PREDICTION OF FINANCIAL DISTRESS IN THE AUTOMOTIVE COMPONENT INDUSTRY: AN APPLICATION OF ALTMAN, SPRINGATE, OHLSON, AND ZMIJEWSKI MODELS

Hendra Pratama[1], Bambang Mulyana[2]
[1] Postgraduate Universitas Mercu Buana, Jakarta, Indonesia
[2] Doctoral Universitas Mercu Buana, Jakarta, Indonesia

Abstract: This study aims to identify and examine the condition of financial distress in the automotive component industry issuers in the period 2014 ~ 2018, using the Altman Z-score, Springate S-score, Ohlson O-score, and Zmijewski X-score against financial ratios as an analysis form of company management to predict the early warnings of company bankruptcy. This study uses quantitative, secondary, and panel data; while the sample uses a non-probability boring sampling technique of 11 companies. The results showed that these four models can predict financial distress by identifying each model. Altman's model found 8 distress zone points, 16 grey zone points, and 31 safe zone points. Springate's model found 37 points in the distress zone, and 18 points in the safe zone. Ohlson's model found 3 points in the distress zone, and 52 points in the safe zone. Zmijewski's model found only 1 point in the distress zone.

Keywords: Financial Distress, Prediction Models, Financial Ratios, Manufacturing Company.

INTRODUCTION

Financial distress and bankruptcy are two topics that are always interesting to be discussed in the financial research sector. The research will be even more interesting if carried out on industries that are growing rapidly or on supporting industries of these major industries because financial distress or bankruptcy can be caused by internal and external factors. The automotive industry is one of the fast-growing industrial sectors in Indonesia and has made a major contribution to the national economy. This development is also supported by changes in the outlook of consumers who view vehicles are no longer luxury goods but become a necessity to support community activities. The development of motor vehicle sales in Indonesia is shown in figure 1.
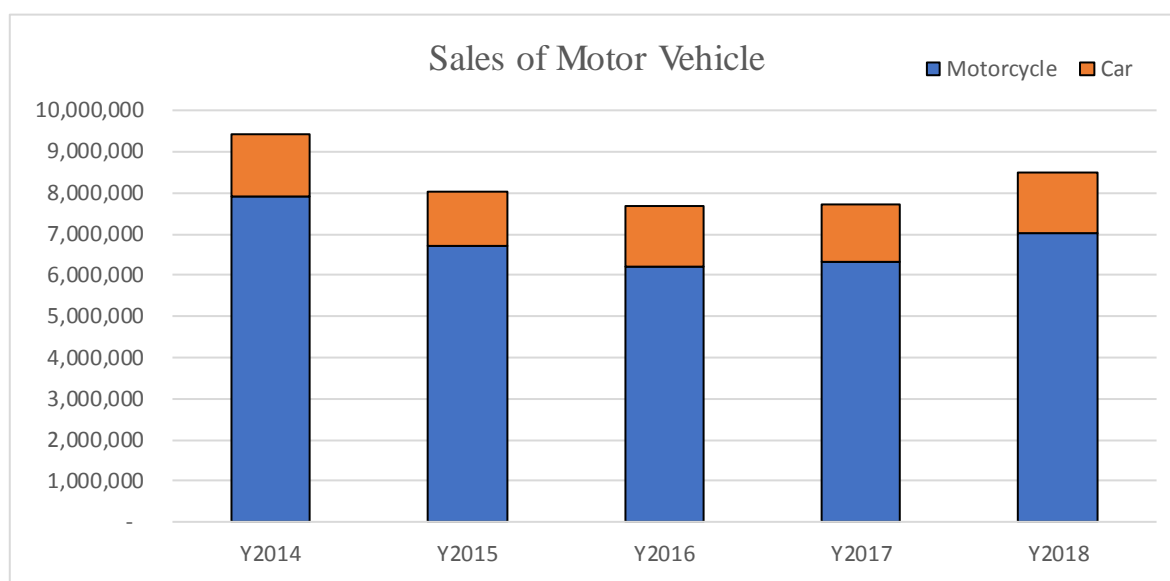
numbers in units

Description	Y2014	Y2015	Y2016	Y2017	Y2018
Car - Domestic	1,208,028	1,013,518	1,062,694	1,077,365	1,151,284
Car - Export	310,853	316,461	397,023	316,538	346,581
Car - Sales	**1,518,881**	**1,329,979**	**1,459,717**	**1,393,903**	**1,497,865**
M.cycle - Domestic	7,867,195	6,480,155	5,931,285	5,886,103	6,383,108
M.cycle - Export	41,746	228,229	284,065	434,691	627,421
Motorcycle - Sales	**7,908,941**	**6,708,384**	**6,215,350**	**6,320,794**	**7,010,529**

Source: Association of Indonesian Motor Vehicle Industry (Gaikindo)

Association of Indonesian Motorcycle Industry (AISI)

Figure 1. Motor vehicle sales in Indonesia.

The development of sales in the automotive industry certainly has a positive impact on the component industry. Around 70% of automotive components are supplied for OEM needs and the rest are for aftermarket needs. The large absorptive capacity of the automotive industry towards the component industry, making the component industry has a captive market and should be free from the possibility of financial distress, especially bankruptcy. Based on the background above, it is interesting to research whether there is financial distress or even bankruptcy in the automotive component industry.

LITERATURE REVIEW

Financial distress is defined as the company's inability to pay its financial obligations as they should. Financial distress can occur and have various forms of appearance (Beaver 1996 in Beaver et al, 2011). Beaver said that the condition of a company's financial distress generally refers to the inability to pay obligations when due. Then in 1968, Altman continued his studies to explore the bankruptcy of companies using discriminant analysis and also used several financial ratios (Altman 1968 in Altman et al, 2013). Research on financial distress prediction has also been carried out and almost all of them bring discussion about the Altman model, such as research conducted by Mulyana and Asysyukur (2017), in which this study

analyzes bankruptcy in coal mining issuers in Indonesia for the period 2012 ~ 2016. The bankruptcy development idea is presented in Figure 3 below.
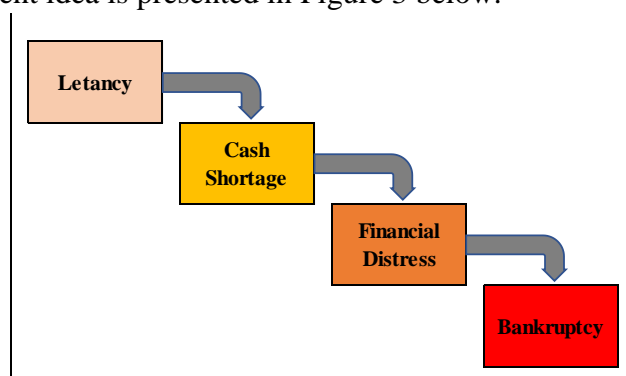

Figure 2. Stage of Bankruptcy

Financial distress and bankruptcy are different (Platt and Platt, 2006). A company is said to be bankrupt if the company completely stops operating. Several factors cause companies to experience financial distress or even bankruptcy. Financial distress is one of the stages before a company is declared bankrupt. This stage was stated by Kordestani, Biglari, Bakhtiari (2011: 278). In Figure 2. It can be noted that the initial step towards bankruptcy is Latency, which is a condition where the ratio of return of assets (ROA) begins to decrease. The second stage is Cash Shortage, where companies begin to experience a condition of lack of cash in financing their operational costs. Then is the stage of Financial Distress, where the conditions of financial distress have been experienced by the company, and if it cannot be overcome will have an impact on Bankruptcy. The purpose of this study is to identify and examine the condition of financial distress with a framework below.
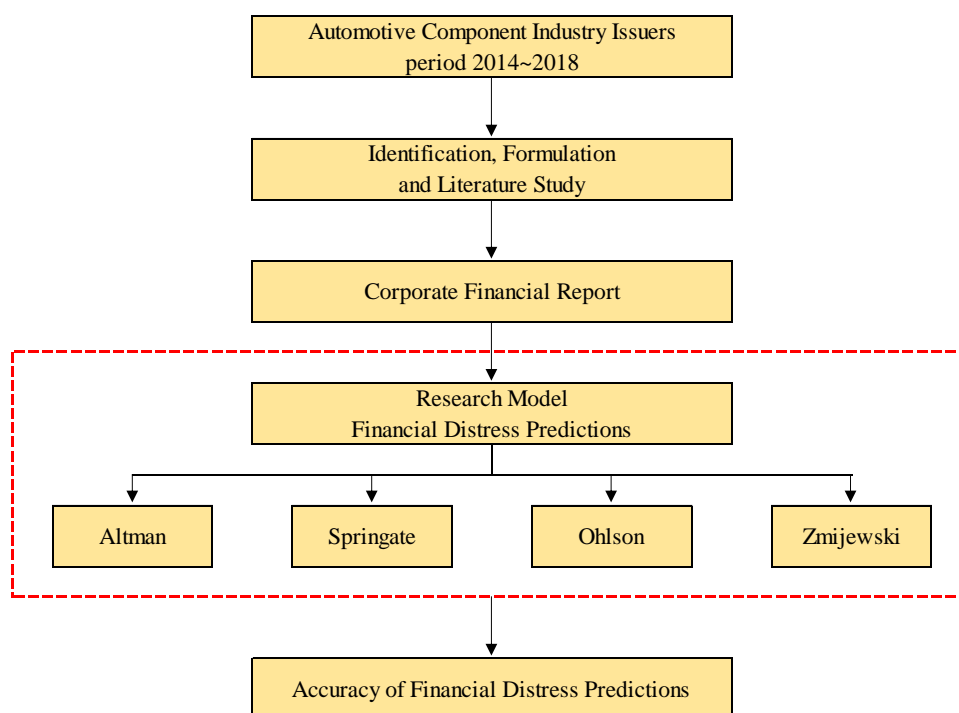

Figure 3. Framework

RESEARCH METHODS

This study uses a descriptive design to explore the possibility of bankruptcy of companies using financial ratios proposed by Altman, Springate, Ohlson, and Zmijewski. The operational variable definitions in Figure 4. used in this study is the financial ratios that are managed from the company's financial statements, are as follows:

1. WCTA (Working Capital / Total Assets)
   WCTA is operationally defined as a number resulting from the comparison between working capital and total assets. This liquidity ratio shows the company's ability to generate net working capital from its total assets. The higher the value of the WCTA ratio, the more it states the company is in a liquid condition and shows the better financial performance of the company. Where the net working capital owned by the company is expected to finance the company's operational activities.

2. RETA (Retained Earnings / Total Assets)
   RETA is a value that shows the comparison of a company's ability to obtain profits derived from the distribution of retained earnings and total assets. The higher the ratio value shows the positive operational performance of the company which is expected to increase the accumulated retained earnings of the company's total assets.

3. EBITTA (EBIT / Total Assets)
   A value of which shows the company's ability to generate profits from company assets, before payment of interest and taxes obtained from the results of the distribution of income before interest and taxes and total assets. Figures obtained from this ratio indicate, the more effective and efficient management of corporate finances if the value of this ratio is higher.

4. BVEBVD (Book Value of Equity / Book Value of Total Debts)
   A value of the ratio that shows the amount of equity ratio that can be distributed to shareholders to the total amount of the company's debt. Or in other words, the ratio of net equity value after all company assets are sold and used to pay off the company's debt to the amount of debt itself. The total Book value of equity is also known as shareholder's equity.

5. EBTCL (EBT / Total Current Liabilities)
   A value that represents a guarantee of the liability of the company's assets that matures in one operating period, before tax payments obtained from the income from that period.

6. SATA (Sales / Total assets)
   A value that indicates the extent to which a company uses its assets effectively to increase sales obtained from the distribution of sales and total assets.

7. NITA (EAT / Total Assets)
   A profitability value that measures how efficiently a company can manage its assets to generate profits for a period.

8. TLTA (Total Liabilities / Total Assets)
   Solvency ratio which states the level of leverage of a company. In other words, the ratio is an indicator of the proportion of company assets financed by debt/creditors. The higher the level of leverage, the higher the potential for a company to experience financial distress.

9. CACL (Current Assets / Current Liabilities)
   This Liquidity Ratio states how much current assets can be used to pay current liabilities.

10. SIZE (Log [total assets / GNP price-level index])
    This ratio is used to calculate the size of the company externally. In this case, the uncertainty of macroeconomic conditions as measured by the index of the level of gross national income (PNB). The PNB price level index is obtained by dividing nominal PNB by Real PNB. Nominal GNP measures the value of output at the price prevailing during the production period. While Real PNB measures the value of output produced in each period based on a specified base year. The SIZE variable has a negative coefficient which results in a smaller O-Score value.

11. CLCA (Current Liabilities / Current Assets)
    Like the TLTA variable, this solvency ratio also states the level of leverage of a company but is focused in the short term. This variable shows the safe range of a company's finances towards short-term creditors. If the comparison results show> 1, then the company is considered to have difficulty in paying off short-term debt.

12. FUTL (Fund Cash flow from Operations / Total Liabilities)
    This ratio shows the ability of a company's liquidity in generating sufficient cash to finance liabilities, dividend payments, or make investments without using sources of funds from other parties.

13. INTWO
    This variable is a dummy set-up whose values are expressed in numbers "1" and "0". If during the last 2 years, the company has suffered a loss, then the dummy value will be even greater because the coefficient of this variable is positive, meaning that it has the potential to experience financial distress.

14. OENEG
    Like INTWO, this variable is also a dummy set-up. Calculations whose results show the number "1", then shows the company has the potential to not be able to use the total available assets to cover its total liabilities, meaning that the company is experiencing financial distress.

15. CHIN
    The variable included in the profitability ratio has a negative number coefficient value so that it can reduce the O-Score value. This variable shows the company's ability to generate profits by measuring changes in net income obtained during the last 2 years. Nit is the net profit in a certain year, Nit-1 is the net profit in the previous year.
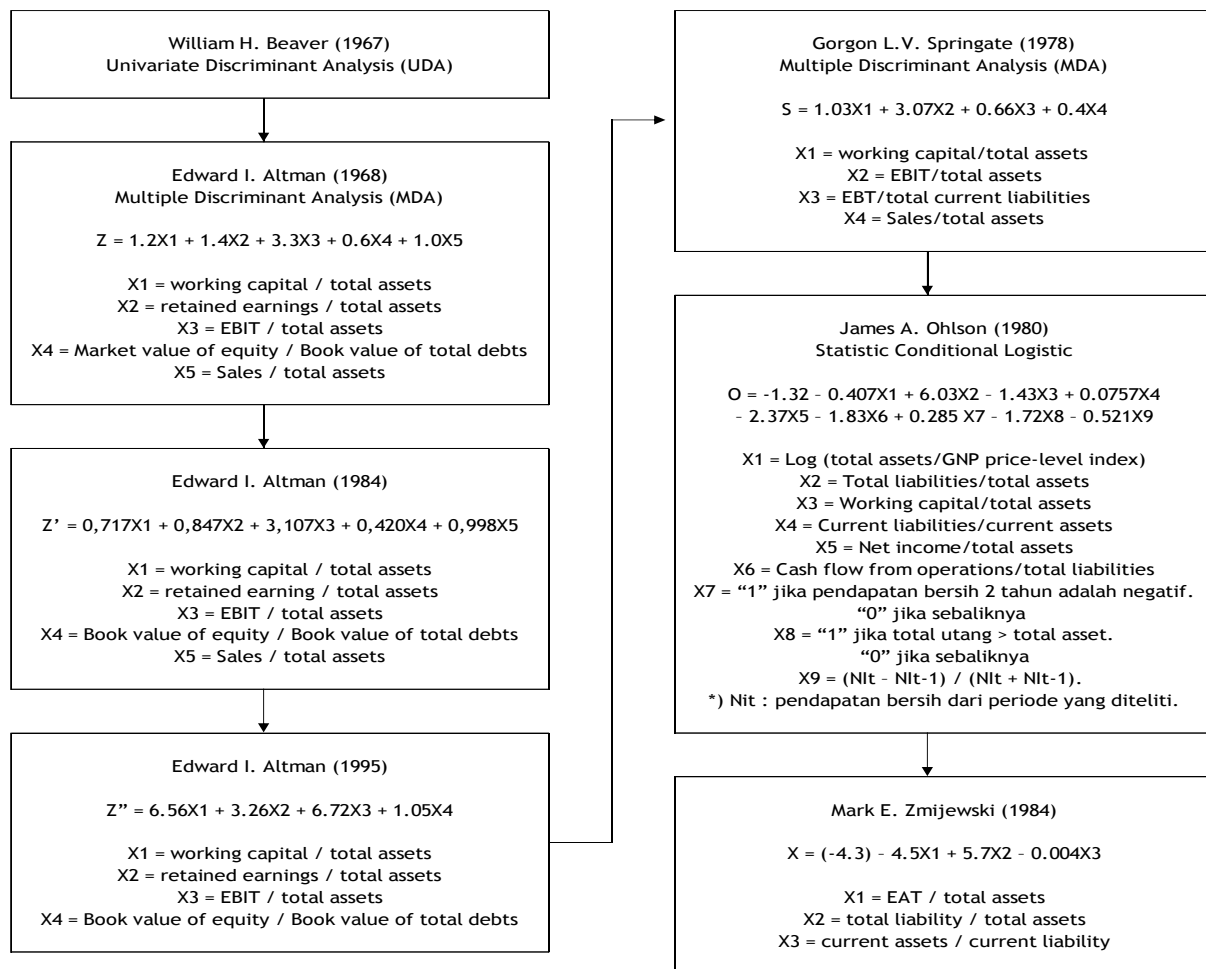
Figure 4. Operational variables

The type of data used in this study is based on secondary, quantitative, and panel data by utilizing the Indonesia Stock Exchange website, the Ministry of Industry website, and the Central Statistics Agency website. Meanwhile, the data collection method in this study uses documentation techniques.

FINDINGS AND DISCUSSION
Descriptive Statistical Analysis
The purpose of descriptive statistical analysis is to know the central tendency of research data description, in the form of minimum value, maximum value, mean value, and standard deviation value.

Table 1. Descriptive Statistics Results of Predictive Models

Model	N	Min	Max	Mean	STDEV.P
Altman	11	(2.4765)	15.8749	4.3842	3.7754
Springate	11	(0.8300)	7.8086	0.9702	1.2454
Ohlson	11	(9.9422)	1.2765	2.0938	1.9748
Zmijewski	11	(6.7637)	1.3847	2.1724	1.3565

In the Altman model, the average value of 11 populations is 4.3842; with the lowest value of -2.4765 directed at PT. Multi Prima Sejahtera, in 2016. While the highest value is 15.8749 directed at PT. Multi Prima Sejahtera, in 2017. In the Springate model, the average value of 11 populations is 0.9702; with the lowest value is -0.8300 directed at PT. Multi Prima Sejahtera, in 2016. While the highest value of 7.8086 directed at PT. Multi Prima Sejahtera, in 2017. In the Ohlson model, the average value of 11 populations is 2.0938; with the lowest value of -9.9422 directed at PT. Gajah Tunggal, in 2015. While the highest value is 1. 2765 directed at PT. Prima Alloy Steel Universal, in 2016. In the Zmijewski model, the average value of 11 populations is 2.1724; with the lowest value of -6.7637 directed at PT. Multi Prima Sejahtera, in 2017. While the highest value of 1.3847 directed at PT. Multi Prima Sejahtera, in 2016. From the four prediction models, it is known that the Altman model has the highest standard deviation value of 3.7754 compared to the other three models, meaning that the sample data in the Altman model is more varied and more diffused from the average value. While the Springate model has the lowest standard deviation value of 1.2454 compared to the other three models, meaning that the sample data in the Springate model is more homogeneous or judged to be almost similar from the average value.

Model Predictive Analysis

The financial ratios that have been processed from the financial statements, then used as operational variables in each research model to predict the company's financial distress. The prediction model tables below explain this condition. This study uses a cross-sectional method, which predicts all populations in any given time series. The results of this study are explained using calculation results tables for each model.

Table 2. Financial Distress Prediction Results – The Altman Model

Code	Issurers	Y.2014	Y.2015	Y.2016	Y.2017	Y.2018
AUTO	Astra Otoparts	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		4.7942	4.4917	5.0226	5.4367	5.0382
BOLT	Garuda Metalindo	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		4.0795	9.1186	7.8062	4.8871	3.7762
BRAM	Indo Kordsa	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		2.8155	3.5147	4.4467	5.4449	5.5660
GDYR	Good Year	Grey Zone	Grey Zone	Grey Zone	Grey Zone	Distress Zone
		2.2797	1.7760	2.2809	1.2448	1.0262
GJTL	Gajah Tunggal	Safe Zone	Grey Zone	Grey Zone	Grey Zone	Grey Zone
		2.8003	2.0721	2.6003	2.2476	2.0390
INDS	Indospring	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		7.1346	5.1593	7.8600	11.2386	11.6362
LPIN	Multi Prima	Safe Zone	Distress Zone	Distress Zone	Safe Zone	Safe Zone
		4.5125	(0.4993)	(2.4765)	15.8749	15.5428
MASA	Multistrada	Safe Zone	Grey Zone	Grey Zone	Grey Zone	Distress Zone
		2.8039	1.8586	1.6079	1.1680	1.0744
NIPS	Nipress	Safe Zone	Grey Zone	Grey Zone	Grey Zone	Grey Zone
		2.7304	1.4903	2.3796	2.1283	1.9119
PRAS	Prima Allow	Grey Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		1.3852	1.0822	0.9295	0.9258	0.3441
SMSM	Selamat Sempurna	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		7.5991	7.5657	8.8874	10.0390	10.6286

In table 2. the results of the financial distress predictions of the Altman model which has a cut-off are shown when Z < 1.1 the company is in the distress zone; if Z > 2,675 the company is in the safe zone; and if between 1.1 <Z> 2,675 the company is in the gray zone. In other words, it cannot be said to be experiencing financial distress or is a company with good financial condition. The prediction results are known, that:

1. 3 companies that are in the gray zone condition at the beginning of the research period and even continued to experience the condition of the distress zone in 2018 because it could not improve the performance of its financial statements, namely PT. Goodyear Indonesia, PT. Multistrada Arah Sarana, And PT. Prima Alloy Steel Universal. If there is no improvement in financial performance in the following year, then these companies are certain to be included in the bankrupt category.

2. 5 companies that are consistently in safe zone conditions, namely PT. Astra Otoparts, PT. Garuda Metalindo, PT. Indo Korsa, PT. Indospring Tbk, and PT. Selamat Sempurna.

3. There is one company that during the observation period was able to improve its financial performance, so it switched from the distress zone to the safe zone condition in 2018, namely PT. Multi Prima Sejahtera.

4. 2 companies which were originally in the safe zone condition, but downgraded to the gray zone condition and cannot improve their conditions in 2018, namely PT. Gajah Tunggal, And PT. Nipress.

Based on the scope of the 5-year observation with 11 populations, the predicted results of the Altman model noted that there were 8 points in the distress zone condition, 16 points in the gray zone condition, and 31 points in the safe zone condition. In 2014 there were 2 companies are conditioned in a gray zone, and 9 companies are conditioned in a safe zone. In 2015 there were 2 companies are conditioned in a distress zone, 4 companies are conditioned in a gray zone, and 5 companies are conditioned in a safe zone. In 2016 there were 2 companies are conditioned in a distress zone, 4 companies are conditioned in a gray zone, and 5 companies are conditioned in a safe zone. In 2017 there was 1 company in the distress zone condition, 4 companies are conditioned in a gray zone, and 6 companies are conditioned in a safe zone. In 2018 there were 3 companies are conditioned in a distress zone, 2 companies are conditioned in a gray zone, and 6 companies are conditioned in a safe zone. Lower range values of -0.4993 experienced by PT. Multi Prima Sejahtera, in 2015; while the upper range value of 15.8749 experienced by PT. Multi Prima Sejahtera, in 2017.

During the observation period, the company with the most financial distress is PT. Prima Alloy Steel Universal, for 4 years (2015, 2016, 2017, 2018). Companies that have never experienced financial distress as many as 5 companies, namely: PT. Astra Otoparts, PT. Garuda Metalindo, PT. Indo Kordsa, PT. Indospring, and PT. Selamat Sempurna. In 2018 was recorded as the year with the highest acquisition of the number of companies experiencing financial distress as many as 3 companies, namely: PT. Goodyear Indonesia, PT. Multistrada Arah Sarana, and PT. Prima Alloy Steel Universal. Conversely, in 2014 no companies were experiencing financial distress, but those that were conditioned in the gray zone.

Table 3. Financial Distress Prediction Results – The Springate Model

Code	Issurers	Y.2014	Y.2015	Y.2016	Y.2017	Y.2018
AUTO	Astra Otoparts	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.8285	0.5659	0.7200	0.8079	0.8053
BOLT	Garuda Metalindo	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		1.4241	2.0293	1.8782	1.5081	1.0137
BRAM	Indo Kordsa	Distress Zone	Distress Zone	Safe Zone	Safe Zone	Safe Zone
		0.7919	0.8508	1.1473	1.3506	1.1916
GDYR	Good Year	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.6422	0.4730	0.5829	0.3781	0.3637
GJTL	Gajah Tunggal	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.6821	0.3402	0.7168	0.4883	0.4273
INDS	Indospring	Safe Zone	Distress Zone	Distress Zone	Safe Zone	Safe Zone
		1.1583	0.4914	0.7344	1.3962	1.3940
LPIN	Multi Prima	Distress Zone	Distress Zone	Distress Zone	Safe Zone	Safe Zone
		0.1426	(0.2677)	(0.8300)	7.8086	2.2208
MASA	Multistrada	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.3096	(0.0767)	0.0710	0.0883	0.0172
NIPS	Nipress	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.7204	0.3984	0.5586	0.3445	0.2508
PRAS	Prima Allow	Distress Zone	Distress Zone	Distress Zone	Distress Zone	Distress Zone
		0.1922	0.1489	0.1061	0.1027	0.0755
SMSM	Selamat Sempurna	Safe Zone	Safe Zone	Safe Zone	Safe Zone	Safe Zone
		2.5536	2.3498	2.6889	3.0657	3.1380

In table 3. the results of the financial distress prediction shown by the Springate model have a cut-off of 0.862; If S < 0.862 the company is in the distress zone, and if S > 0.862 the company is in the safe zone. The prediction results are known, that:

1. 6 companies remain in the distress zone during the observation period, because the operational variables that are binding on this prediction model show poor financial statement performance, namely PT. Astra Otoparts, PT. Goodyear Indonesia, PT. Gajah Tunggal, PT. Multistrada Arah Sarana, PT. Nipress, and PT. Prima Alloy Steel Universal. If there is no improvement in financial performance in the following year, then these companies are certain to be included in the bankrupt category.
2. 2 companies are consistently in safe zone conditions, namely PT. Garuda Metalindo, and PT. Selamat Sempurna.
3. 3 companies are during the observation period were able to improve their financial performance, so they switched from the distress zone to the safe zone conditions in 2018, namely PT. Indo Kordsa, PT. Indospring, and PT. Multi Prima Sejahtera.

Based on the scope of the 5-year observation with 11 populations, the predicted results of the Springate model noted that there were 37 points in the distress zone condition, and 18 points in the safe zone condition. In 2014 there were 8 companies are conditioned in a distress zone, and 3 companies are conditioned in a safe zone. In 2015 there were 9 companies are conditioned in a distress zone, and 2 companies are conditioned in a safe zone. In 2016 there were 8 companies are conditioned in a distress zone, and 3 companies are conditioned in a safe zone. In 2017 there were 6 companies are conditioned in a distress zone, and 5 companies are conditioned in a safe zone. In 2018 there were 6 companies are conditioned in a distress zone, and 5 companies are conditioned in a safe zone. Lower range

values of -0.8300 experienced by PT. Multi Prima Sejahtera, in 2016; while the upper range value of 7. 8086 experienced by PT. Multi Prima Sejahtera, in 2017.

During the observation period,6 companies had financial distress during the observation period, namely PT. Astra Otoparts, PT. Good Year Indonesia, PT. Gajah Tunggal, PT. Multistrada Arah Sarana, PT. Nipress, and PT. Prima Alloy Steel Universal. Companies that have never experienced financial distress as many as 2 companies, namely PT. Garuda Metalindo, and PT. Selamat Sempurna. In 2015 was recorded as the year with the highest acquisition of the number of companies experiencing financial distress as many as 9 companies, namely PT. Astra Otoparts, PT. Indokorsa, PT. Good Year Indonesia, PT. Gajah Tunggal, PT. Indospring, PT. Multi Prima Sejahtera, PT. Multistrada Arah Sarana, PT. Nipress, and PT. Prima Alloy Steel Universal. On the contrary, in 2017 and 2018 were recorded as the year with the highest acquisition of the number of companies that did not experience conditions of financial distress as many as 5 companies, namely PT. Garuda Metalindo, PT. Indokorsa, PT. Indospring, PT. Multi Prima Sejahtera, and PT. Selamat Sempurna.

Table 4. Financial Distress Prediction Results – The Ohlson Model

Code	Issurers	Y.2014	Y.2015	Y.2016	Y.2017	Y.2018
AUTO	Astra Otoparts	Safe Zone (2.3713)	Safe Zone (2.3115)	Safe Zone (2.9616)	Safe Zone (2.6730)	Safe Zone (2.6502)
BOLT	Garuda Metalindo	Safe Zone (1.2135)	Safe Zone (2.3729)	Safe Zone (4.2224)	Safe Zone (1.9757)	Safe Zone (1.3089)
BRAM	Indo Kordsa	Safe Zone (1.9257)	Safe Zone (2.0492)	Safe Zone (3.0743)	Safe Zone (2.8920)	Safe Zone (3.4320)
GDYR	Good Year	Safe Zone (2.0445)	Safe Zone (1.4715)	Safe Zone (2.8256)	Safe Zone (0.1169)	Distress Zone 1.0419
GJTL	Gajah Tunggal	Safe Zone (0.4411)	Safe Zone (9.9422)	Safe Zone (1.8002)	Safe Zone 0.4332	Safe Zone (1.6984)
INDS	Indospring	Safe Zone (3.0133)	Safe Zone (2.1267)	Safe Zone (4.3142)	Safe Zone (5.6198)	Safe Zone (4.2893)
LPIN	Multi Prima	Safe Zone (0.8138)	Safe Zone (0.9340)	Distress Zone 1.1060	Safe Zone (5.4237)	Safe Zone (2.0611)
MASA	Multistrada	Safe Zone (1.2106)	Safe Zone (1.7251)	Safe Zone (0.6002)	Safe Zone (2.3181)	Safe Zone (0.6243)
NIPS	Nipress	Safe Zone (0.6427)	Safe Zone (0.1005)	Safe Zone (0.3524)	Safe Zone 0.0762	Safe Zone (0.5213)
PRAS	Prima Allow	Safe Zone (0.5212)	Safe Zone (0.0656)	Distress Zone 1.2765	Safe Zone 0.2666	Safe Zone (3.1056)
SMSM	Selamat Sempurna	Safe Zone (3.6389)	Safe Zone (3.6409)	Safe Zone (4.4444)	Safe Zone (4.5483)	Safe Zone (4.9304)

In table 4. the results of the financial distress prediction shown by the Springate model have a cut-off of 0.50; If O > 0.50, the company is in the distress zone; and if O < 0.50, the company is in the safe zone. The prediction results are known, that:

1. There is one company that is in a safe zone condition at the beginning of the observation period but has experienced a decline in financial performance in 2018, namely PT. Goodyear Indonesia. The financial performance must be improved so that it returns to its previous condition.

2. 8 companies are consistently in safe zone conditions, namely PT. Astra Otoparts, PT. Garuda Metalindo, PT. Indo Kordsa, PT. Gajah Tunggal, PT. Indospring, PT. Multistrada Arah Sarana, PT. Nipress, And PT. Selamat Sempurna.
3. 2 companies are during the observation period experienced a distress zone but can improve their financial performance so that they return to the safe zone condition in 2018, namely PT. Multi Prima Sejahtera, and PT. Prima Alloy Steel Universal.

Based on the scope of the 5-year observation with 11 populations, the predicted results of the Ohlson model noted that there were 3 points in the distress zone condition, and 52 points in the safe zone condition. In 2014, 2015, and 2017 there were no companies with distress zones. In 2016 there were 2 companies are conditioned in a distress zone, and 9 companies are conditioned in a safe zone. In 2018 there were 1 company in the distress zone condition, and 10 companies are conditioned in a safe zone condition. The value of the upper range which means distress of 1.2765 is experienced by PT. Prima Alloy Steel Universal in 2016; while the lower range value which means safe is -9.9422 also experienced by PT. Gajah Tunggal in 2015. During the observation period, almost all companies were declared not experiencing financial distress, except PT. Good Year Indonesia conditioned in 2018; PT. Multi Prima Sejahtera distress conditioned in 2016; and PT. Prima Alloy Steel Universal conditioned in 2016.

Table 5. Financial Distress Prediction Results – The Zmijewski Model

Code	Issuers	Y.2014	Y.2015	Y.2016	Y.2017	Y.2018
AUTO	Astra Otoparts	Safe Zone (2.9220)	Safe Zone (2.7387)	Safe Zone (2.8650)	Safe Zone (2.9281)	Safe Zone (2.8393)
BOLT	Garuda Metalindo	Safe Zone (2.4562)	Safe Zone (3.8151)	Safe Zone (3.5780)	Safe Zone (2.4209)	Safe Zone (2.0724)
BRAM	Indo Kordsa	Safe Zone (2.1305)	Safe Zone (2.3741)	Safe Zone (2.7537)	Safe Zone (3.0362)	Safe Zone (3.1405)
GDYR	Good Year	Safe Zone (1.2646)	Safe Zone (1.2496)	Safe Zone (1.5123)	Safe Zone (1.0380)	Safe Zone (1.0812)
GJTL	Gajah Tunggal	Safe Zone (0.6800)	Safe Zone (0.2826)	Safe Zone (0.5405)	Safe Zone (0.4004)	Safe Zone (0.2881)
INDS	Indospring	Safe Zone (3.4150)	Safe Zone (2.8954)	Safe Zone (3.4606)	Safe Zone (3.8521)	Safe Zone (3.8599)
LPIN	Multi Prima	Safe Zone (2.5411)	Safe Zone (0.3999)	Distress Zone 1.3847	Safe Zone (6.7637)	Safe Zone (4.2908)
MASA	Multistrada	Safe Zone (2.0186)	Safe Zone (1.6936)	Safe Zone (1.7235)	Safe Zone (1.4604)	Safe Zone (1.2955)
NIPS	Nipress	Safe Zone (1.5405)	Safe Zone (0.9362)	Safe Zone (1.4724)	Safe Zone (1.3174)	Safe Zone (1.2617)
PRAS	Prima Allow	Safe Zone (1.6815)	Safe Zone (1.3089)	Safe Zone (1.0707)	Safe Zone (1.0945)	Safe Zone (1.0190)
SMSM	Selamat Sempurna	Safe Zone (3.3256)	Safe Zone (3.2424)	Safe Zone (3.6081)	Safe Zone (3.9028)	Safe Zone (4.0090)

In table 5. the results of the financial distress Zmijewski model predictions that do not has a cut-off point are shown, only if the prediction value of the model is more than "0" then the company is determined to be in the distress zone. The prediction results are known, that there is only one company that during the study period had experienced a condition of the distress zone, but can make financial performance improvements so that it returns to the safe

zone condition in 2018, namely PT. Multi Prima Sejahtera. And 10 other companies can consistently be in a safe zone condition. Based on the scope of the 5-year observation with 11 populations, the predicted results of the Zmijewski model noted that only 1 point in the distress zone condition, namely PT. Multi Prima Sejahtera in 2016, with the upper range value which means distress of 1.3847.

Based on the results of the four model's prediction and faced with a research background, the automotive component industry growth should have an effect on the automotive industry growth. Then the appropriate model is the Zmijewski model by finding only 1 distressed conditioned point. This research is in line with previous research, conducted by Hantono (2019) who predicts financial distress using the Altman, Grover, and Zmijewski score models in banking companies, and produces a Zmijewski model that has an accuracy rate of 100% with an error rate of 0%. Then the research conducted by Widyanty (2016), which compared the Altman, Springate, Ohlson, and Zmijewski models in predicting financial distress in the LQ-45 IDX company, and produce the most accurate research model is the Zmijewski model as well.

In contrast, this research is not in line with research conducted by Putri (2016) which compares the Altman, Ohlson, and Zmijewski models in predicting electronic companies listed on the Tokyo Stock Exchange; and research conducted by Wulandari (2014) comparing Altman, Springate, Ohlson, Fulmer, Ca-Score, and Zmijewski models to food and beverage companies; each study found the prediction of Ohlson's model to be the most accurate model in predicting financial distress. Other research that does not support this research is a study conducted by Hastuti (2018) that compares the Altman, Ohlson, and Grover models in predicting financial distress in industrial manufacturing issuers and produces the most accurate research model is the Grover model.

CONCLUSION

Based on the research results, it can be concluded that the results of predictions on each model prove that the four models can perform predictive analysis of financial distress. Furthermore, the results of the calculation of each operational variable in each prediction model show that there are issuers experiencing financial distress. The Altman model records 8 points in the distress zone, the Springate model records 37 points in the distress zone, the Ohlson model records 3 points in the distress zone, and the Zmijewski model records 1 point in the distress zone.

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