

Financial Distress Analysis And Accuracy Test With The Altman Model Approach, Springate And Zmijweskiin Automotif And Components Manufacturing Companies E Listed On The Idx In 2016–2020

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Abstract – — Problems of automotive and component companies on the IDX in 2016-2020 there are financial difficulties as a result of sales resulting in financial distress. The research objective is to determine financial potential distress using the Altman, Springate and Zmijweski models and testing accuracy on automotive and component companies listed on the IDX in 2016-2020. The research data comes from secondary data. Research population 13 and sample 60 data determined by purposive sampling. Data analysis using descriptive statistics. The results of the study (1) According to the Altman model, 2 companies experience financial distress, 2 are gray area companies and 8 are non-financial distress companies. (2) According to the Springate model, there are 7 financial distress companies and 5 non-distress financial companies. (3) According to the Zmijweski model 12 non-distress financial companies. (4) The Zmijweski model is the most accurate model for predicting financial distress because it has an accuracy rate of 100%, the Altman model has an accuracy rate of 66.7% and the Springate model has an accuracy rate of 41.7%

Keywords – financial distress and financial non-distress)

I. INTRODUCTION

Automotive and component companies, one of the sub-sectors of manufacturing industry companies listed on the Indonesia Stock Exchange (IDX), have had a significant impact on economic growth, in 2016-2018 sales were relatively stable except for 2019-2020, which fell due to the COVID-19 pandemic. At the beginning of 2020 Indonesia's economy slumped, the first quarter fell 2.05%, the second quarter fell -5.23%, the second quarter fell -3.49% and the fourth quarter fell -2.19 % so that there were financial difficulties due to the decline sales. All issuers of the automotive and component industries fell significantly in 2019-2020 because demand fell -7.03%. There are 2 issuers with good financial performance, namely PT Gajah Tunggal Tbk (GJTL) and PT Multistrada Arah Sarana Tbk (MASA) from 11 other issuers. In 2019 there were 13 issuers of automotive and

component companies, 11 of whose shares fell, 1 share strengthened and 1 share stagnated. The most depressed stock was PT Indo Kordsa Tbk (BRAM) -39.81% at Rp. 6,500/share. The strongest stock, namely PT. Multi Strada Arah Sarana Tbk (MASA) 4.35% for Rp. 480/share and 1 stagnant share, namely PT. Nipress Tbk (NIPS) priced at IDR 282/share. Net profit of automotive and component companies listed on the IDX 2016-2020 in each company decreased significantly.

Every company must monitor its financial condition in order to determine the bankruptcy of the company through analysis of financial statements. The financial statements describe the company's financial condition in the current period or certain periods [1]. Early indications of corporate bankruptcy need to be known by management so that corrective steps can be taken immediately [2]. The condition of the company during financial distress has negative net profit for more than 1 year, is unable to pay dividends and lays off employees [3]. Analysis of financial distress in automotive and component companies comparing the Altman model, Springate, Zmijweski and Grover, the results of the Springate model are 92.5% more accurate [4]. Model analysis comparison Altman, Zmijweski, Ohlson, Springate and Grover on the football club company, the results model Altman correctly predicts that there will be financial distress as many as 163 out of 182 samples [5] also analyze financial distress in Islamic companies, the results are the best Zmijweski model [6].

Problem Research how is the Altman model, Springate and Zmijweski analyze the potential for financial distress and test accuracy in automotive and component companies listed on the IDX in 2016-2020? The research objective is to determine financial potential distress using the Altman, Springate, Zmijweski models and accuracy tests on automotive and component companies listed on the IDX in 2016-2020.

Bankrupt companies are economic failures and financial failures [7]. Company Financial distress can be minimized by monitoring the income balance sheet and income statement using the Altman, Springate and Zmijweski models. Another term for bankruptcy is economic failure, business failure, technical insolvency and insolvency bankruptcy [8]. Altman Z model formulation = $6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$. Criteria $Z < 1.1$ bankrupt $1.1 < Z < 2.6$ gray area and $Z > 2.6$ not bankrupt [9]. The Springate S model formulation = $1.03 X_1 + 3.07 X_2 + 0.66 X_3 + 0.4 X_4$ 92.5% accuracy value. Criteria $S < 0.862$ bankrupt, $S > 0.862$ financially sound but not bankrupt [9]. The Zmijweski model formulation $Z = -4.3 - 4.5X_1 + 5.7X_2 - 0.004X_3$. Criterion $Z \geq 0$ bankrupt and $Z < 0$ is not bankrupt [9]. The level of accuracy is the result of a calculation according to the true value to show the correctness of measurement with an accepted value. The level of accuracy is calculated by: 1) Accuracy rate = (number of correct predictions / number of samples) x 100, 2) Type of error r or I = (number of wrong predictions / number of samples) x 100, c) Type of error r or II = (number of wrong predictions / number of samples) x 100 [10]

II. RESEARCH METHODS

The research method is a scientific way of discovery to obtain data with specific purposes and uses that are evidentiary or development [9]. Secondary research data was collected by documentation and literature [10]. Data analysis used descriptive statistics to find out the symptoms that arose when the research was conducted [10] in predicting the bankruptcy of the Altman, Springate and Zmijweski models with accuracy tests on automotive and component companies listed on the IDX in 2016-2020.

The object of research is the financial statements of automotive and component companies listed on the IDX in 2016-2020. The study population of 13 automotive and component companies listed on the IDX in 2016-2020 and *delisted* on the IDX are as follows: companies Astra International Tbk (ASII), Astra Otopart Tbk (AUTO), Garuda Metalindo Tbk (BOLT), Indo Kordsa Tbk and Branta Mulia Tbk (BRAM), Goodyear Indonesia Tbk (GDYR), Gajah Tunggal Tbk (GJTL), Indomobil Sukses International Tbk (IMAS), Indospring Tbk (INDS), Multi Prima Sejahtera Tbk and Lippo Enterprises Tbk (LPIN), Multistrada Arah Sarana Tbk (MASA), Nipress Tbk (NIPS), Prima Alloy Steel Universal Tbk (PRAS) and Selamat Sampurna Tbk (SMSM). A sample of 60 research data was determined by *purposive sampling* [9] because only 12 companies are active except the company Nipress Tbk (NIPS). First, confirm that you have the correct template for your paper size. This template has been tailored for output on the A4 paper size. If you are using US letter-sized paper, please close this file and download the file "MSW USltr_format".

III. RESULTS AND DISCUSSION

3.1. Descriptive Statistical Analysis

Descriptive statistics provide a description of the value minimum, maximum, average (mean) and standard deviation as in table 1

Table 1. Descriptive Statistics analysis

Variable	N	Minimum	Maximum	Means	Std. Deviation
WCTA	60	-0.2178	0.5619	0.1430	0.1971
RETA	60	-0.1802	0.6377	0.2548	0.2059
EBITTA	60	-0.1390	0.7015	0.0715	0.1152
BVEBVD	60	0.0017	14.0303	2.5957	3.0730
EBTCL	60	-0.3288	7.6125	0.5187	1.1269
STA	60	0.0025	1.4042	0.6973	0.3451
EATTA	60	-0.1340	0.7160	0.0493	0.1105
BVDTA	60	0.0665	0.8920	0.4215	0.2170
CACL	60	0.6016	13.0416	2.4892	2.3344
Valid N (Listwise)	60				

Source: Processed Data, 2022

3.2. Results of Data Analysis

3.2.1. Analysis Using the Altman Model

Equation $Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$ after analyzing the cut off $Z < 1.1$ financial distress because $1.1 < Z < 2.6$ gray area. Z value > 2.6 financial non distressed. The results of the analysis are as table 2.

Table 2. Results of Financial Distress Analysis Using the Altman Model

No.	CODE	2016	2017	2018	2019	2020	Average	Conclusion
1.	ASII	-1.9649	-1.9716	-1,845	-1.9702	-2.1474	-1.9798	Non-distressed
2.	AUTO	-2,865	-2.9281	-2.8393	-2.9824	-2.8283	-2.8886	Non-distressed
3.	BOLT	-3,578	-2.4209	-2.0724	-2.2177	-1.9413	-2.4460	Non-distressed
4.	BRAM	-2.7537	-3.0362	-3.1405	-3.3467	-3.0478	-3.0650	Non-distressed
5.	GYDR	-1.5123	-1.0384	-1.0812	-1.0372	-0.5333	-1.0405	Non-distressed
6.	GJTL	-0.5405	-0.4004	-0.2881	-0.5552	-0.8846	-0.5337	Non-distressed
7.	IMAS	-0.0408	-0.2803	-0.0507	0.1815	0.1463	-0.0088	Non-distressed
8.	INDS	-3.4606	-3.8521	-3.8599	-3.9572	-3.8888	-3.8037	Non-distressed
9.	LPIN	1.3848	-6.7637	-4.2908	-4.3873	-3.9563	-3.6027	Non-distressed
10.	TIME	-1.7235	-1.4694	-1.2955	-0.9644	-1.8371	-1.4580	Non-distressed
11.	PRAS	-1.0707	-1.0944	-1.019	-0.705	-0.3717	-0.8521	Non-distressed
12.	SMSM	-3.6081	-3.9028	-4,009	-4.0242	-3.8141	-3.8716	Non-distressed

Source: Processed Data, 2022

According to table 2, ASII companies are financially non-distressed because $Z > 2.6$ despite fluctuations. Company AUTO $Z > 2.6$ no financial distress. Bolt Company 2020 is a gray area due to $1.1 < Z < 2.6$ financial distress. A non-distress financial BRAM company because $Z > 2.6$. GDYR company in 2016, 2017 gray area due to $1.1 < Z < 2.6$ 2018-2020 financial distress due to $Z < 1.1$. GJTL company 2017-2019 gray area because $1.1 < Z < 2.6$ in 2016, 2020 financial non distress because $Z > 2.6$. IMAS companies in 2016-2020 are in financial distress because $Z < 1.1$. The INDS company is financially non-distress

because $Z > 2.6$. LPIN companies in 2016 financial distress because $Z < 1.1$ 2017-2020 financial distress because $Z > 2.6$. MASA company 2016-2020 gray area because $1.1 < Z < 2.6$. PRAS companies in 2016-2019 are in financial distress because $Z < 1.1$ and in 2020 are gray areas because $1.1 < Z < 2.6$. SMSM Company in 2016 – 2020 financial non distress because $Z > 2.6$. In conclusion, the condition of the company in 2016-2020 financially non-distress, there are 8 companies $Z > 2.6$, namely ASII, AUTO, BOLT, BRAM, INDS, LPIN and SMSM companies. There are 2 gray areas, namely GDYR and MASA companies because $1.1 < Z < 2.6$. There are 2 financial distress companies because $Z < 1.1$, namely companies IMAS and PRAS.

3.2.2. Analysis Using the Springate Model

Equation $S = 1.03 X_1 + 3.07 X_2 + 0.66 X_3 + 0.4 X_4$ after analyzing the cut off $S < 0.862$ financial distress and $S > 0.862$ financial non distressed the results of the analysis are as table 3.

Table 3. Results of Financial Distress Analysis Using the Springate Model

No.	CODE	2016	2017	2018	2019	2020	Average	Conclusion
1.	ASII	0.9525	1.0036	0.7591	0.8083	0.6331	0.8313	Distress
2.	AUTO	0.3424	0.3803	0.7229	0.8407	0.5288	0.563	Distress
3.	BOLT	1.8869	1.5757	1.0867	0.9994	0.2447	1.1587	Non-distressed
4.	BRAM	1.1836	1.3765	1.213	1.2881	0.36	1.0723	Non-distressed
5.	GYDR	0.5371	0.4571	0.3517	0.2866	0.1362	0.3537	Distress
6.	GJTL	0.8495	0.6517	0.5991	0.7183	0.7658	0.7169	Distress
7.	IMAS	0.2534	0.2512	0.1442	0.141	0.0406	0.1661	Distress
8.	INDS	0.7725	1.406	1.3991	1.2462	0.9231	1.1494	Non-distressed
9.	LPIN	-0.687	7.7456	1.9853	2.4774	0.9182	2.4879	Non-distressed
10.	TIME	0.1214	0.1413	0.0969	-0.3644	0.7625	0.2973	Distress
11.	PRAS	0.177	0.1427	0.1783	-0.1861	0.2601	0.1144	Distress
12.	SMSM	2.7342	3.0726	3,145	3.0521	2.7262	2,946	Non-distressed

Source: Processed Data, 2022

Calculations use the Springate model for 2016-2020 according to table 4 ASII companies in 2016, 2017 financial non distressed because $S > 0.862$ but in 2018-2020 financial stress is because $S < 0.862$. AUTO companies in 2016-2020 financial distress because $S < 0.862$. BOLT and BRAM companies in 2016-2019 financial non distress because $S > 0.862$ but in 2020 financial distress because $S < 0.862$. GDYR, GJTL, IMAS, MASA and PRAS companies in 2016-2020 financial distress because $S < 0.862$. LPIN company in 2016 financial distress because $S < 0.862$ but in 2017-2020 financial non distress because $S > 0.862$. SMSM financial company non distressed because $S > 0.862$. In conclusion, in 2016-2020 there were 5 non - distress financial companies and 7 non - distress financial companies.

3.2.3. Analysis Using the Zmijweski Model

$-4.3 - 4.5X_1 + 5.7X_2 - 0.004X_3$ after analyzing the cut off $Z > 0$ financial distress and $Z < 0$ financial distress with the results of the analysis shown in Table 4.

Table 4. Results of Financial Distress Analysis Using the Zmijweski Model

No.	CODE	2016	2017	2018	2019	2020	Average	Conclusion
1.	ASII	-1.9649	-1.9716	-1,845	-1.9702	-2.1474	-1.9798	Non-distressed
2.	AUTO	-2,865	-2.9281	-2.8393	-2.9824	-2.8283	-2.8886	Non-distressed
3.	BOLT	-3,578	-2.4209	-2.0724	-2.2177	-1.9413	-2.4460	Non-distressed
4.	BRAM	-2.7537	-3.0362	-3.1405	-3.3467	-3.0478	-3.0650	Non-distressed
5.	GYDR	-1.5123	-1.0384	-1.0812	-1.0372	-0.5333	-1.0405	Non-distressed
6.	GJTL	-0.5405	-0.4004	-0.2881	-0.5552	-0.8846	-0.5337	Non-distressed
7.	IMAS	-0.0408	-0.2803	-0.0507	0.1815	0.1463	-0.0088	Non-distressed

8.	INDS	-3.4606	-3.8521	-3.8599	-3.9572	-3.8888	-3.8037	Non-distressed
9.	LPIN	1.3848	-6.7637	-4.2908	-4.3873	-3.9563	-3.6027	Non-distressed
10.	TIME	-1.7235	-1.4694	-1.2955	-0.9644	-1.8371	-1.4580	Non-distressed
11.	PRAS	-1.0707	-1.0944	-1.019	-0.705	-0.3717	-0.8521	Non-distressed
12.	SMSM	-3.6081	-3.9028	-4,009	-4.0242	-3.8141	-3.8716	Non-distressed

Source: Processed Data, 2022

According to table 4 for 2016-2020 the companies ASII, AUTO, BOLT, BRAM, GDYR, GJTL, INDS, MASA, PRAS, SMSMin 2016-2020 financial n ondistressbut IMAS companies in 2016-2018 financial distressand in 2019, 2020 financial distress because $Z > 0$. LPIN companies in 2016 financial distress because $Z > 0$. In 2017-2020 non-financial companies distress. In conclusion, in 2016-2020 all non-financial companies distress.

3.2.4. Model Accuracy Rate and Error Type

The results of the calculation of the accuracy test using the Altman, Springate and Zmijweski models for 12 automotive and component companies are shown in table 5.

Table 5. Table 5 . Calculation results of Accuracy Level and Type of Error

Predictions	Altman	Springate	Zmijweski
Bankrupt	2	7	0
Not Bankrupt	8	5	12
Gray Area Zone	2	-	-
Total Sample	12	12	12
Level of accuracy	66,7	41.7	100
Type Err or 1	16.65	58,3	0
Type Err or 2	16.65	0	0

Source: Processed data, 2022

According to table 5, the Spring model has an accuracy rate of 41.7%, the value of type error I is 58.3%, the Altman model has an accuracy rate of 66.7%, the value of type errors I and II is 16.65 % and the Zmijweskimodel has an accuracy rate of 100 % value type err or 0%. In conclusionthe Zmijweski model is the most accurate model for predicting financial distress in automotive and component companies listed on the IDX in 2016–2020.The results of the prediction of financial distress using the Altman, Springate and Zmijweski models show that in 2021 not a single company will go bankrupt, but there will be companies that will experience minus net profits, as experienced by IMAS companies.

IV. CONCLUSION

Based on the results of the research, the following conclusions can be drawn:

1. According to Altman's model, IMAS and PRAS companies are financial distress and GDYR companies, MASA gray area. ASII, AUTO, BOLT, BRAM, GJTL, INDS, LPIN and SMSM financial non distress companies .
2. According to the company's Springate model ASII, AUTO, GDYR, GJTL, IMAS, MASA and PRAS financial distress. BOLT, BRAM, INDS, LPIN and SMSM financial non distress companies
3. According to the Zmijweski model, there are no financial distress companies, meaning that all financial companies are non-distress.
4. The Zmijweski model has the highest level of accuracy of the three models used, the accuracy rate is 100% so that the best financial distress analysis uses the Zmijweski model.

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CONFLICT OF INTEREST

Our research team declares that there is no conflict of interest related to the results of this study.

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