SPRINGATE, OHLSON, ALTMAN Z-SCORE, ZMIJEWSKI, GROVER, CA SCORE MODEL OF FINANCIAL DISTRESS ANALYSIS IN RETAIL COMPANIES

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Abstract

This study aims to analyze the predictions of the Springate, Ohlson, Altman Z-Score, Zmijewski, Grover, and CA-Score models for retail sector companies listed on the IDX for the 2019-2022 period for financial distress. In this study, a sample of 20 companies in the retail sector was used for the 2019-2022 period using 80 financial reports. The research sample was determined by purposive sampling technique. The data used in this research is secondary data. The data analysis method used is quantitative data analysis. The conclusion of this study is that the most accurate and suitable model for predicting financial distress in retail companies listed on the IDX in the 2019-2022 period is the Grover model.

Keywords: *Springate, Ohlson, Altman Z-Score, Zmijewski, Grover, CA-Score*

1. INTRODUCTION

Companies do not always develop well as expected, many companies fail in business, the factors that cause company failure are: economic factors, management factors and natural disaster factors. At the time of the spread of Covid 19, many companies experienced financial difficulties and even went bankrupt as a result of changes in conditions for economic growth in Indonesia to decline. According to the results of an economic growth survey conducted (Badan Statistics Indonesia, 2021) from 2019 to 2022, Indonesia's results in 2019 grew 5.02%, which was lower than 2018 reaching 5.17%. In 2020 it experienced a growth contraction of 2.07% (c-to-c) compared to 2019. In 2021 it grew 3.69%. In 2022 it grew by 5.31%, higher than the achievements in 2021.

On the other hand, the retail sector experienced a decline in the value of wholesale sales conducted by a survey by Bank Indonesia (BI) from the 2019-2022 period, which indirectly in 2019 was still high compared to the following years due to the Covid 19 pandemic which triggered a freeze.

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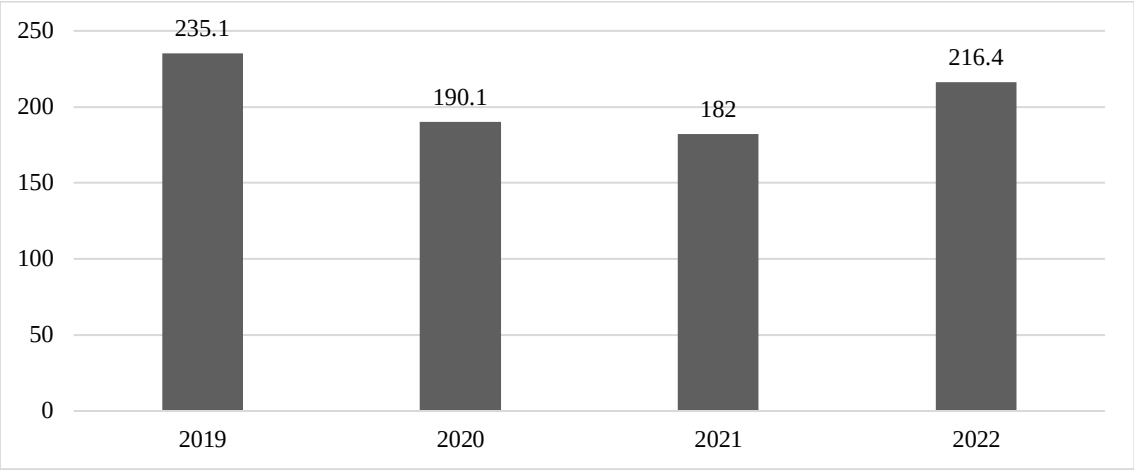

Figure 1 Indonesian Retail Wholesale Sales Value

The table shows the results of a sales survey conducted by Bank Indonesia (BI) from 2019 – 2022. In 2019 Bank Indonesia recorded a total of 235.1%, sales grew 3.6% (yoy) as seen from the Real Sales Index (IPR)) with a higher value compared to September 2019 which only grew 0.7%. In 2020 sales were recorded at 190.1%, experiencing a contraction with IPR growth of -19.2% (yoy) deeper than November of -16.3% (yoy). In 2021 sales value was 182.0%, sales in November grew 10.8% (yoy), an increase from October which was only 6.5%. In 2022 sales value grew by 216.4% or grew 0.4% (yoy).

The decline in the value of sales in the retail sector will have an impact on the company's profits they earn, as a result these retail sector companies cannot cover their daily operational costs such as buying raw materials, renting or direct wages for field workers. This decrease in the value of sales can cause financial distress (bankruptcy) for the company, this is a negative signal for investors and potential investors who will buy or even have shares in the company in the capital market. So that the stock price falls and investors will get a capital loss (loss) in their stock investment portfolio.

There is another phenomenon from the retail sector at PT. Hero Supermarket Tbk (HERO) as of December 2020, shows that the company has suffered a loss of Rp. 1.21 trillion or decreased drastically compared to the previous year's loss of Rp. 28.21 billion. HERO's revenue decreased by 26.98% on an annual basis (year-on-year/yoy) to Rp. 8.89 trillion in 2020 from the previous year's position of Rp. 12.18 trillion. At the end of 2020, the total assets of HERO were recorded at Rp. 4.83 trillion or decreased by 20.08% compared to the amount at the end of the previous year which was Rp. 6.05 trillion. The company's equity also decreased by 49.41% to Rp. 1.85 trillion, while liabilities rose 24.95% to Rp. 2.98 trillion. The bad impact after HERO experienced a decrease in equity even to the point of reducing employees by more than half, which initially had 15,000 employees, now the company only has around 7,975 people, so the company was summoned by the Ministry of Labor (Kemenkerjaan) due to layoffs of more than 7,000 employees.

If the company's condition continues like this and efforts are not made to prevent financial distress, then bankruptcy will occur. Bankruptcy is a condition that can occur in a company if the company experiences difficulties. There are two causes of bankruptcy, namely internal factors and external factors (Sari, 2020). In efforts to prevent financial

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difficulties from occurring, each company needs to detect its financial performance based on certain standards as an indicator of potential financial difficulties or financial distress with a certain formula (Wulandari & Maslichah, 2021). The financial distress prediction model can be developed using the Multiple Discriminant Analysis (MDA) technique by combining several financial ratios in one equation. From several bankruptcy prediction models, their accuracy has been tested in predicting bankruptcy in a company (Salma Salimah & Yunita, 2020). The financial distress model needs to be developed, because by knowing the condition of a company's financial distress at the beginning it can anticipate conditions that lead to bankruptcy. There are several models such as Springate, Ohlson, Altman Z-Score, Zmijewski, Grover, CA-Score and other models.

2. LITERATURE STUDY

Financial Distress

Financial distress is a stage of declining financial condition of a company before going bankrupt. For this reason, early recognition of the condition of companies experiencing financial distress is urgently needed. Early information regarding financial distress conditions in companies provides an opportunity for management, owners, investors, regulators and other stakeholders to make consistent efforts (Fahma & Setyaningsih, 2021).

Bankruptcy

Bankruptcy can be interpreted as a company's failure to carry out operations to achieve its goals. Economic failure that the company is unable to cover the costs of the company itself. Bankruptcy occurs because all of a company's debts exceed the fair value of its total assets, in other words, the company has a negative value or is in an actual state of insolvency (Sumarlan et al., 2020).

Springate Model

Gordon L.V Springate conducted research that resulted in a bankruptcy prediction model. Gordon L.V Springate, hereinafter known as the Springate model (S-Score). Springate is a model for predicting the survival of a company by combining several common financial ratios with different weights given to one another. Springate (1978) developed this method which refers to Altman's method, and uses Multiple Discriminant Analysis (MDA). Springate uses step wise multiple discriminate analysis, which means to choose four out of 19 core financial ratios, so that it can be used to distinguish whether a company is classified as bankrupt or not. The ratios used in the Springate method are the ratio of working capital to total assets, the ratio of profitability (EBIT to total assets and EBT to current liabilities), and the ratio of asset management (Sales to total assets) (Putri et al., 2022).

The Springate Method formula is:

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

Springate put forward the cut-off value method, namely:

- If the S value > 0.862, then it is in the healthy company category.

- If the value of S < 0.862, then the company is categorized as bankrupt.

The advantages of the Springate model according to (Sadikin & Dalimunthe, 2022) are that you can do a combination of various financial ratios simultaneously, and you can adjust the numbers on the coefficients in various ways and independent factors, easy to use, profitability ratios before interest rates and taxes on all assets is a good indicator in assessing the level of bankruptcy with the ratios of WCTA, EBITTA, EBCL, and TSA.

Ohlson Model

Ohlson (1980), inspired by previous studies, also conducted a study on financial distress. According to (Lutfiyyah & Bhilawa, 2021) Ohlson's model has 9 ratios with 2 ratios using a dummy variable that is used to see the condition of a company's financial distress, according to Ohlson it has an important role to determine the company's financial condition by calculating company size, liquidity and financial structure. This model uses logit analysis which can be used to cover deficiencies in the multiple discriminante analysis method. However, there were several modifications made in his study compared to previous studies (Fahma & Setyaningsih, 2021).

$$O = -1.32 - 0.407X1 + 6.03X2 – 1.43X3 + 0.0757X4 – 2.37X5– 1.83X6 + 0.285X7 – 1.72X8 – 0.521X9$$

The Ohlson method has the following cut-off values:

- If the value of O <0.38, then the company is categorized as healthy.

- If the value of O > 0.38, then the company is categorized as bankrupt.

The classification of healthy and unhealthy companies is based on the Ohlson model for an O-Score of less than 0.38 (O-Score <0.38) meaning that the company is financially healthy. As for the O-Score value exceeding or equal to 0.38 (O-Score ≥ 0.38), the company is included in the classification of companies with unhealthy conditions (Salma Salimah & Yunita, 2020).

Altman Z-Score Model

Edward I. Altman is a researcher who uses Multi Discriminate Analysis (MDA) which uses financial ratio analysis to predict business failure or bankruptcy with the term Z-Score. The study, which is called the Altman Z-score, is a study using five types of financial ratios that can be combined to see whether a company is bankrupt or not experiencing bankruptcy (Priyono et al., 2020). This model with the formula:

$$Z\text{-Score} = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$$

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The classification of company conditions is based on the Z-Score value of the Altman model, namely:

- If the Z value is < 1.10 then the company is included in the distress zone category.

- If the value is 1.10 < Z" < 2.60 then the company is included in the gray zone category.

- If the Z value "> 2.60 then the company is included in the safe zone category.

The Ohlson Model formula is:

There are three points will be discussed in literature review, the basic theory, previous study and hypothesis from previous study.

Zmijewski Model

In 1984 Zmijewski criticized the sampling method used by his predecessors. According to him, matched-pair sampling led to bias in the results of previous studies. Therefore, Zmijewski used a random sampling technique in his research, as in Ohlson's research. In his research, Zmijewski requires one crucial thing. The proportion of the sample and the population must be determined at the outset, so that the frequency of bankruptcy can be determined by dividing the number of bankrupt samples by the total sample. This model with the formula:

X = -4.3- 4.5 X1 + 5.7 X2 – 0.004X3

The classification used by the Zmijewski model is:

- If the X-Score is less than 0, then the company is categorized as a healthy company.

- Whereas if the X-Score is greater than 0, then the company has the potential to go bankrupt.

Grover Model

The Grover model is a derived model from the Altman Z-Score model which was re-researched by Jeffrey S. Grover (Kason et al., 2020). Jeffrey S. Grover used a sample according to the Altman Z-Score model, namely adding 13 new financial ratios to 35 companies experiencing distress and 35 companies not experiencing distress from 1982 to 1996 (Lutfiyyah & Bhilawa, 2021). This model with the formula:

G-Score = 1.650X1 + 3.404X3 –0.016ROA + 0.057

According to Grover, the classification is:

- If the G-Score is less than or equal to 0.01, then the company is categorized as a non-bankrupt company.

- If the G-Score is greater than 0.02, the company is categorized as bankrupt.

CA-Score Model

The CA-Score model was developed under the leadership of Jean Legault University of Quebee in Montreal, using multi-stage discriminative analysis to analyze the failure rate of companies in Canada. This model uses the following formula:

CA-Score = 4.5913x1 + 4.508x2 + 0.3936x3 – 2.7616

From the calculation results (Kartikasari & Hariyani, 2019)the CA - Score model obtained values that were divided into two categories as follows:

- If the CA-Score is < -0.3, the company is included in the non-bankrupt category.

- If the CA-Score value is > -0.3, the company is included in the bankrupt category.

Accuracy Level and Error Type

This test is used to test the level of accuracy of each prediction model. The accuracy test is carried out by comparing the results of each prediction model using samples from the results of the financial distress and non-financial distress categories. This step is carried out to see whether the prediction level is correct or not between the predicted results of the model and the actual one. According to (Kason et al., 2020) to find out the highest level of accuracy can be calculated using the following method

Accuracy rate= ((number of predictions)/(number of samples))×100%

According to (Salma Salimah & Yunita, 2020), apart from the level of accuracy used to predict bankruptcy, another check is used, namely the error level. Error is divided into two categories, namely type I and type II. Type error I is used to predict errors from a sample of companies that are declared not bankrupt but are in fact bankrupt.

Type Error I= ((number of predictions)/(number of samples))×100%

For Type II error it is used to predict errors from a sample of companies that were declared bankrupt but in fact the sample was not bankrupt. The error rate is calculated in the following way:

Type Error II= ((number of predictions)/(number of samples))×100%

The advantage of the Zmijewski model is that it is able to describe a company's ability to pay short-term debt and long-term debt using profit levels, cut-off values that are not low or high. The data needed comes from a company's financial statements (Saputri et al., 2018).

3. RESEARCH METHODOLOGY

This research is descriptive quantitative in nature to assess a model(Sadikin & Dalimunthe, 2022). By using descriptive it can be used to explain a phenomenon that occurs or even later the data is used as a detector so that the company can take action by internal parties, while for external parties it can be used as information for making decisions concerning the company (Munjiyah & Artati, 2020). This study uses the dependent variable, namely financial distress, while the independent variables are the

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Springate model, the Ohlson model, the Altman Z-Score model, the Zmijewski model, the Grover model, and the CA-Score model.

The population in this study are retail companies listed on the Indonesia Stock Exchange (IDX) for the 2019-2022 period. Total population there are 23 companies. Sampling in this study using purposive sampling method of determining the sample with certain considerations that aim to make the data obtained more responsive. The research samples that met the criteria were 13 companies namely ACES, BOGA, CARS, CSAP, ECII, ERAA, GLOB, IMAS, LPPF, MAPA, MPMS, PJMS, MAPI, MKNT, RALS, SLIS, SONA, TELE, TRIO and ZONE.

4. RESULT AND DISCUSSION

1. The Results of the Springate Financial Distress Model

Table 1. Results of The Springate Financial Distress Model

Code	Springate Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	2.1965	S	2.1557	S	2.1170	S	3.4011	S
BOGA	0.7164	B	0.7485	B	0.5271	B	0.7864	B
CARS	0.8449	B	0.1957	B	(0.3571)	B	0.6751	B
CSAP	0.8189	B	0.8673	S	0.7783	B	0.8857	S
ECII	0.8516	B	0.7928	B	0.6478	B	0.7759	B
ERAA	1.6717	S	2.3754	S	1.8069	S	1.8145	S
GLOB	(96.6339)	B	(52.6424)	B	(52.3624)	B	(39.0124)	B
IMAS	0.1124	B	(0.0017)	B	(0.0389)	B	0.0931	S
LPPF	1.6185	S	1.2142	S	(0.5667)	B	2.4505	S
MAPA	2.0074	S	1.1678	S	0.6491	B	1.2922	S
MPMS	1.2432	S	0.9544	S	0.7928	B	1.3718	S
PMJS	1.9963	S	1.6020	S	1.2462	S	3.2720	S
MAPI	1.4110	S	0.7294	B	0.1934	B	1.2922	S
MKNT	2.0149	S	1.9792	S	2.8706	S	2.1506	S
RALS	1.2672	S	0.9337	S	0.4000	B	1.6741	S
SLIS	1.7228	S	1.3801	S	1.2181	S	1.5015	S
SONA	0.2046	B	(0.7553)	B	(0.8785)	B	1.8892	S
TELE	(4.6964)	B	(0.1433)	B	0.0211	B	(0.1230)	B
TRIO	(1.0256)	B	(16.0638)	B	(14.4257)	B	(73.4246)	B
ZONE	1.4694	S	0.8962	S	0.0052	S	1.1666	S

Source: Data processed by researchers, 2023

The results of the Springate model which is below the cut off value of 0.862 can be seen that from a sample of 20 retail companies in 2022, there were 9 companies used, in 2021 there were 9 companies, in 2020 there were 14 companies, in 2019 there were 6 companies that were indicated to be experiencing financial distress, meaning from the ratio of the Springate model, there are 38 retail companies in the 2022-2019 period for 4 years which are indicated to be experiencing financial distress. The Springate model is above the cut-off value of 0.862 which is indicated in a healthy state far from a state of

financial distress. This is in accordance with the results which stated that there were 11 companies in 2022, in 2021 there were 11 companies, in 2020 there were 6 companies, in 2019 there were 14 companies which were declared healthy companies with a total of 42 from the 2019-2022 period for 4 years.

2. The Results of the Springate Financial Distress Model

Table 2. Results of The Springate Financial Distress Model

Code	Ohlson Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	3.3697	B	3.1680	B	2.9585	B	3.4010	B
BOGA	1.8460	B	1.3699	B	0.3874	B	0.4643	B
CARS	1.2432	B	(0.5622)	S	(1.4769)	S	1.0144	B
CSAP	0.4542	B	0.3213	S	0.6877	B	0.9106	B
ECII	1.7603	B	3.4148	B	2.4283	B	1.2747	B
ERAA	0.9722	B	1.1572	B	1.3260	B	1.9406	B
GLOB	(387.4479)	S	(203.5032)	S	(187.9678)	S	(170.0234)	S
IMAS	(1.7794)	S	(1.6595)	S	(6.9822)	S	(4.0493)	S
LPPF	(0.8974)	S	(23.7570)	S	0.2145	S	0.0572	S
MAPA	1.7998	B	1.8355	B	2.5089	B	1.1234	B
MPMS	1.0788	B	0.4479	B	1.0891	B	1.5587	B
PMJS	1.5803	B	1.2790	B	2.0650	B	3.0510	B
MAPI	0.6700	B	6.7404	B	0.5431	B	1.1234	B
MKNT	(0.2531)	S	2.7387	B	3.3013	B	2.7284	B
RALS	2.7331	B	(2.2076)	S	1.8806	B	3.0226	B
SLIS	3.4275	B	3.1099	B	2.4486	B	2.4172	B
SONA	1.4898	B	3.2513	B	1.0011	B	3.7762	B
TELE	(14.7794)	S	(3.5430)	S	(0.6805)	S	(2.1153)	S
TRIO	(104.7627)	S	(58.3614)	S	(32.6580)	S	15.2710	B
ZONE	1.4390	B	6.6661	B	(30.3879)	S	0.0723	S

Source: Data processed by researchers, 2023

From the Ohlson model, it can be seen that from a sample of 20 retail companies in 2022, 14 companies were used, in 2021 there were 12 companies, in 2020 there were 13 companies, in 2019 there were 15 companies that were indicated to be experiencing financial distress, meaning that from the ratio of the Ohlson model there were 54 companies. retail in the 2022-2019 period, companies that have been in financial distress for 4 years. The Ohlson model is below the cut off value of 0.38. This is in accordance with the results stating that there are 6 companies in 2022, in 2021 there are 8 companies, in 2020 there are 7 companies, and in 2019 there are 5 companies which are companies that are declared healthy with the total from the 2019-2022 period being 4 years.

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3. The Results of the Springate Financial Distress Model

Table 3. Results of The Springate Financial Distress Model

Code	Altman Z-Score Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	13.9703	S	20.6294	S	6.9929	S	9.0754	S
BOGA	14.3826	S	18.1872	S	0.8721	B	0.9144	S
CARS	0.9510	G	0.2018	B	-0.7786	B	2.6200	S
CSAP	534.4377	S	368.5204	S	0.7508	B	1.0033	B
ECII	2.3694	G	2.8464	S	2.1019	G	1.8522	G
ERAA	668.4590	S	412.6998	S	3.0618	S	2.8705	S
GLOB	-948.6431	B	-551.9649	B	-596.0007	B	-650.1228	B
IMAS	58,368.3740	S	96,122.8381	S	-0.8118	B	-0.5213	B
LPPF	2,280,939.8110	S	2,361,785.6464	S	-0.5282	B	6.8009	S
MAPA	3,907,591.7515	S	3,640,325.7726	S	3.7116	S	3.0505	S
MPMS	1,942,019.1718	S	1,486,000.9643	S	2.0962	G	3.1736	S
PMJS	5.0215	S	4.1317	S	2.9271	S	6.5063	S
MAPI	2,240,696.4013	S	1,277,499.9757	S	0.4855	B	3.0505	S
MKNT	564.1573	S	3.4122	S	3.1245	S	3.3112	S
RALS	2,818,835.8017	S	3,278,466.3356	S	4.6271	S	6.6456	S
SLIS	8.1029	S	13.1404	S	3.5936	S	3.9531	S
SONA	8.0492	S	26.6960	S	4.1235	S	6.8674	S
TELE	80,697.6712	S	85,600.5272	S	-0.4996	B	-0.2030	B
TRIO	-384.0546	B	-369.8319	B	-308.8683	B	-188.5780	B
ZONE	5.6463	S	3.9648	S	1.0580	S	1.8417	S

Source: Data processed by researchers, 2023

From the Altman Z-Score, it can be seen that from a sample of 20 retail companies in 2022, there were 2 companies used, in 2021 there were 3 companies, in 2020 there were 9 companies, and in 2019 there were 5 companies that were indicated to be experiencing financial distress. The Altman Z-Score model is above the cut-off value of 2.60. This is in accordance with the results which stated that there were 16 companies in 2022, in 2021 there were 17 companies, in 2020 there were 9 companies, in 2019 there were 14 companies which were declared healthy companies with a total of 56 from the 2019-2022 period for 4 years. Whereas in 2022 there will be 2 companies, in 2021 there will be 0 companies, in 2020 there will be 2 companies, and in 2019 there will be 1 in a gray area.

4. The Results of the Springate Financial Distress Model

Table 4. Results of The Springate Financial Distress Model

Code	Zmijewski Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	-3.7160	S	-3.4491	S	-3.1854	S	-3.9864	S
BOGA	-1.7009	S	-2.0155	S	-2.8649	S	-2.8823	S
CARS	0.2240	B	1.2143	B	1.2642	B	0.1162	B
CSAP	-0.2020	S	-0.2417	S	-0.1772	S	-0.3583	S
ECII	-2.6584	S	-2.8396	S	-2.6826	S	-2.9521	S
ERAA	-1.2958	S	-2.2876	S	-1.7671	S	-1.6676	S
GLOB	610.5005	B	383.7604	B	449.9947	B	534.6156	B
IMAS	-0.0528	S	-0.0154	S	-0.0375	S	0.1815	B
LPPF	-0.2600	S	-0.2849	S	1.4954	B	-1.9369	S
MAPA	-2.7584	S	-2.2660	S	-1.7768	S	-1.9958	S
MPMS	-2.9097	S	-2.4082	S	-2.5853	S	-3.1582	S
PMJS	-2.6826	S	-2.3483	S	-2.8183	S	10.2499	B
MAPI	-1.7877	S	-1.1463	S	-0.5541	S	-1.9958	S
MKNT	-3.8426	S	1.4561	B	1.4667	B	1.2541	B
RALS	-2.9768	S	-2.7968	S	-2.5062	S	0.8698	B
SLIS	-2.1812	S	-1.8461	S	-1.5731	S	-1.5336	S
SONA	-1.8985	S	-3.2909	S	-2.6328	S	-3.2111	S
TELE	207.2267	B	110.9943	B	-0.0212	S	-3.9024	S
TRIO	225.9350	B	250.6509	B	216.0490	B	159.0804	B
ZONE	-2.1444	S	-1.7273	S	-0.9398	S	-2.3588	S

Source: Data processed by researchers, 2023

From the Zmijewski model, it can be seen that from a sample of 20 retail companies in 2022, there are 4 companies used, in 2021 there are 5 companies, in 2020 there are 5 companies, and in 2019 there are 7 companies that are indicated to be experiencing financial distress, meaning that from the ratio of the Zmijewski model there are 21 retail companies in the 2022-2019 period. The Zmijeski model has a cut-off value of <0. This is in accordance with the results which state that there are 16 companies in 2022, in 2021 there are 15 companies, in 2020 there are 15 companies, and in 2019 there are 13 companies which are companies that are declared healthy with a total of 59 years. 2019-2022 for 4 years.

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5. The Results of the Springate Financial Distress Model

Table 5. Results of The Springate Financial Distress Model

Code	Grover Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	1,068.6501	S	1,026.1901	S	954.4188	S	1,120.2814	S
BOGA	424.8819	S	413.3097	S	74.3775	S	81.6892	S
CARS	31.8028	S	175.4075	S	105.9816	S	558.6640	S
CSAP	45.1185	S	82.2650	S	77.8165	S	136.8300	S
ECII	498.6187	S	586.4488	S	529.9528	S	386.4723	S
ERAA	212.7543	S	340.7251	S	354.1430	S	394.4522	S
GLOB	(121,972.0443)	B	(64,922.3468)	B	(62,148.6200)	B	(58,691.9455)	B
IMAS	(216.1442)	B	(244.2105)	B	(199.3972)	B	(176.9844)	B
LPPF	(260.0726)	B	(156.2487)	B	(325.8160)	B	52.8289	S
MAPA	597.4997	S	595.5371	S	484.0800	S	294.8376	S
MPMS	317.5689	S	156.8698	S	174.2017	S	305.1253	S
PMJS	542.7508	S	464.6379	S	550.0736	S	1,245.9196	S
MAPI	250.2681	S	152.7912	S	76.6198	S	294.8376	S
MKNT	893.0739	S	1,035.7380	S	1,170.9035	S	1,196.4691	S
RALS	783.3300	S	759.3178	S	710.2372	S	842.1761	S
SLIS	976.2385	S	823.4209	S	638.8258	S	665.7378	S
SONA	804.1050	S	1,269.8868	S	1,225.2969	S	1,029.2965	S
TELE	(8,197.5025)	B	(2,458.0174)	B	134.6918	S	23.6740	S
TRIO	(30,801.3492)	B	(20,957.7627)	B	(13,381.2059)	B	1,231.2211	S
ZONE	445.1099	S	356.7289	S	296.0587	S	1.1600	S

Source: Data processed by researchers, 2023

The results of the Grover model with a cut-off value > 0.02 can be seen that from a sample of 20 retail companies in 2022, 5 companies were used, in 2021 there were 5 companies, in 2020 there were 4 companies, in 2019 there were 2 companies that were indicated to be experiencing financial distress, This means that from the ratio of the Grover model, there are 16 retail companies in the 2022-2019 period that have been indicated to be experiencing financial distress for 4 years. The Grover model with a cut-off value of <0.01. This is in accordance with the results which stated that there were 15 companies in 2022, in 2021 there were 15 companies, in 2020 there were 16 companies, in 2019 there were 18 companies which were declared healthy companies with a total of 64 from the 2019-2022 period for 4 years.

6. The Results of the Springate Financial Distress Model

Table 6. Results of The Springate Financial Distress Model

Code	CA – Score Model							
	2022	Info	2021	Info	2020	Info	2019	Info
ACES	3,700,307,047,399	B	3,872,007,418,506	B	4,162,397,645,236	B	5,770,277,588,804	B
BOGA	113,269,837,335	B	168,921,883,246	B	71,157,132,207	B	79,572,696,562	B
CARS	939,031,085,696	B	-1,746,596,447,474	S	-4,232,014,871,650	S	-441,564,378,428	S
CSAP	1,527,637,672	B	1,298,596,750	B	517,325,895	B	473,549,136	B
ECII	53,552,137,523	B	63,761,584,879	B	-74,922,491,315	S	143,902,724,664	B
ERAA	6,750,006,536	B	6,739,752,403	B	4,135,263,873	B	2,131,021,742	B
GLOB	-313,090,886,522	S	-264,752,362,528	S	-228,387,675,532	S	-168,137,592,329	S
IMAS	4,146,204	B	25,868	B	-1,996,784,767,404	S	1,678,204,872,683	B
LPPF	7,380,970	B	4,973,929	B	-4,210,385	S	7,950,311	B
MAPA	6,930,698	B	1,553,273	B	-38,476	S	7,328,700	B
MPMS	3,101,598	B	2,410,414	B	1,280,078	B	3,093,767	B
PMJS	2,046,479,106,413	B	1,222,274,194,694	B	454,762,669,082	B	906,555,592,413	B
MAPI	14,304,014	B	3,122,308	B	-3,258,602	S	7,333,229	B
MKNT	-184,318,816,013	S	-136,873,628,014	S	-250,172,566,086	S	-515,229,580,199	S
RALS	1,922,600	B	870,187	B	-811,791	S	3,310,855	B
SLIS	245,278,948,997	B	147,174,647,234	B	147,412,785,079	B	182,456,862,810	B
SONA	-284,840,543,823	S	-421,598,524,913	S	-766,657,365,001	S	-471,247,277,617	B
TELE	-1,237,587	S	-371,245	S	-961,739	S	-2,005,382	S
TRIO	1,935,248,131,719	B	-693,932,074,017	S	-1,252,879,407,031	S	-459,757,223,929	S
ZONE	437,624,075,012	B	167,846,211,059	B	-200,584,513,265	S	219,352,139,502	B

Source: Data processed by researchers, 2023

The results of the CA-Score model with a cut-off value > -0.3 can be seen that from a sample of 20 retail companies in 2022, 16 companies were used, in 2021 there were 14 companies, in 2020 there were 7 companies, and in 2019 there were 15 companies indicated experienced financial distress, meaning that from the ratio of the CA-Score model there were 52 retail companies in the 2022-2019 period that were indicated to be experiencing financial distress for 4 years. The CA-Score model is above the cut-off value, which is < -0.3. This is in accordance with the results which stated that there were 4 companies in 2022, in 2021 there were 5 companies, in 2020 there were 13 companies, in 2019 there were 5 companies which were declared healthy companies with a total of 28 from the 2019-2022 period for 4 years.

5. CONCLUSION

The results of the calculation above data for each financial ratio show that six analysis models can be applied, namely the Springate, Ohlson, Altman Z-Score, Zmijewski, Grover and CA-Score models in predicting financial distress in retail companies listed on the Indonesia Stock Exchange for the 2019-2022 period . Of the 6 models with the highest degree of accuracy, namely the Grover Model, which has an accuracy rate of 80% and Type Error of 20%. Followed by the Zmijeski Model which has an accuracy rate of 73.75% and an error type of 26.25%. The Altman Z-Score model has an accuracy rate of 70% and an error type of 30%. Springate model with 55% accuracy rate and 45% error type. CA-Score model with 35% accuracy and 65% error type. And the Ohlson model with an accuracy rate of 35% and 65% error type

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