

# Financial Difficulty Prediction Model (Study on Property and Real Estate Companies Listed on the Indonesian Stock Exchange)

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## ABSTRACT

The purpose of this study is to identify and predict the occurrence of financial difficulties using the Altman Z-Score and Zmijewski X-Score models in property and real estate companies listed on the Indonesia Stock Exchange (IDX) for the 2018-2020 period. This type of research is descriptive research with a quantitative approach. The data used is secondary data in the form of company financial statements. The results showed that based on the Altman model (Z-Score) in 2018 there were 3 companies in the safe zone, 6 companies in the grey zone, and 13 companies in the distress zone. While in 2019 there were 4 companies in the safe zone, 4 companies in the grey zone, and 14 companies in the distress zone. And in 2020 there are 2 companies in the safe zone, 6 companies in the grey zone, and 14 companies in the distress zone. While the results of the study based on the Zmijewski model (X-Score) show that in 2018 there were 21 companies in the safe zone and 1 company in the distress zone. While in 2019 all companies were in the safe zone, lastly in 2020 there were 20 companies in the safe zone, and 2 companies in the distress zone.

**Keywords:** Altman Z-Score, Zmijewski X-Score

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## INTRODUCTION

In setting up a company, the goal is to get as much profit as possible, maintain the continuity of the company and maximize the welfare of shareholders. The goals of a company are achieved when there is good corporate management within the company. Good management is demonstrated by the ability to manage company resources and run the company's business well (Pratiwi, 2020).

Because of this, the company must be able *survive* with increasingly strong competition. This allows the company to survive in the global environment and continue to improve its performance to continue to innovate. Because that yes, one companies need to have planning and proper control in order to be able to compete healthily and critically (Jonathan, 2018).

According to Prasandri (2018) profit is used to determine the company's performance at a particular time and usually as the concern of certain individuals who assess the fulfillment of the obligations of the management section when processing resources entrusted to be used in evaluating. However, this assumption does not always live up to expectations. Companies that have been in business for a specified period of time often disbanded or closed due to financial difficulties and bankruptcy. The *company* also has to make various analyses, The main one is related to his bankruptcy as soon as possible. Through analysis, it really helps companies to anticipate or strengthen vigilance to avoid bankruptcy risk.

current situation in Indonesia is very vulnerable to financial difficulties (*financial distress*) in national companies. This is the result of the *Covid-19* pandemic which is affecting almost every country in the world. When March 2020, there was a *Virus outbreak Covid-19* in Indonesia, with *Covid-19* will indirectly affect the country's economy. *Covid-19* is an epidemic that can be transmitted. The new *virus* has not been detected before spreading in Wuhan, China from December 2019 *continuing* to this moment. *Covid-19* has required the temporary suspension of various businesses and other activities in many countries to prevent the spread of this virus (Rahmadia et al., 2020).

Weaken it Indonesian economy resulting in unfavorable trade developments. circumstances economy in weakened Indonesia can make a *company* experience financial difficulties. Financial difficulties take place before bankruptcy, the quicker the financial difficulties are traced, the company can quickly overcome its financial difficulties, and the company's management can carry out reforms so that the company does not go bankrupt. One solution to avoid bankruptcy is to predict bankruptcy as an early warning. Bankruptcy is the final status of a *company* causing the loss of the opportunity to earn profits and continue the company's activities.

According to Torres (2017) there are 2 factors causing the company to experience difficulties, namely, external and internal elements. External elements are the context of trade, political situations, and disasters (such as natural disasters). While the internal elements are the company's capabilities, *company* policies *company's* cultural customs. Bankruptcy or the failure of a *company* triggers investors and collectors to feel insecure about the *company's* situation, therefore if financial

difficulties are detected earlier the *company* can take action to prevent and overcome financial difficulties.

The importance of information on the condition of a company experiencing financial difficulties so that when a company is in this condition, all parties, both internal and external to the company, must take steps on this signal. Because this signal can be used as a reference for all parties in order to make decisions to prevent bankruptcy.

#### 1. *Financial Report*

According to Sutrisno (2012) report keuangan bro is the final result from process accountancy which have 2 reports main namely the balance sheet and profit and loss. Report finances arranged with purpose of providing information finance company to party who has an interest in as a basis for make a decision. And according Fahmi (2012) financial reports is information the describes the condition circumstances or conditions finance an company and the financial situation can't be an illustration company's financial performance

#### 2. *Analysis Report Finance*

According to O (2012) report finance is a that report will show something condition finance company When this or in periods. The purpose of financial statement analysis to show the of a company According to Riyanto Bambang (2012) analysis of statements (*Financial Statement*), provides regarding *financial condition* a company, where The balance sheet (*Balance Sheets*) reflects the value of assets, debt and own capital certain period, W statement w *Income Statement*) reflects the results achieved during period.

#### 3. *Financial Difficulties and Bankruptcy*

According to Fahmi (2016) if a company middle having problems on liquidity then possibility big the company will start enter period difficulty financial, if circumstances it's not quick overcome then can cause bankruptcy in the company. So to be able avoid bankruptcy..then various policies and strategies are needed from both internal and external parties Reason trouble occurs finance according to Fahmi t (2013) is started from inability in fulfill their obligations, most important namely short-term liabilities, problems that can in bankruptcy can occur due to difficulties in liquidity.

#### 4. *Altman model (Z-Scores)*

The Altman Z-Score model is one of the models that predicts a level of prediction i of 94% for models first Altman, and for models which has been revised by 95%. Altman's model uses 5 ratio which d i combine with method special for get one equation n Edward I. Altman, 1968). In use model Altman's as measurement predicts difficulty financial and bankruptcy non nature monotone and rather can develop over time a time, testing and invention model Keep going expanded and developed oh leh Altman so that implementation not for manufacturing companies that are public but also includes manufacturing companies non-public k and also company private.

### 5. Model Zmijewski (X-Score)

In his research Zmijewski requires one thing that is, comparison sample and population must be determined at the start, so it gets magnitude frequency bankruptcy. The frequency can be by dividing number of samples of companies that experience bankruptcy and the total sample size. Zmijewski used 840 companies as a sample, namely 800 companies that were not bankrupt and 40 companies that experienced bankruptcy. Zmijewski created his equations using logit statistics techniques, with use metho .

## METHOD

This research is a type of *descriptive research* through a quantitative approach. According to Sugiyono (2014) *descriptive research* is *research* that observes the capacity of a group of people , objects, conditions, voting systems, or current events. The purpose of *descriptive research* is to create precise, original and accurate explanations, pictures or paintings about the reality, nature and relationship between the characteristics studied.

The methodology this test is a quantitative methodology. Quantitative methodology is research that requires examining information as numbers (Hendrayadi and Suryani, 2015) . So in this test it has destination so that explain specifics variable which tested through Data is used in the form of numbers. In this test, researchers measure the viability of the *company* through the Altman and Zmijewski methods.

## RESULTS AND DISCUSSION

### A. Research result

#### 1. Calculation of the Altman Model (Z-Score )

Based on the calculation results of the five ratios, namely *Working Capital to Total Assets*, *Retained Earnings to Total Assets*, *Earning Before Interest and Tax to Total Assets*, *Market Value of Equity to Book Value of Total Liabilities*, and *Sales to Total Assets* , then it will be multiplied by standard of each predetermined ratio as shown by the following Z-Score equation:

$$Z = 1.2 X 1 + 1.4 X 2 + 3.3 X 3 + 0.6 X 4 + 1.0 X 5 \text{ (Edward I. Altman, 1968)}$$

After knowing the results of the Z-Score calculation, it will be adjusted to the cut-off point, which is as follows:

1. Z-Score > 2.99 (*Safe Zone*)
2. 1.81 < Z-Score < 2.99 (*Grey Zone*)
3. Z-Score < 1.81 (*Distress Zone*)

After calculating the Z-Score for each company, the results are quite different from year to year. The higher the resulting Z-Score value or exceeding the specified cut-off point, which is 2.99, the more it indicates that the company is not experiencing financial difficulties and avoids the possibility of bankruptcy. Conversely, the lower the resulting Z-Score or

less than the cut-off point of 1.81 , the more it indicates that the company is experiencing financial difficulties and is likely to go bankrupt. For more details, the following is a table of company conditions based on the calculation results of the Z-Score model for 2018 -2020 :

**Table 1. Company Conditions Based on the 2018 Z-Score Model 8 -2020**

No.	Company name	2018	2019	2020
1	Agung Podomoro Land Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
2	Alam Sutera Realty Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
3	Binakarya Jaya Abadi Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
4	Bhuwanatala Indah Permai Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
5	Sentul City Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
6	Bumi Serpong Damai Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
7	Natura City Developments Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
8	Ciputra Development Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
9	Duta Anggada Realty Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
10	Intiland Development Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
11	Megapolitan Development Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
12	Perdana Gapuraprima Tbk	<i>Grey</i>	<i>Grey</i>	<i>Distress</i>
13	Greenwood Sejahtera Tbk	<i>Grey</i>	<i>Grey</i>	<i>Grey</i>
14	Indonesian Paradise Property Tbk	<i>Grey</i>	<i>safe</i>	<i>Grey</i>
15	Jaya Real Property Tbk	<i>Grey</i>	<i>Grey</i>	<i>Grey</i>
16	Jababeka Industrial Estate Tbk	<i>Grey</i>	<i>Distress</i>	<i>Distress</i>
17	Lippo Cikarang Tbk	<i>Distress</i>	<i>Distress</i>	<i>Grey</i>
18	Modernland Realty Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
19	Metropolitan Land Tbk	<i>Grey</i>	<i>Grey</i>	<i>Grey</i>
20	Pakuwon Jati Tbk	<i>safe</i>	<i>safe</i>	<i>Grey</i>
21	Suryamas Dutamakmur Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>
22	Summarecon Agung Tbk	<i>Distress</i>	<i>Distress</i>	<i>Distress</i>

Source: Processed Data, 2022

Table 1 above describes the conditions of *Property and Real Estate Companies* for three consecutive years, namely 2018 -2020 based on the Altman Model (Z-Score). During the study period, most of the companies were in the *distress zone* , and the other companies were spread out in the *gray* and *safe zones* . PT Natura City Developments Tbk , is a company that has consistently been in the *safe zone* for three years in a row. Then the other companies are spread out into

other categories. This condition indicates that almost all companies experienced fluctuations in the value of the *Z-Score* during the study period. So even though the company is in the *safe zone*, sometimes the resulting *Z-Score* value is close to the *cut-off point* so that this condition is not good for companies that are already in the *safe zone*.

## 2. Zmijewski Model Calculation (X-Score)

Based on the calculation results of the three ratios, namely *Return on Assets*, *Total Debt to Total Assets*, and *Current Ratio*, which will then be multiplied by the standard of each ratio that has been determined as the equation of the Zmijewski model (*X-Score*), which is as follows:

$$X = -4.3 - 4.5 X_1 + 5.72 X_2 + 0.004 X_3 \text{ (Mark E. Zmijewski, 1984)}$$

After obtaining the results from the Zmijewski model equation (*X-Score*), the results of the equation will be categorized according to the assessment criteria or predetermined *cut-off points*, which are as follows:

1.  $X < 0$  (*Safe Zone*)
2.  $X > 0$  (*Distress Zone*)

After calculating the *X - Score* for each company, the results are quite different from year to year. The more negative the resulting *X- Score value* or less than 0 as the specified *cut-off point*, the more it indicates that the company's financial condition is healthy and avoids the possibility of bankruptcy. On the contrary, the more positive the resulting *X - Score value* or more than 0 as the specified *cut-off point*, the more it indicates that the company is experiencing financial difficulties and has the potential to experience bankruptcy. For more details, the following is a table regarding the company's condition based on the calculation results of the Zmijewski model (*X-Score*) for 2018-2020 :

**Table 2 Company Conditions Based on the 2018 X-Score Model 8 -20 20**

No.	Company name	2018	2019	2020
1	Agung Podomoro Land Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
2	Alam Sutera Realty Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
3	Binakarya Jaya Abadi Tbk	<i>safe</i>	<i>safe</i>	<i>Distress</i>
4	Bhuwanatala Indah Permai Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
5	Sentul City Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
6	Bumi Serpong Damai Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
7	Natura City Developments Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
8	Ciputra Development Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
9	Duta Anggada Realty Tbk	<i>Distress</i>	<i>safe</i>	<i>safe</i>
10	Intiland Development Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
11	Megapolitan Development Tbk	<i>safe</i>	<i>safe</i>	<i>Distress</i>
12	Perdana Gapuraprima Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
13	Greenwood Sejahtera Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
14	Indonesian Paradise Property Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
15	Jaya Real Property Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>

16	Jababeka Industrial Estate Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
17	Lippo Cikarang Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
18	Modernland Realty Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
19	Metropolitan Land Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
20	Pakuwon Jati Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
21	Suryamas Dutamakmur Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>
22	Summarecon Agung Tbk	<i>safe</i>	<i>safe</i>	<i>safe</i>

Source: Processed Data, 2022

Based on table 2 , describes the conditions of the *Property and Real Estate Companies* for three consecutive years, namely 2018 -2022 based on the Zmijewski Model (*X- Score* ). During the study period, almost all companies were in the *safe zone* and the other companies were in the *distress zone*. The conditions in the Zmijewski Model (*X- Score* ) show that almost all companies experienced *X- Score* fluctuations during the study period. So even though the company is in the safe zone, sometimes the resulting *X - Score* is close to the *cut-off point* so that this condition is not good for companies that are already in the safe zone. However, this condition will be reversed if you look at it from the point of view of companies that are in a *distress zone* . If the resulting *X-Score* value is also close to the *cut off point* , this condition will be very good for the company because there is a greater possibility for the company to get out of the *distress zone* and move to the *safe zone* .

## B. Discussion

### 1. Comparison of Altman (Z-Score) and Zmijewski (X-Score) Model Predictions

Based on the calculation results obtained from the Altman model (*Z - Score* ) and the Zmijewski model (*X- Score* ), it can be seen the prediction results of financial distress from the 22 companies studied. The results shown from the two models show that there are differences in the value and prediction of the company's position, because between the two models there are differences in the ratios used, similarities, and cut-off points. However, among most of the differences in the prediction results, there are also 3 companies that have the same prediction results. Namely 3 companies are in the safe zone for three consecutive years .

results of the predictions from the Z-Score model and the X-Score model, it can be concluded that the financial distress predictions made by the two prediction models have different results on the condition of the companies that are the object of research. There were 3 companies that had the same predictions during 2018 -2022 , namely PT Alam Sutera Realty Tbk, PT Natura City Developments Tbk , and PT Pakuwon Jati Tbk . While the 19 companies had different results in 2018 -2020 20 . This is consistent with the results of previous research conducted by Achmad Syamsul Maarif (2019 ) that between the two models there is a significant difference because each model, both Altman (*Z- Score* ) and Zmijewski (*X - Score* ) uses ratios different so that the equation used is also different, and the *cut-off* point used is also different. This condition can be used as a benchmark for companies facing financial

difficulties, because these two models are complementary to one another. Basically, the Altman model (*Z- Score* ) looks at whether or not all activities and operational activities of the company are balanced compared to the assets it owns, so that if the total assets owned by the company are too large, it indicates that the company has not been able to utilize and manage asset turnover properly. Therefore, the higher the total assets owned by the company, the lower the *Z-Score*.

While the Zmijewski model (*X- Score* ) looks at the performance of a company and how much the company is able to pay its obligations. Therefore, the higher the company's debts, the higher the *X - Score* . Because the two models have different focus points, it is hoped that the company can anticipate financial difficulties not only from the aspect of how to manage assets owned for operational activities, but can also see from the aspect of the company's ability to pay its obligations. Therefore, according to the Zmijewski model the company is in a *safe zone* , but according to the Altman model it is still in a *distress zone*, it means that the company is good at paying its obligations but is still very bad at managing assets for the company's operations. So the company must evaluate and improve the performance of these aspects so that the company can be in the *safe zone* of each model. When the company is in the *safe zone* according to the two models, it means that the company is in optimal financial condition both in terms of asset management and fulfillment of company obligations. And vice versa, so that with the existence of these two models, the company can find out the financial aspects of the company that need to be evaluated so that the company does not experience financial difficulties. In addition, it can be used as a reference for companies so that they are not only based on one model, and make companies even wiser in making decisions so that companies avoid financial difficulties that result in bankruptcy.

Into bankruptcy from 2 models predicting financial distress. The results of the Altman model (*Z-Score*) financial distress prediction show that 14 companies are in *distress zone* , 6 companies are in the *gray zone* and 2 companies are in the *safe zone*, and in 2022 there are 9 companies that match the predictions of the Altman model (*Z-Score*) this proves that the predictions of the altman model (*Z-score*) in some of these companies proven accurate. And for the Zmijewski model (*X-Score*) there are 11 companies that match the predictions of the model, this proves that the Zmijewski model also proves to be accurate for predicting financial distress in companies.

## CONCLUSION

This study aims to predict and analyze financial difficulties using the Altman model (*Z- Score* ) and the Zmjewski model (*X- Score* ) in *Property* and *Real Estate companies* listed on the Indonesia Stock Exchange during the period 2018 -2020 . Based on the calculation and analysis results that have been carried out in the previous chapter, the following conclusions are obtained:



Based on the calculation of the Altman model (Z- Score ) and the Zmijewski model (X- Score ), the results are quite different for each company when analyzed using these two models. According to the Altman model (Z- Score ), there are 3 companies that are consistently in the *safe zone* during the period 2018 -2020 . Then there are 4 companies that are in the *gray zone* during the period 2018 -2020 . Furthermore, there are 12 companies that are always in a *distress zone* during the period 2018 - 2020 . Finally, there were 3 companies that fluctuated during the period 2018 - 2020 . Meanwhile, according to Zmijewski's model calculation (X- Score ), there were 19 companies that were consistently in the *safe zone* during the 2018 -2020 period . Meanwhile, there were 3 companies that fluctuated in the period 2018 -2020 . The highest Z-Score value in 2018-2020 was produced by PT Alam Sutera Realty and the company was always in the safe zone during the 2018 -2020 period . As for the lowest Z-Score value in 2018 produced by PT Bhuwanatala Indah Permai Tbk , in 2019 produced by PT Duta Anggada Realty Tbk and 2020 was generated by P T Modernland Realty Tbk . The lowest X-Score value which means the company is in a *safe zone* in 2018 was produced by PT Sentul City Tbk , and in 2019-2020 it was produced by PT Greenwood Sejahtera Tbk . Meanwhile , the highest X-Score value means that the company is in a *distress zone* in 2018 produced by PT Duta Anggada Realty Tbk , and in 2020 produced by PT Binakarya Jaya Abadi Tbk . Basically , the Altman Z-Score model looks at whether or not all the activities and operational activities of the company are balanced compared to the assets it owns, so that if the total assets owned by the company are too large, it indicates that the company has not been able to utilize and manage asset turnover properly. Therefore, the higher the total assets owned by the company, the lower the Z-Score. While the Zmijewski X-Score model looks at the performance of a company and how much the company is able to pay its obligations. Therefore, the higher the company's debts, the higher the X-Score.

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