

Bankruptcy Analysis Using the Altman Z-Score Model (Study on Retail Companies Listed on the Indonesia Stock Exchange)



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ABSTRACT: Bankruptcy is a legal or economic event that often results in the complete cessation of all business activities and operations. This bankruptcy usually starts with liquidity problems, but is closely linked to situations where a company's debt exceeds its total assets. The objective of this study is to evaluate the effectiveness of the Altman Z-score model as a tool to predict bankruptcy. The main focus of this study is retail companies listed on the Indonesia Stock Exchange in 2021-2023. 31 companies participated in the study, supported by 93 financial statements. The researchers used purposive sampling method for the sampling process. The study uses the modified Altman Z-score method (1995) to analyze the obtained data. The analysis revealed that 17 companies (54.8%) could be classified as healthy. 3 companies (9.7%) were classified as weak, and 11 companies (36.7%) were expected to go bankrupt. These results provide insight into the financial health of the retail companies surveyed and highlight the importance of using predictive models to determine bankruptcy risk.

KEYWORDS: Altman Z-Score, Bankruptcy, Financial Ratios

PRELIMINARY

Advances in global economic development are changing the lives of people around the world. The digitization of the economy is a direct consequence of globalization. The influence of technology on economic growth is evident in countries like Indonesia (Fahira, 2021). Companies that have experience and solidity will increasingly benefit from the increasing influence of technological globalization. The development of the economic revolution in the Indonesian industrial world will have a considerable impact on the country's industry. The evolution of the digital era has changed people's behavior, especially in the retail sector. The rise of online shopping and intense competition has led to a decline in sales growth of traditional retail companies over the past five years, reflecting the shift in people's consumer habits towards more modern methods.

Based on Bank Indonesia data developed in Lubis and Kusuma (2022), it explains that the growth of retail companies in Indonesia has experienced significant fluctuations several times. The high decline occurred in 2020-2021 to almost -21% due to the COVID-19 pandemic which required people to reduce outdoor activities so that many companies operating offline switched functions to go digital to meet customer needs. For some retail startups or small companies, it is certain to experience financial difficulties because they do not have the ability to reach customers in real time through digital.

The main cause that can affect the performance of the retail company itself is the trending market sentiment and inflation that occurs resulting in significant fluctuations that occur in the Indonesian economy (Lubis and Kusuma, 2022). Retail, which should be a fairly profitable business, is now a cause for concern. One of them is the planned increase in value-added tax (VAT) to 12% starting January 1, 2025. This has caused many negative thoughts about the worsening economic situation. Chairman of the Indonesian Shopping Center Managers Association (APPBI) Alphonse Widjaja said that his party encourages the government to cancel or postpone the increase in value-added tax rates. The increase in value-added tax rates will cause product prices to be higher. This increase in product prices can place a burden on the community. As a result, people's purchasing power may decline. In line with the Chairman of the Indonesian Retail and Shopping Center Tenants Association (Hippindo) Budiharjo Iduansjah said that the domestic retail industry has not recovered since the pandemic. He is worried that the VAT increase will have an impact on retail sales and could cause retail sales to slump.

If the price of goods offered is too expensive, then people only have two choices: reduce spending or look for cheaper goods. With the increase in VAT, the price of goods sold at retail will also increase. thus, transactions will decrease due to price increases. The VAT increase is also expected to increase the cost of production and consumption, resulting in a decline in the

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goods and services sector, especially trade. Lower productivity affects fiscal conditions and lowers corporate earnings and public consumption. Retailers will inevitably give deep discounts on products that are in demand, or reduce the inventory of products that are less desirable to consumers. Although this can cause losses, it is a solution that is very helpful for the survival of the company as well as an anticipation of the company going bankrupt.

Financial analysis in dealing with potential company bankruptcy is very important for various stakeholders (Priego-de-la-Cruz et al., 2020). When a company experiences bankruptcy, it is not only the company that is harmed, but also the parties related to it. It is crucial to conduct predictive bankruptcy analysis to detect the early symptoms of financial problems in time. This way, the company will be able to take preventive action and avoid bankruptcy. The sooner action is taken, the better for the future of the company. Raharjo et al (2023) explained that several large retail companies in Indonesia closed several outlets because they were unable to keep up with the economic fluctuations that occurred in Indonesia. Some of them are Transmart permanently closed 7 of its outlets, Golden Truly officially closed its offline outlets permanently and chose to move to an online platform in serving its customers, as many as 13 Matahari outlets were permanently closed due to the company's lack of development in the region, and Giant company which closed the company gradually because it was unable to compete with other retail companies in the food sector. Various analyses have been developed by several researchers to detect the possibility of bankruptcy early on in order to mitigate the risk of bankruptcy permanently. One of them is the model proposed by Altman which eventually became a bankruptcy analysis method called Altman Z-Score.

The Altman Z-Score is a research tool widely recognized for its ability to predict bankruptcy with a high degree of accuracy. The method was developed by renowned economics professor at New York University, Edward I. Altman, this model has been shown to achieve 95% accuracy for one year and 75% for two years before bankruptcy. Many researchers rely on this formula when conducting similar studies. The financial ratios contained in the Altman Z-Score generally use 5 ratios that represent liquidity, profitability, and activity. The liquidity ratio, profitability ratio, and activity ratio serve as decision-making tools for creditors and companies in predicting bankruptcy.

Buele et al (2021) in their research that uses the Altman Z-Score model to analyze the situation of companies during the pandemic. They found that 8% of a total of 102 retail companies in Ecuador were in a critical situation with conditions in the red zone, in other words, bankruptcy was confirmed. Meanwhile, research by Pertiwi and Putri (2021) found that 3 out of 6 large retail companies listed on the Indonesia Stock Exchange are in bankruptcy, or in other words, half of the total public companies in the retail sector in Indonesia are in the potential for bankruptcy.

Based on the findings of previous researchers and also some phenomena related to the assessment of the condition of public retail issuers listed on the Indonesia Stock Exchange using the Altman Z-score model, the Altman Z-Score can be used as an important verification tool before investors decide to invest in stocks. Therefore, the Z-score is very important to use as an indicator to improve the company's financial health. where, indicators of financial failure can affect the performance and stability of the economy which can cause the company to face bankruptcy.

LITERATURE REVIEW

Signaling theory highlights the relevance of information that companies communicate regarding investment decisions made by external actors. It is important for investors and entrepreneurs to have complete, relevant, accurate and timely information, as it allows them to obtain a comprehensive view of the past, current and future state of the company, as well as its impact on the market. This information serves as a valuable analytical tool for investors in the capital market, assisting them in making informed investment decisions. The dissemination of information serves as a catalyst for investors to make informed decisions regarding their investments. When the information presented is favorable, it encourages investors to take action and make investment decisions. When information has been disclosed and disseminated to all market participants, a market reaction is expected. Upon receiving this information, market participants perform initial interpretation and analysis, categorizing it as a positive signal (good news) or a negative signal (bad news). If the disclosure of this information is considered favorable to investors, then this will result in a shift in stock trading volume (Spence, 1973).

The connection between signal theory and bankruptcy analysis arises from the possibility that the analysis itself may serve as a signal. When the analysis shows that a company falls into the healthy category, it can be considered a positive signal or good news. Conversely, if the analysis shows that the company is potentially bankrupt, then it is considered a negative signal or bad news.

Financial statements are lists compiled by accountants at the end of a company's period (El-Haj et al., 2020). The list is the balance sheet or asset inventory and the income list minus the expense list or income statement. At this point, a third list is usually added (surplus list), which consists of possible surpluses or deficits that are usually included in the statement of changes

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in capital. The information generated during the financial year is produced by management as a means of accountability to the owners of the business and shared with other stakeholders.

Financial reporting plays an important role for every stakeholder (Vitolla et al., 2019). Among them, investors who need to make decisions regarding their investments, shareholders who want to evaluate the company's ability to pay dividends, or employees and representative groups who seek information about the company's corporate performance and profitability, as well as the services, benefits, and employment opportunities it offers. Financial statements are very important to lenders as they provide the information needed to assess the ability to repay loans and interest on a timely basis. Suppliers and other trade creditors require accurate information to ensure that payments will be made on time. It is important to evaluate the short-term impact compared to lenders, as trade creditors play an important role in the business world. In addition, customers want to know the viability of a company, especially if they have long-term contracts and depend on it. Governments and various agencies under their jurisdiction show interest in commercial activities as a basis for determining taxation policies and compiling national income or other statistics. Financial statements are also very important to society. These financial statements benefit the general public by providing information on the current trends and development of a company's prosperity and the scope of its activities.

According to Abdulshakour (2020), the main purpose of financial information lies in providing accurate and reliable data regarding the assets, liabilities, and equity of a company. This information is essential for understanding the transformation in organizations and the net economic resources obtained by subtracting debt from the resources they have. In addition, it allows users of financial statements to evaluate the potential profitability of the company. Relevant information regarding the variation of economic resources and liabilities is also included, covering aspects such as expenditures and investment activities. Where possible, additional financial reporting-related information that is relevant to meet the needs of users is provided, including details on the accounting principles that the entity applies.

One of the functions of financial statements is that they can be used to analyze bankruptcy from the start. Bankruptcy usually refers to the inability of a company to carry out its business activities to generate profits (Ellias and Stark, 2020). Mild bankruptcy is often associated with liquidation problems, while a greater level refers to the closure of the company with problems with a debt burden greater than assets (solvency). Bankruptcy can be caused by a variety of causes. In some cases, the explanation can only be known after a detailed examination of the financial statements. Some organizations are in a state of bankruptcy, while others are not. While some companies experience a decline in performance, various aspects of financial reporting remain strong.

The causes of bankruptcy can be broadly divided into two types, namely internal factors and external factors. Internal factors are factors generated within the business organization. While external factors can come from external elements that are directly related to the company's activities or from macroeconomic variables.

Srebro et al (2021) explain that bankruptcy information is useful for many parties, including lenders. Bankruptcy information helps determine who gets credit and monitor policies. For investors, it can be useful when a company issues securities, of course they are very interested in the possibility that the company selling it will go bankrupt, investors who follow an active strategy identify signs of bankruptcy as early as possible and develop bankruptcy prediction models to predict its likelihood. The government must supervise various sectors of the economy as well as economic actors that require supervision. Authorities seek to identify early signs of bankruptcy in order to act in a timely manner. Meanwhile, accountants need information about the viability of the company, as they analyze the company's ability to continue operating. Furthermore, if managers can recognize the signs of bankruptcy early on, then they can take appropriate austerity measures to reduce bankruptcy costs. For example, it helps avoid bankruptcy costs in the event of a merger or financial restructuring.

By examining the financial statements of a company, it will be able to obtain an overview of the company's financial status and progress. One of the most frequently used methods of calculating bankruptcy is the Altman Z-Score model. Edward I. Altman, a finance professor at New York University, created the Altman Z-Score formula in 1967 and published it in 1968. Altman (1968) conducted research on the same topic as Beaver (1968), but used the MDA (multivariate discriminant analysis) technique initiated by Fisher (1936).

The function of predicting corporate bankruptcy is to provide an indication to parties whether a company will experience financial difficulties in the future. Bankruptcy is a serious and costly problem, so companies need to develop a system that can make it happen (Gordon, 1971). Providing an early warning system is very helpful for management. Business owners can make the necessary improvements as soon as possible to avoid bankruptcy. Z-score is a standardized calculation multiplied by financial ratios and indicates how likely a company is to go bankrupt. The adapted Altman Z-score model is a bankruptcy prediction formula that has been developed in several countries.

Altman (1968) developed a model based on financial indicators, which is an in-depth analysis of 22 financial ratios over a five-year period. Altman examined a group of 33 bankrupt and non-bankrupt companies in his study, and his model was able to accurately identify 90% of bankrupt companies one year before they went bankrupt.

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Altman and Spivack (1983) created a new discriminant model, the revised Z score. In his latest research, Altman adjusted the bankruptcy prediction model to adapt it to companies without stock market value or private companies. The original revised Z-score affected not only the variable X4, but also the coefficients of each variable. This Z-score model is different from the previous model.

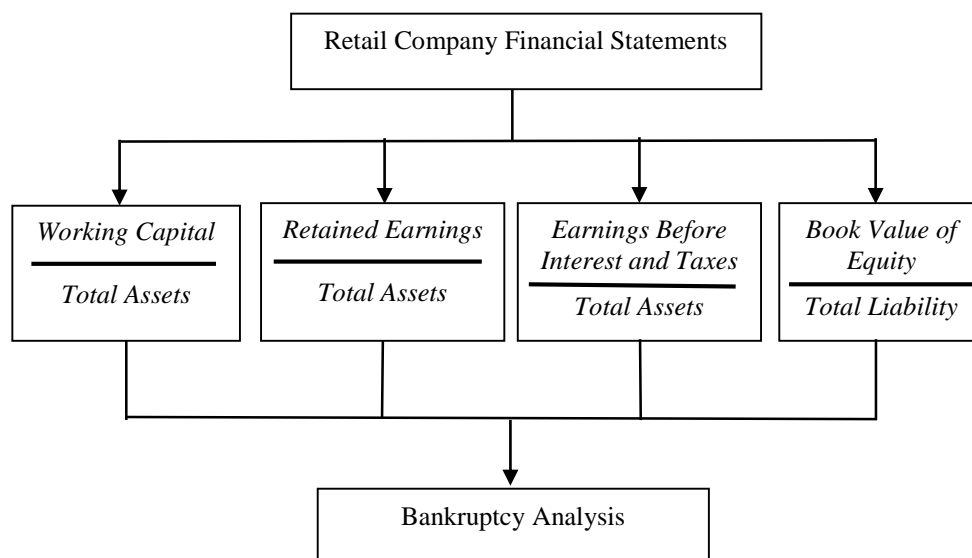
Altman et al (1995) created a new discriminant analysis model that allows bankruptcy prediction models to be applied across different types of companies, such as manufacturing, non-manufacturing, and debt issuers in developing countries. The modified Altman Z-score eliminates the variable X5 (Variable Sales divided by Total Assets). The reason is because this relationship fluctuates significantly between industries with different asset sizes. The results of Altman's research resulted in the following bankruptcy prediction analysis : $Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$. Where description : Z'' as *Overall Indeks*; $X_1 = Working Capital / Total Assets$; $X_2 = Retained Earnings / Total Assets$; $X_3 = Earnings Before Interest and Taxes / Total Assets$; $X_4 = Book Value of Equity / Total Liability$ (Altman et al, 1995).

The distinction between bankrupt and solvent companies is determined through the modified Z-Score value according to Altman et al (1995), among others: a) Z-score of less than 1.10 indicates that the company is in a financially risky situation, which significantly increases the likelihood of the company being declared bankrupt. b) Z-score between 1.10 and 2.60 is considered a vulnerable zone, also known as a gray zone. In this situation, the company faces financial challenges that require urgent attention from management. If the response is late or ineffective, the risk of bankruptcy will increase significantly. Therefore, within the vulnerability range, the decision to declare bankruptcy will depend on the management's ability to act quickly and effectively in solving the financial problems faced by the company. c) Z-value of more than 2.60 indicates that the company is in the healthy zone. This indicates that the company enjoys a solid and stable financial situation, which greatly reduces the risk of bankruptcy. The following is the calculation flow of bankruptcy analysis with the Altman Z-score model scheme:

Figure 1 : Bankruptcy analysis measurement flowchart

METHODS

This research uses descriptive methodology with a quantitative approach. Svenson (1945) states that descriptive research is a systematic method that seeks to accurately describe the facts, characteristics, and relationships between the phenomena being investigated. Researchers collect research data, study it together with the literature that has been reviewed, and attempt to analyze its practical use. Quantitative research methods are characterized by their focus on the analysis of numerical data, which are processed using statistical techniques. Generally, quantitative research is research that involves a large number of samples. In this study, the authors chose the subject of annual financial reports (annual reports) of retail subsector public companies listed on the Indonesia Stock Exchange to be studied. The author uses the research location of the retail subsector public companies listed on the Indonesia Stock Exchange.



Measurement using the 1995 Modified Altman Z-Score model with details: Working Capital to Total Assets is used to evaluate the company's ability to fulfill its short-term commitments. The company will experience a surplus of working capital compared to its total assets if the working capital exceeds its total assets. Retained Earnings to Total Assets serves to show the effectiveness of a company in generating retained earnings from its total assets, and the greater the profit, the greater the

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company's capital accumulation. Earnings Before Interest and Taxes to Total Assets is used to measure the actual productivity of a company's assets, namely the profit from the assets used. Book Value of Equity to Total Liability is used to measure the company's ability to raise funds and is included in the range of assets. Generally, companies prepare stock reports that reflect changes in shareholder rights. The way to calculate Book Value of Equity to Total Liability is to divide the book value of equity by the book value of debt.

The research population consists of 47 companies listed on the Indonesia Stock Exchange. The sampling strategy in this study used a purposive sampling approach, which is a non-random method (Patton, 1990). The sampling method in this study focuses on identifying certain characteristics that are aligned with the research objectives. This method relies on experience in the population to select sample elements in a non-random manner that represents the entire population. The author uses a research sample of 31 retail companies listed on the Indonesia stock exchange from the selection results using several criteria with time series data for 3 years (2021-2023).

The type of data in this study is quantitative data, namely data in the form of numbers generated from real situations with data in the form of secondary data obtained through several websites related to company financial report files, namely www.idx.id; Yahoo Finance; Investing; TradingView; and the official website of the retail sub-sector company listed on the Indonesia Stock Exchange. The data collection method by the author uses the documentation method, which is a method that involves collecting data from documents such as notes, reports, and archives relevant to the research. The author collects data in the form of financial reports of retail sub-sector companies listed on the Indonesia Stock Exchange for 2021-2023.

Data processing uses Microsoft Office Excel computing tools to calculate ratios from the variable results of the Modified Altman Z-Score formula (1995). Researchers first extract information from existing raw data and try to find events that occur in the data, namely describing, representing, and summarizing the data set. This stage is carried out using descriptive analysis using the Altman Z-Score bankruptcy prediction reference in the form of :

$$Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

description :

Z'' = Overall Indeks

X_1 = Working Capital / Total Assets

X_2 = Retained Earnings / Total Assets

X_3 = Earnings Before Interest and Taxes / Total Assets

X_4 = Book Value of Equity / Total Liability

Source : Altman et al (1995)

The distinction between bankrupt and solvent companies is determined through the modified Z-Score value according to Altman et al (1995): a) Z-value of less than 1.10 indicates that the company is in a financially risky situation, which significantly increases the likelihood of the company being declared bankrupt. b) Z-value between 1.10 and 2.60 is considered a vulnerable zone, also known as a gray zone. c) Z-value of more than 2.60 indicates that the company is in a healthy zone.

RESULTS AND DISCUSSION

The process of calculating the Z-score and categorizing it in the appropriate section, it is necessary to use the modified Altman Z-Score model (1995) and analyze the financial ratios of retail companies listed on the Indonesia Stock Exchange. Furthermore, the results must be categorized in the Altman Z-Score model equation through multiplication. The acquisition of each ratio is then summed up so as to obtain the results of the bankruptcy detection analysis.

Table 1: Calculation Results with the Modified Altman Z-Score Model (1995)

No	Code	Year	6,5 X1	3,26 X2	6,72 X3	1,05 X4	Z''-Score	Mean
1	ACES	2021	4,08	2,22	0,76	3,45	10,51	12,20
		2022	5,78	3,07	1,04	5,09	14,98	
		2023	4,00	2,14	0,82	4,15	11,11	
2	AMRT	2021	-0,52	0,71	4,32	0,51	5,03	3,27
		2022	-0,37	0,93	0,79	0,62	1,97	
		2023	0,01	1,06	0,85	0,89	2,81	
3	BOGA	2021	1,65	0,32	0,31	1,40	3,68	4,18
		2022	1,69	0,35	0,19	1,18	3,41	
		2023	3,39	0,40	0,16	1,51	5,46	
4	CARS	2021	0,70	-0,10	-0,60	0,13	0,13	0,38

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No	Code	Year	6,5 X1	3,26 X2	6,72 X3	1,05 X4	Z"-Score	Mean
		2022	0,13	0,03	0,37	0,22	0,75	
		2023	-0,77	0,19	0,54	0,31	0,26	
		2021	0,33	0,36	0,23	0,38	1,30	
5	CSAP	2022	0,18	0,39	0,24	0,37	1,17	1,16
		2023	0,00	0,37	0,15	0,47	1,00	
		2021	-1,60	-1,08	-0,46	0,12	-3,02	
6	DAYA	2022	-1,60	-1,26	-0,37	0,05	-3,18	-3,03
		2023	-1,52	-1,34	-0,07	0,03	-2,90	
		2021	2,98	1,45	0,48	4,13	9,03	
7	DMND	2022	2,83	1,48	0,49	3,87	8,66	8,97
		2023	2,72	1,52	0,39	4,59	9,22	
		2021	2,33	0,15	0,05	2,96	5,49	
8	ECII	2022	1,98	0,19	0,04	2,51	4,73	4,82
		2023	1,67	0,19	0,05	2,35	4,25	
		2021	3,61	2,13	0,75	2,49	8,99	
9	EPMT	2022	3,55	2,08	0,71	2,30	8,64	8,56
		2023	3,41	2,02	0,54	2,09	8,06	
		2021	1,35	1,14	0,88	1,38	4,76	
10	ERAA	2022	0,84	0,89	0,59	0,77	3,09	3,54
		2023	0,85	0,82	0,41	0,69	2,77	
		2021	-266,44	-273,34	-29,98	-1,03	-570,79	
11	GLOB	2022	-492,73	-419,82	-51,52	-1,04	-965,10	-944,37
		2023	-722,42	-505,71	-68,04	-1,04	-1297,21	
		2021	-0,77	-1,23	-0,80	0,17	-2,63	
12	HERO	2022	-0,88	-1,09	-0,38	0,16	-2,18	-2,80
		2023	-2,01	-1,38	-0,56	0,34	-3,60	
		2021	-0,97	0,03	0,00	0,35	-0,58	
13	IMAS	2022	-1,63	0,10	0,21	0,34	-0,97	-0,47
		2023	-0,39	0,08	0,12	0,34	0,15	
		2021	1,93	1,02	2,19	5,28	10,41	
14	KMDS	2022	2,73	0,98	1,76	4,05	9,52	10,65
		2023	3,16	1,21	1,78	5,87	12,03	
		2021	4,76	-0,76	0,50	7,88	12,37	
15	KONI	2022	4,57	-0,37	0,71	5,12	10,03	11,47
		2023	4,67	0,06	1,05	6,21	11,99	
		2021	-0,62	2,48	1,27	0,22	3,34	
16	LPPF	2022	-1,04	2,43	1,91	0,12	3,43	2,64
		2023	-1,68	1,87	0,95	0,01	1,15	
		2021	0,61	0,64	0,28	0,77	2,29	
17	MAPA	2022	0,99	0,85	1,02	0,91	3,76	3,16
		2023	0,94	0,86	0,78	0,86	3,44	
		2021	-7,49	-22,75	4,59	-0,66	-26,31	
18	MDRN	2022	-3,22	-23,85	2,34	-0,62	-25,35	-26,77
		2023	-3,01	-25,38	0,39	-0,63	-28,63	
		2021	-1,20	0,61	0,35	0,36	0,13	
19	MIDI	2022	-0,85	0,75	0,49	0,42	0,81	1,08
		2023	-0,15	0,83	0,56	1,06	2,30	
		2021	0,31	0,21	0,07	0,46	1,06	
20	MLPL	2022	0,00	0,28	0,02	0,56	0,88	0,98
		2023	0,00	0,34	0,08	0,59	1,01	
		2021	0,62	0,99	0,36	1,82	3,79	
21	MPMX	2022	1,26	1,05	0,52	2,40	5,23	4,80

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No	Code	Year	6,5 X1	3,26 X2	6,72 X3	1,05 X4	Z"-Score	Mean
22	MPPA	2023	1,23	1,06	0,49	2,58	5,36	-3,79
		2021	-0,53	-0,22	-2,91	0,15	-3,51	
		2022	-1,31	-2,09	-0,71	0,05	-4,06	
		2023	-0,98	-2,41	-0,49	0,08	-3,80	
23	PCAR	2021	2,19	-2,05	0,06	1,59	1,78	2,40
		2022	2,06	-2,30	0,33	1,56	1,65	
		2023	3,47	-2,10	0,52	1,87	3,76	
24	PMJS	2021	1,85	0,48	0,46	1,70	4,48	5,03
		2022	2,16	0,62	0,73	1,96	5,46	
		2023	1,98	0,64	0,50	2,05	5,17	
25	RALS	2021	3,02	2,35	0,25	2,54	8,16	8,63
		2022	3,11	2,40	0,55	2,60	8,66	
		2023	3,19	2,57	0,46	2,85	9,08	
26	RANC	2021	-0,27	0,48	0,04	0,53	0,78	-0,13
		2022	-0,49	0,34	-0,43	0,48	-0,09	
		2023	-0,76	0,04	-0,67	0,33	-1,06	
27	SLIS	2021	2,36	0,51	0,54	1,13	4,54	6,85
		2022	3,88	0,76	0,81	1,29	6,74	
		2023	5,17	0,86	0,38	2,86	9,28	
28	SONA	2021	5,06	1,80	-0,85	7,38	13,40	8,69
		2022	3,20	1,21	-0,43	1,68	5,65	
		2023	3,52	1,28	0,19	2,02	7,02	
29	TRIO	2021	-83,39	-278,91	-10,60	-1,03	-373,93	-378,96
		2022	-122,89	-298,90	33,52	-1,03	-389,29	
		2023	-114,17	-250,71	-7,75	-1,03	-373,66	
30	UFOE	2021	-0,47	0,24	0,24	0,77	0,78	1,28
		2022	0,06	0,33	0,27	0,89	1,55	
		2023	-0,10	0,41	0,27	0,92	1,50	
31	ZONE	2021	1,42	0,74	0,44	1,07	3,68	4,26
		2022	1,76	0,96	1,00	1,20	4,92	
		2023	1,63	0,95	0,54	1,05	4,17	

Source: Data processed, 2024

The researcher analyzed the Altman Z-Score method which includes the calculation of various ratios such as working capital to total assets, retained earnings compared to total assets, earnings before tax and interest compared to total assets, and book value of equity relative to book value of debt.

Table 2: Average Classification of the Modified Altman Z-Score (1995)

No	Company Name	Stock Code	Description
1.	PT Ace Hardware Indonesia Tbk	ACES	Health
2.	PT Sumber Alfaria Trijaya Tbk	AMRT	Health
3.	PT Bintang Oto Global Tbk	BOGA	Health
4.	PT Bintraco Dharma Tbk	CARS	Bankrupt
5.	PT Catur Sentosa Adiprana Tbk	CSAP	Prone
6.	PT Duta Intidaya Tbk	DAYA	Bankrupt
7.	PT Diamond Food Indonesia Tbk	DMND	Health
8.	PT Electronic City Indonesia Tbk	ECII	Health
9.	PT Enseval Putera Megatrading Tbk	EPMT	Health
10.	PT Erajaya Swasembada Tbk	ERAA	Health
11.	PT Global Teleshop Tbk	GLOB	Bankrupt

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No	Company Name	Stock Code	Description
12.	PT Hero Supermarket Tbk	HERO	Bankrupt
13.	PT Indomobil Sukses Internasional Tbk	IMAS	Bankrupt
14.	PT Kurniamitra Duta Sentosa Tbk	KMDS	Health
15.	PT Perdana Bangun Pusaka Tbk	KONI	Health
16.	PT Matahari Department Store Tbk	LPPF	Health
17.	PT Map Aktif Adiperkasa Tbk	MAPA	Health
18.	PT Modern Internasional Tbk	MDRN	Bankrupt
19.	PT Midi Utama Indonesia Tbk	MIDI	Bankrupt
20.	PT Multipolar Tbk	MLPL	Bankrupt
21.	PT Mitra Pinasthika Mustika Tbk	MPMX	Health
22.	PT Matahariputra Prima Tbk	MPPA	Bankrupt
23.	PT Prima Cakrawala Abadi Tbk	PCAR	Prone
24.	PT Putra Mandiri Jembar Tbk	PMJS	Health
25.	PT Ramayana Lestari Sentosa Tbk	RALS	Health
26.	PT Supra Boga Lestari Tbk	RANC	Bankrupt
27.	PT Gaya Abadi Sempurna Tbk	SLIS	Health
28.	PT Sona Topas Tourism Tbk	SONA	Health
29.	PT Trikonsel Oke Tbk	TRIO	Bankrupt
30.	PT Damai Sejahtera Abadi Tbk	UFOE	Prone
31.	PT Mega Perintis Tbk	ZONE	Health

Source: Data processed, 2024

Based on the results of the calculation of company bankruptcy predictions using the Modified Altman Z-Score method and the classification presented in table-2, it is known that of the 31 companies analyzed, most companies are predicted to have a healthy condition.

Table 3: Percentage of Company Condition

No	Number of Companies	Percentage	Description
1	17	54,8%	Health
2	3	9,7%	Prone
3	11	36,7%	Bankrupt

Source: Data processed, 2024

Based on this analysis, if the Z value of the analyzed company is less than 1.1, there is a high risk of bankruptcy, while a Z value greater than 2.6 indicates that the company is protected from bankruptcy. A company with a high Z-score will show its strength, which according to the signaling theory coined by Spence (1973) explains that it will send a positive signal to investors to buy the company's shares. Conversely, a low Z-score indicates that the company is vulnerable to bankruptcy, thus giving a negative signal to investors so that investors reconsider buying the company's shares.

CONCLUSION

Altman's Modified Z-Score is well suited to adapt to the economic landscape in Indonesia, and serves as an early warning system against potential bankruptcy. Therefore, proactive measures can be implemented to prevent such situations. The modified Altman Z-Score model can forecast the financial state of retail companies listed on the Indonesia Stock Exchange during 2021-2023. Of the 31 companies examined, 11 companies (36.7%) are expected to go bankrupt. The likelihood of bankruptcy increases if the company's management does not take immediate action to assess its financial health. It is important for all companies to improve their performance to mitigate the risk of bankruptcy.

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