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DEVELOPMENT OF PROPERTY AND REAL ESTATE COMPANIES: Z-SCORE METHOD APPROACH

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ABSTRACT

This research aims to evaluate the development of public companies in the property and real estate sector from 2017 to 2020. The method used to assess such development is the Z-score model. The Z-score model classifies the company into three conditions: safe, gray, and distress. The study showed that of the 40 companies studied, most companies, above 72.5%, fall into the safe category. Companies that fall into the gray area category are second, and companies in the distress category are third. From 2017 to 2020, companies that fall into the safe category tend to decline. On the other hand, companies that fall into distress tend to increase.

***Keywords*:** *property & real estate, Z-score model, distress*

1. INTRODUCTION

When a new company is established, its founder hopes that its company continues to grow and last a long time. The problem is that not all companies can thrive and survive for a long time. Many factors can cause a company to fail and close its business. These factors can come from the internal and external of the company. The company's internal problems can stem from its inability to perform its management functions properly. The company's external issues can arise from the competition with domestic and foreign competitors, government policies, the business climate in the company's industry, and globalization. However, from various backgrounds of the company's problems, the incompetence factor of the company's management is usually the main problem [1] [2].

A company needs to earn profits to grow — the greater the profit, the faster the company's development. Instead, the loss will decrease its survival. The greater the loss, the quicker the company went into bankruptcy. So, whatever the cause of the problem, it will impact its financial performance. This financial condition becomes problematic, leading to bankruptcy if not handled appropriately and adequately. In difficult financial situations, the company will seek external financing in loans. If a company gets a loan, the company's next challenge is to repay the loan along with other obligations. Conversely, under challenging conditions, it may be that the company actually experiences difficulty obtaining a loan or even if it gets a loan but with higher borrowing costs that further worsen the company's condition. Mariano, Izadi & Pratt [2] show that relatively high borrowing costs in states of weak capital structure will increase the company's risk.

Based on the description above, the company's ability to detect the company's financial condition to avoid bankruptcy is crucial for a company. Many studies offer a model for predicting default or business failure [3] [4]. One of the models used was the model introduced by Altman under the name *Z-Score model,* which in its course made several revisions to its original model [1] [3] [5] [6].

Data from the BPS website shows that the property and *real estate* sectors' role in GDP is about 10 percent. The growth of this sector experienced growth - 3.3 percent in 2020. The growth is down sharply from 2019 growth, around 5.8 percent. The growth of this sector has a pattern that tends to be the same as national economic growth. This sector is crucial because it reflects a person's well-being, namely a place to live. Therefore, this study wants to see how the condition of companies that provide shelter for their residents. This study seeks to see what happens to Indonesia's property and real estate sectors when there is a covid-19 pandemic in 2020? Is the company experiencing financial difficulties (financial distress) in 2020 only because of the covid-19 pandemic alone or because it already had problems? The duration of this study is relatively limited, from 2017 to 2020, because it focuses on the company's development ahead and the state of the Covid-19 pandemic.

2. RESEARCH METHOD

Financial distress is when a company faces difficulties meeting its debt obligations to creditors [4]. Financial distress will be higher in line with increased business risk and debt. If not handled properly, then financial distress will lead to the company's bankruptcy. Bankruptcy is often also termed business failure, insolvency, and fraud [1].

It should be realized that financial distress does not occur suddenly because the company will show symptoms or signs before. Therefore, an early warning of financial distress can give the company time and opportunity to handle it, such as maintaining a better financial structure, more efficient operations, improving information transparency, to anticipate and avoid higher financial distress, which in turn can lead to the bankruptcy of the company [2].

Most companies fail for various reasons, but management mismatches are usually at the heart of the problem [1]. Management competency is following the conclusions in many studies highlighting the impact of corporate governance on corporate distress, which shows that there is a significant association between corporate governance and financial distress [7] [8]

Formal aggregate studies dealing with omens of business failure began to emerge in the 1930s [5]. Anjum [3] shows a list of several researchers who have contributed to developing models for predicting bankruptcy or business failure.

Altman [5] uses financial ratios derived from a company's financial statements. From his studies, he obtained about twenty-two (22) variables (ratios) that could be used as indicators of troubled companies in the past. Furthermore, these variables are classified into five standard ratios: liquidity, profitability, leverage, solvency, and activity. To arrive at the final profile of the selected variable, the following procedures are performed: (1) statistically significant observations of various alternative functions, including the determination of the contribution of each independent variable; (2) evaluation of inter-correlations between relevant variables; (3) observation of the accuracy of predictions; and (4) judgment of the analyst.

Altman [5] applied multiple discriminant analysis (MDA) in *Z-Score* calculations. MDA is a statistical technique used to classify an observation into several groups according to its characteristics. Altman divides into two groups: companies that go bankrupt and companies that do not go bankrupt. The original model was based on companies listing their shares on the stock exchange companies in the manufacturing industry sector. The model is [3] [5]:

$$\mathbf{Z = 0.012\ X_1 + 0.014\ X_2 + 0.033\ X_3 + 0.006\ X_4 + 0.999\ X_5} \quad \text{…….. (1)}$$

Interestingly, Altman did not include the model (1) above as an early model when reviewing it from the initial model to its revision [1], [6]. Therefore, it is not surprising that Altman's early model was cited by other authors differently, using the following equations (1) or equations (1a):

$$\mathbf{Z = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 1.0\ X_5} \quad \text{…….. (1a)}$$

Description:
X_1 = *Working Capital* / *Total Assets*
X_2 = *Retained Earnings* / *Total Assets*
X_3 = *Earnings Before Interest and Taxes* (EBIT) / *Total Assets*
X_4 = *Market Value of Equity* / *Book Value of Total Liabilities*
X_5 = *Sales* / *Total Assets*
Z = *Overall Index or Score*

In 1983, Altman developed a revised Z-Score Model for companies that were not issuers on the stock exchange, thus replacing the *market value* with a book *equity* value. The revised model is as follows [1] [3] [6]:

$$\mathbf{Z' = 0.717\ X_1 + 0.847\ X_2 + 3.107\ X_3 + 0.420\ X_4 + 0.998\ X_5} \quad \text{……. (2)}$$

In 1993, Altman modified its model used for the open manufacturing sector. One revision is to eliminate variable X_5 (sales/ total assets) to minimize the potential impact on sensitive industries if asset *turnover* is incorporated into its model [3], [6]. The revision has also changed the company's classification criteria based on the terms of its score. The revised model is as follows [3] [6]:

$$\mathbf{Z'' = 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4} \quad \text{…….. (3)}$$

Altman, Hartzell, and Peck [1] have applied the *Z-Score* model to developing countries' companies by adding equation (2) with a constant value of 3.25 to standardize *the score* with a *score* equal to the D (failed) bond rating:

$$\mathbf{Z'' = 3.25 + 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4} \text{ …. (4)}$$

The conclusions of the development of the *Z-Score* model are shown in Table 1 [1] [3] [6]. Table 1 shows changes in the Z-Score number (cut-off scores) in the category of insolvent (distress), not bankrupt (safe), and gray in line with changes in the Z-Score model used.

Table 1. Development of the Z-Score Model

Variable	**Z-Score Model**			
	Original	**Revised**		
	1968	**1983**	**1993**	**1995**
Constant				3.25
X1	1.21	0.717	6.56	6.56
X2	1.41	0.847	3.26	3.26
X3	3.30	3.107	6.72	6.72
X4	0.60	0.420	1.05	1.05

X5	0.99	0.998		
		Z-Numbers		
Safe	> 2.67	> 2.90	> 2.60	> 5.65
Gray	1.81 – 2.67	1.23 – 2.90	1.10 – 2.60	4.15 – 5.65
Distress	< 1.81	< 1.23	< 1.10	< 4.15

The population in this study is property and real estate sector companies in Indonesia. This research sample is a property and real estate sector company whose shares are listed on the Indonesia Stock Exchange (IDX) during 2017-2020. Sampling techniques are done through purposive sampling. From property and real estate sector companies whose shares are listed on the Indonesia Stock Exchange (IDX) during 2017 - 2020.

The data analysis technique used is descriptively quantitative to predict Z-Score using a model introduced by Edward I. Altman. Z-Score is obtained from the information of four ratios, among others, working capital/ total assets (X_1), retained earnings / total assets (X_2), EBIT / total assets (X_3), and a book value of equity/book value of debt (X_4). The four ratios are multiplied by the parameters specified in Altman's Z-Score revision model as follows:

$$\mathbf{Z" = 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4} \quad \text{……. (5)}$$

In addition to using equations (6), the study will also apply equations (2) to non-manufacturing sectors in developing countries such as [1]:

$$\mathbf{Z" = 3.25 + 6.56\ X_1 + 3.26\ X_2 + 6.72\ X_3 + 1.05\ X_4} \quad \text{…..... (6)}$$

3. RESULTS & DISCUSSIONS

The subjects of this study are property and *real estate* sector companies listed on the Indonesia Stock Exchange (IDX) during 2017-2020 and have complete financial statements. Nine companies of the 49 property and real estate sector companies listed on the IDX do not have complete financial statements from 2017 to 2020. Therefore, the study used data from 40 companies.

In this study, the data was processed using Altman's Z-Score formula. The results of the calculation can be seen in Table 2. This table shows the development of Z-Score numbers based on equations 5 (manufacturing model) and 6 (manufacturing model in developing countries) of 40 property and real estate companies listed on the IDX. From the table, the forty companies can be classified into three groups of numbers, namely, very financially troubled or tend to go bankrupt (distress); inconclusive area (gray); and not bankrupt or not threatened with bankruptcy (safe).

The non-manufacturing model shows that companies experiencing financial distress increased during 2017-2020. On the other hand, companies that do not experience financial problems (safe) have declined since 2018. The rest are companies that fall into the gray category whose numbers tend to decline from 2017 to 2019 but rise in 2020.

Thus, the Covid-19 pandemic period in 2020 has increased the number of companies that fall into *distress* and *gray.* A similar picture also occurs when using non-manufacturing models in

developing countries. The number of companies that fall into the safe category from 2017 to 2020 is the same. The difference is in the number of companies that fall into distress and gray; the number is different in 2019 and 2020. The number of distressed companies increased from 1 in 2018 to 2 in 2019.

Table 2. Z-Score Numbers, 2017 – 2020

No	Companies	Non-Manufacturing Model				Non-Manufacturing Model in Developing Countries			
		2017	2018	2019	2020	2017	2018	2019	2020
1	PT Agung Podomoro Land Tbk.	2.30	1.55	2.74	2.43	5.55	4.80	5.99	5.68
2	PT Bekasi Asri Pemula Tbk.	6.40	7.00	25.38	23.40	9.65	10.25	28.63	26.65
3	PT Bekasi Fajar Industrial Estate	5.74	6.59	7.03	5.14	8.99	9.84	10.28	8.39
4	PT Binakarya Jaya Abadi Tbk.	4.35	4.02	1.43	0.26	7.60	7.27	4.68	3.51
5	PT Bhuwanatala Indah Permai Tbk.	2.35	2.05	2.18	2.82	5.60	5.30	5.43	6.07
6	PT Bukit Darmo Property Tbk.	-0.30	0.69	-0.48	-0.78	2.95	3.94	2.77	2.47
7	PT Sentul City Tbk.	3.44	3.20	2.69	1.68	6.69	6.45	5.94	4.93
8	PT Bumi Serpong Damai Tbk.	5.29	4.70	5.32	4.32	8.54	7.95	8.57	7.57
9	PT Ciputra Development Tbk.	3.32	3.46	3.58	3.23	6.57	6.71	6.83	6.48
10	PT Duta Anggada Realty Tbk.	1.86	1.43	0.93	0.43	5.11	4.68	4.18	3.68
11	PT Intiland Development Tbk.	1.22	1.42	1.79	1.02	4.47	4.67	5.04	4.27
12	PT Duta Pertiwi Tbk.	7.98	7.39	7.82	7.15	11.23	10.64	11.07	10.40
13	PT Megapolitan Developments Tbk.	4.62	4.24	3.90	2.84	7.87	7.49	7.15	6.09
14	PT Fortune Mate Indonesia Tbk.	9.14	5.78	5.18	5.38	12.39	9.03	8.43	8.63
15	PT Aksara Global Development Tbk.	5.73	6.25	5.81	5.26	8.98	9.50	9.06	8.51
16	PT Perdana Gapuraprima Tbk.	7.74	8.52	7.35	6.67	10.99	11.77	10.60	9.92
17	PT Greenwood Sejahtera Tbk.	16.81	15.74	14.65	16.26	20.06	18.99	17.90	19.51
18	PT Indonesian Paradise Property T	2.03	2.21	7.31	4.16	5.28	5.46	10.56	7.41
19	PT Jaya Real Property Tbk.	4.50	4.47	5.04	5.34	7.75	7.72	8.29	8.59
20	PT Kawasan Industri Jababeka Tbk.	5.63	5.61	5.62	5.49	8.88	8.86	8.87	8.74
21	PT Eureka Prima Jakarta Tbk.	38.28	42.08	47.79	47.81	41.53	45.33	51.04	51.06
22	PT Lippo Cikarang Tbk.	6.38	11.34	12.63	3.14	9.63	14.59	15.88	6.39
23	PT Lippo Karawaci Tbk.	4.73	5.00	4.40	2.10	7.98	8.25	7.65	5.35
24	PT Modernland Realty Tbk.	2.76	2.69	-1.45	-2.97	6.01	5.94	1.80	0.28
25	PT Metropolitan Kentjana Tbk.	6.38	7.73	6.22	5.45	9.63	10.62	9.47	8.70
26	PT Mega Manunggal Property Tbk.	8.48	8.47	7.71	8.33	11.73	11.72	10.96	11.58
27	PT Metropolitan Land Tbk.	5.92	6.52	5.93	6.44	9.17	9.77	9.18	9.69
28	PT Metro Realty Tbk.	8.51	5.99	2.31	1.04	11.76	9.24	5.56	4.29
29	PT City Retail Developments Tbk.	5.24	7.28	4.77	2.65	8.49	10.53	8.02	5.90
30	PT Indonesia Prima Property Tbk.	20.66	12.51	11.02	8.13	23.91	15.76	14.27	11.38
31	PT Plaza Indonesia Realty Tbk.	2.16	2.25	16.01	12.42	5.41	5.50	19.26	15.67
32	PT PP Properti Tbk.	3.17	2.95	2.20	2.08	6.42	6.20	5.45	5.33
33	PT Pudjiadi Prestige Tbk.	4.30	5.40	5.69	5.19	7.55	8.65	8.94	8.44
34	PT Pakuwon Jati Tbk.	4.08	5.27	5.96	5.04	7.33	8.52	9.21	8.29
35	PT Ristia Bintang Mahkotasejati T	1.93	3.65	3.33	2.71	5.18	6.90	6.58	5.96
36	PT Roda Vivatex Tbk.	14.28	16.01	13.57	16.07	17.53	19.26	16.82	19.32
37	PT Pikko Land Development Tbk.	6.43	5.45	3.59	3.20	9.68	8.70	6.84	6.45
38	PT Suryamas Dutamakmur Tbk.	5.07	5.90	6.22	6.46	8.32	9.15	9.47	9.71
39	PT Summarecon Agung Tbk.	2.55	2.62	2.65	2.35	5.80	5.87	5.90	5.60
40	PT Agung Semesta Sejahtera Tbk.	6.15	15.95	15.28	23.83	9.40	19.20	18.53	27.08

The gray category shows that the number of companies in 2019 is the same as in 2018, 6 companies. Furthermore, the number of companies increased in 2020 to 7 companies. The difference is due to two companies, namely, PT Duta Anggada Realty and PT Intiland Development. In the calculations using equation (6), (a) distress of PT Duta Anggada Realty only occurred in 2020, while in 2019 became gray; (b) PT Intiland Development does not experience distress again in 2020, but rather gray.

There are several records of both tables above. First, PT Bukit Darmo Property has always experienced financial problems from 2017 – to 2020. Second, there are 2 (two) companies (PT Binakarya Jaya Abadi and PT Duta Anggada Realty) experience financial difficulties after being in the gray area. PT Intiland Development is also included in equation 6, but not until there is *distress* in 2020 when using equation 7. Nevertheless, the condition of PT Intiland Development remains less good because it is in the *gray* area from 2017 to 2020. Third, there is 1 (one) company (PT Modernland Realty) is experiencing financial problems but not preceded by conditions in the gray area. Fourth, there are 4 (four) companies (PT Bhuwanatala Indah Permai, PT Indonesian Paradise Property, PT Plaza Indonesian Realty, and PT Ristia Bintang Mahkota Sejati) recovered from the condition of the gray area. Fifth, there are 2 (two) companies (PT Sentul City and PT Lippo Karawaci) entered the gray area during the Covid-19 pandemic, namely in 2020. Previously, both companies were still in relatively healthy condition. Sixth, there are 2 (two) companies (PT Metro Realty and PT PP Properti) have been in a gray state since 2019. Thus, these two companies had entered a gray area before the covid-19 pandemic. Seventh, there are 2 (two) companies (PT Agung Podomoro Land and PT Summarecon Agung) have recovered from the condition of the gray area, but finally, in 2020, re-enter the gray area again. The rest, about 25 (twenty-five) companies, did not experience financial problems in 2017-2020. Thus, 62.5 percent of the 40 (forty) *property* and real estate companies were selected in the study whose conditions were relatively stable and healthy.

Given that Altman's Z-Score predicts the likelihood of going bankrupt, the study will highlight companies whose Z-Score numbers fall into the gray and distress categories. There are 15 property and real estate companies that experienced or have experienced Z-Score numbers in the gray and financial distress category in 2017 - 2020.

PT Agung Podomoro Land (PT APL) was in a gray condition in 2017 and 2018. PT APL's financial situation recovered in 2019. However, PT APL was experiencing a gray condition again in 2020. Although the ratio of EBIT to total assets is still positive, the ratio tends to decrease. In addition, the percentage of retained earnings to total assets is also likely to decrease.

PT Binakarya Jaya Abadi (PT BJA) is in a gray condition in 2019 and experienced financial problems in 2020. It is shown by the Z-Score numbers that tend to decrease from 2017 to 2020. The decrease in Z-Score figures is due to the ratio of working capital to total assets, retained earnings to total assets ratio, EBIT to total assets ratio, and the book value of equity to book value of liabilities which decreased from 2017 to 2020.

PT Bhuwanatala Indah Permai (PT BIP) experienced gray conditions from 2017 to 2019. However, by 2020, its financial condition has recovered. The recovery in the financial situation in 2020 due to the ratio of EBIT to total assets tends to increase from the magnitude of the negative ratio in 2017 and 2018, then to be slightly positive in 2019. The highest peak ratio was in 2020. Although this ratio tends to improve, some records will affect its development in the future; among others, the ratio of retained earnings to total assets tends to decrease from 2017.

PT Bukit Darmo Property (PT BDP) experienced financial problems from 2017 to 2020. His Z-Score has experienced negative signs since 2019. It is seen in the ratio of EBIT to total assets, the ratio of working capital to total assets, and the ratio of retained earnings to total assets, which is always negative from 2017 to 2020.

PT Sentul City (PT SC) experienced conditions in the gray area in 2020. The development was accompanied by a decrease in working capital to total assets, retained earnings to total assets ratio, EBIT to total assets ratio, and book value of equity to book value of liabilities ratio from 2017 to 2020.

PT Duta Anggada Realty (PT DAR) experienced conditions in the gray area in 2017 and 2018. Furthermore, experiencing financial distress in 2019 and 2020. It is indicated by a decrease in the EBIT ratio to total assets. It experienced a negative ratio in 2019 and 2020. The ratio of working capital to total assets is negative and tends to enlarge.

PT Intiland Development (PT ID) experienced conditions in the gray area from 2017 to 2019 and experienced financial distress in 2020. In 2020, all four ratios decreased, bringing the Z-Score to the distress area.

PT Indonesian Paradise Property (PT IPP) experienced gray conditions in 2017 and 2018. The company is experiencing conditions in the gray area because working capital to total assets, retained earnings to total assets, and EBIT to total assets is relatively low. Even the ratio of working capital to total assets is experiencing negative signs. However, working capital to total assets retained earnings to total assets ratio, EBIT to total assets ratio, and book value of equity to book value of total liabilities increased relatively high so that financial conditions recovered in 2019.

PT Lippo Karawaci (PT LK) experienced gray conditions in 2020. The company's financial performance is relatively unfavorable, as seen in the ratio of EBIT to total assets that experienced negative signs in 2017, 2019, and 2020. However, the Z-Score from 2017 to 2019 is still safe mainly because the ratio of working capital to total assets is relatively high. However, because the ratio of working capital to total assets tends to decrease and the book value of equity to book value of total liabilities falls sharply in 2020, the Z-Score in 2020 is gray.

PT Modernland Realty (PT MR) experienced financial difficulties in 2019 and 2020. It is seen in the ratio of EBIT to total assets in 2018, which is very low and even becomes negative in 2019 and 2020. Likewise, the ratio of working capital to total assets is relatively low and becomes negative in 2019 and 2020. It was coupled with the book value of equity to the book value of total liabilities, which is decreasing and far below 100%.

PT Metro Realty (PT MR) experienced gray conditions in 2019 and 2020. PT MR's poor financial performance can be seen in the ratio of EBIT to total assets that are negative, even greater from 2017 to 2020. The ratio of retained earnings to total assets is also likely to decline and, in fact, become negative in 2019 and 2020. In addition, the ratio of working capital to total assets is relatively likely to decrease. The thing that makes the Z-Score in 2017 and 2018 still relatively safe is mainly due to the relatively high ratio of the book value of equity to book value of liabilities. However, because the ratio tends to decrease, it pushes the Z-Score to be gray since 2019.

PT Plaza Indonesia Realty (PT PIR) experienced gray conditions in 2017 and 2018. Since 2019, the Z-Score has risen rapidly to safe areas, although the ratio of EBIT to total assets of total assets is likely to decline and experience negative signs in 2020.

PT PP Property (PT PPP) experienced gray conditions in 2019 and 2020. It is due to the downward trend of the four ratios, among others, the ratio of working capital to total assets; the ratio of retained earnings to total assets; the ratio of EBIT to total assets; and the ratio of the book value of equity to book value of liabilities.

PT Ristia Bintang Mahkotasejati (PT RBM) experienced gray condition in 2017. Furthermore, its financial condition recovered, which is in the safe area. The increase in Z-Score in the safe area is mainly due to the rise in the book value of equity to the book value of liabilities.

PT Summarecon Agung (PT SA) experienced a gray condition in 2017. After that, financial conditions recovered in 2018 and 2019. However, PT SA was experiencing gray conditions again in 2020. Gray's condition in 2017 is because all four financial ratios tend to be below.

4. CONCLUSIONS AND SUGGESTIONS

The study used two equations in calculating the Z-Score, equation (1) and equation (2). Both can be used to measure the non-manufacturing sector. The difference is equation (2) is primarily aimed at developing state companies. In the case of this study, both equations tended to have close to the same results. Only 2 out of 40 companies studied showed differences in outcomes from the two equations.

The covid-19 pandemic that began to enter Indonesia in March 2020 has affected the financial condition of most property and real estate companies. Of all companies that experienced a decrease in performance, there were five companies (using equation (1)) or four companies (using equation (2)) that experienced financial distress in 2020. Nevertheless, there are still ten companies whose financial condition has improved.

This study shows that (1) companies that experience conditions in gray areas can still recover, but it could also be worse; (2) Z-Score in safe areas does not necessarily mean healthy financial conditions. Companies that experience negative EBIT (loss) still have the Z-Score in the safe category because many other components cover it; (3) companies that experience financial difficulties (financial distress) throughout 2017 - 2020 are PT Bukit Darmo Property.

This research suggests that: a) the company constantly monitors its financial ratios just in case it avoids gray and distress conditions; b) investors avoid shares of companies that experience gray and distress conditions, and c) subsequent studies use more comprehensive data to ascertain further whether the study's conclusions match those of the study.

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