiencing delisting.

Table 8. Comparison of Accuracy of Springate Model and Grover Model Prediction

Method of Prediction	Accuracy Level	Level Error
Springate	67%	33%
Grover	78%	22%

The table can be seen comparing the results of the analysis using method Springate and Grover on coal company in Indonesia Stock Exchange. The highest accuracy grades are occupied by Grover method to value accuracy rate of 78% and an error rate of 22%, and the second position is occupied by Springate method to value accuracy rate of 67% and an error rate of 33%. This shows that the method of Grover is the most accurate method for analyzing financial distress. This is consistent with research Ni Made and Maria (2013) in his research "Predicted bankruptcy with Model Grover, Altman Zscore, Springate, and Zmijewski in Food and Beverage in Indonesia Stock Exchange", the research results are Model Grover is a predictor of bankruptcy that best suits applied to the Food & Beverage companies listed on the Stock Exchange. Evi, Prihanthini and Sari (2013) in his study "Comparing Prediction Method Method Financial Distrees The Variable", the results of research is there is a difference between the models grover denan Altman Z-Score model with springate and models grover grover with Zmijewski models. Grover and the model is the most suitable prediction model is applied to thecompany Food and Beverage because this model has the highest level of accuracy than other models in the amount of 100%, 80% Altman model, the model springate 90%, and by 90% Zmijewski models.

CONCLUSIONS

Springate method was able to predict in 2012 there were 3 companies classified as financial distress and 15 companies classified health. In 2013 there were four companies classified as financial distress and 14 companies classified health. In 2014 there were five companies classified as financial distress and 13 companies classified health. In 2015, there were 7 companies classified as financial

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Grover method is the most accurate method for predicting financial distress in the coal company with a value of 78% accuracy rate and an error rate of 22%, in the second position is occupied by Springate method to value accuracy rate of 67% and an error rate of 33%.

For management, may consider the results of the calculation method of Grover to minimize or avoid the risk of financial distress and forced the company delisted from the Indonesian Stock Exchange. For investors, may consider the use of calculations and financial ratios in Grover method to predict the likelihood of listed coal companies would have forced delisting, so that investors can make informed decisions in investing through the Indonesia Stock Exchange.

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