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### Analysis of Financial Conditions with the Altman Z-Score Method to Predict Bankruptcy (Case Study at PT Bintang Grana Darma)

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**Abstract.** The development of tourism in Lombok island leads to increasingly fierce business competition in the field of hospitality services. The hotels are unable to compete due to a decrease in room occupancy rates which ultimately leads to bankruptcy. This study was conducted to determine the financial condition of *PT Bintang Grana Darma* with the Altman Z-Score method to predict the bankruptcy in the period of 2014-2018. The study approach used was a quantitative descriptive approach. This study used secondary data in the form of financial statement data for the period 2014-2018. Financial condition was measured using a modified version of the Altman Z-Score financial ratio. The four ratios used are Working Capital to Total Assets, Retained Earnings to Total Assets, EBIT to Total Assets, Book Value of Equity to Book Value of Total Debt. Based on the results of the Altman Z-Score analysis, *PT Bintang Grana Darma*'s financial condition is not bankrupt or in a healthy condition. It can be seen that *PT Bintang Grana Darma* produced the highest Z-Score of 11.2727 in 2018, the lowest Z-Score of 7.9764 in 2017 or the average Z-Score of 8.9807 which is above the point cut-off of Z- 2.60 falls into the non-bankrupt criteria.

**1. Background**  
Bankruptcy can be interpreted as a company in carrying out operations to achieve success [1]. Bankruptcy does not suddenly occur, financial difficulties that continue will be difficult for the company to maintain in the future. The company must be earlier in conducting the analysis in order to make the company does not increase bankruptcy. Financial statements can be used by companies to do analysis. One method of financial ratio analysis that can be used to predict bankruptcy is the Z-Score analysis. Z-Score analysis combines several financial ratios and each ratio is given a different weight. From this calculation will produce a value of money that can show the company's finances which are grouped into three categories, namely: bankrupt, gray area, and not bankrupt.

*PT Bintang Grana Darma* or better known as Hotel Lombok Garden is one of the hotels in the city of Mataram, West Nusa Tenggara Province. The development of tourism in Lombok island over the past few years developed quite significantly. This number can be seen from the Room Occupancy Rate (ROR) the number of guests staying in star hotels (3, 4 and 5) in 2017 received 940,777 people, consisting of 740,717 domestic guests and 200,060 foreign guests [2]. The number of tourists from abroad also led to the emergence of many star hotels and non-star hotels in West Nusa Tenggara. For the past five years the number of hotels in West Nusa Tenggara has calculated a significant increase. In

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### 1. Background

Bankruptcy can be interpreted as a company in carrying out operations to achieve success [1]. Bankruptcy does not suddenly occur, financial difficulties that continue will be difficult for the company to maintain in the future. The company must be earlier in conducting the analysis in order to make the company does not increase bankruptcy. Financial statements can be used by companies to do analysis. One method of financial ratio analysis that can be used to predict bankruptcy is the Z-Score analysis. Z-Score analysis combines several financial ratios and each ratio is given a different weight. From this calculation will produce a value of money that can show the company's finances which are grouped into three categories, namely: bankrupt, gray area, and not bankrupt.

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2017 the number of hotels in West Nusa Tenggara took 947 hotels, with details of 882 non-star hotels and 65 star hotels [2].

The more hotels in West Nusa Tenggara, the tougher competition in the field of hospitality services. This has an impact on the purpose of the hotel is to make a profit with guaranteed continuity. PT Bintang Grana Darma's revenue in the last five years has improved the decline from 2014-2018. The natural disaster of the earthquake that struck Lombok Island in August 2018 also had an impact on hotel occupancy rates on Lombok Island. West Nusa Tenggara, Chairman of the Indonesian Hotel and Restaurant Association, Lalu Abdul Hadi Faishal said that after the earthquake disaster, hotel occupancy decreased by 70% [3]. Based on this background, the purpose of this study is to determine the financial condition of PT Bintang Grana Darma by using the Altman Z-Score method to predict bankruptcy.

#### 1 Literature Review

Financial statement analysis is the preparation of financial statements based on relevant data, and is carried out with the correct accounting and valuation procedure so that the actual financial condition of the company will be seen [4]. The purpose of the analysis of financial statements is a very important tool to obtain information relating to the financial position on the results that have achieved by the company concerned [5]. Bankruptcy is usually interpreted as a failure of the company in running the company's operations in gaining the profits [5]. Edward I Altman was a researcher who discovered a Z-Score analysis model for the first time. The analysis method is also known as Multiple Discriminant Analysis (MDA). The method is used by Altman to measure the magnitude of the coefficients of each independent variable used to predict the possibility of bankruptcy in a company. However, the first Altman analysis model can only be applied to companies engaged in large-scale public manufacturing [6]. The use of the Altman model as a measure of bankruptcy performance is not permanent or stagnant but rather evolves over time, where the testing and discovery of the model continue to be extended by Altman to its application not only to public manufacturing companies but includes non-public manufacturing companies, non-manufacturing companies, and corporate bond companies [7].

#### 3. Research Methods

This research uses quantitative data types. The data source used in this study is a secondary data source. Data collection procedures in this study are documentation, with the research sample in the form of a statement of financial position (balance sheet) and profit/loss statement of PT Bintang Grana Darma for the period 2014-2018. The analysis technique used in research is quantitative descriptive analysis, where after the data is obtained and processed, the data is analyzed and compared so that it can be useful for researchers. In this research the focus is:

- 1) Working Capital to Total Assets ( $X_1$ ), used to measure the company's ability to generate working capital from total assets owned by the company.
- 2) Retained Earnings to Total Assets ( $X_2$ ), used to measure the company's ability to generate retained earnings from total assets owned by the company.
- 3) Earnings Before Interest and Tax to Total Assets ( $X_3$ ), used to measure the company's ability to generate operating profits from the total assets owned by the company.
- 4) Book Value of Equity to Book Value of Total Debt ( $X_4$ ), used to measure a company's ability to meet obligations, especially its long-term obligations with the book value of equity owned by a company

The four ratios have a relationship and will be used in the analysis of PT Bintang Grana Darma's financial condition using the modified version of the Altman Z-Score formula as follow:

$$Z = 6,56X_1 + 3,26X_2 + 6,72X_3 + 1,05X_4$$

To analyze the financial condition of PT Bintang Grana Darma by using a modified version of the Altman Z-Score formula, the analysis procedures that will be carried out are:

- 1) Calculate the Working Capital to Total Assets (X1) ratio, using the formula:

$$X_1 = \frac{\text{Working Capital}}{\text{Total Asset}}$$

- 2) Calculate the ratio of Retained Earning to Total Assets (X2), using the formula:

$$X_2 = \frac{\text{Retained Earnings}}{\text{Total Asset}}$$

- 3) Calculate the ratio of Earning Before Interest and Tax to Total Assets (X3), using the formula:

$$X_3 = \frac{\text{Earning Before Interest and Tax}}{\text{Total Asset}}$$

- 4) Calculate the ratio of Book Value of Equity to Book Value of Total Debt (X4), using the formula:

$$X_4 = \frac{\text{Book Value of Equity}}{\text{Book Value of Total Debt}}$$

With the cut-off point as follows:

- Not bankrupt (The company is in good health) =  $Z > 2.60$
- Gray area (Cannot be determined whether healthy or bankrupt) =  $1.10 < Z < 2.60$
- Bankrupt (Potentially bankrupt company) =  $Z < 1.10$

#### 4. Result and Discussion

##### 4.1 Ratio X<sub>1</sub> (Working Capital : Total Asset)

This ratio shows the company's ability to generate net working capital from the total assets owned by the company. Net working capital is obtained based on a calculation of the amount of current assets minus the amount of current debt. If the company has net working capital that is positive, then the company will not experience difficulties in fulfilling its obligations. Following are the results of the calculation of the ratio of working capital to total assets of the company over the past five years, which are presented in Table 1 below:

**Table 1.** Ratio Working Capital to Total Asset

No.	Year	Working Capital (Rp)	Total Asset (Rp)	Ratio Result
1	2014	6.527.307.151,79	28.585.977.504,33	0,2283
2	2015	7.907.556.793,36	30.259.114.998,59	0,2613
3	2016	4.855.902.595,20	32.343.241.901,37	0,1501
4	2017	5.773.140.896,94	34.690.486.870,84	0,1664
5	2018	5.750.509.054,05	34.262.033.725,57	0,1678

##### 4.2 Ratio X<sub>2</sub> (Retained Earnings : Total Asset)

This ratio shows the company's ability to generate retained earnings from the total assets owned by the company. Retained earnings is the amount of profit that is not distributed to shareholders in the form of dividends used for company development. The lower the value of the ratio of retained earnings to total assets, the smaller the role of retained earnings to the total assets of the company so that the probability of the company experiencing financial distress is higher. The following results of the calculation of the ratio of retained earnings to total assets of the company over the past five years are presented in Table 2 below:

**Table 2.** Ratio Retained Earnings to Total Asset

No	Year	Retained Earnings (Rp)	Total Asset (Rp)	Ratio Result
1	2014	7.465.805.728,05	28.585.977.504,33	0,2612
2	2015	9.285.595.141,28	30.259.114.998,59	0,3069
3	2016	10.909.274.114,55	32.343.241.901,37	0,3373
4	2017	12.502.607.007,98	34.690.486.870,84	0,3604
5	2018	14.063.635.259,58	34.262.033.725,57	0,4105

#### 4.3 Ratio $X_3$ (Earnings Before Interest and Tax : Total Asset)

The ratio used to describe the ability of a company to generate operating profit from the total assets owned by the company. The intended operating profit is operating profit before being burdened with payment of interest and tax expense. The smaller the value of the ratio reflects that the company's ability to generate profits before interest and taxes from the assets used is smaller so that the probability of the company against financial distress is higher. Following are the results of the calculation of the EBIT ratio to the total assets of the company over the past five years which are presented in Table 3 below:

**Table 3.** Ratio EBIT to Total Asset

No	Year	EBIT (Rp)	Total Asset (Rp)	Ratio Result
1	2014	2.358.067.425,98	28.585.977.504,33	0,0825
2	2015	2.259.798.030,25	30.259.114.998,59	0,0747
3	2016	2.064.331.201,81	32.343.241.901,37	0,0638
4	2017	2.016.530.853,74	34.690.486.870,84	0,0581
5	2018	1.981.525.753,49	34.262.033.725,57	0,0578

#### 4.4 Ratio $X_4$ (Book Value of Equity : Book Value of Total Debt)

This ratio illustrates the ability of a company to meet obligations, especially long-term obligations with the book value of equity owned by the company. The book value of equity is obtained from the entire amount of equity. The book value of equity provides information about the value of the resources owned by the company. While the amount of the book value of liabilities is obtained from the sum of current liabilities and long-term liabilities. If the value of the ratio is negative, indicating the smaller ability of the company to meet its obligations from equity, where the obligation includes short-term and long-term obligations so that the probability of financial distress for the company is higher. Following are the results of the calculation of the ratio of book value of equity to the book value of corporate debt for the last five years, which are presented in the Table below:

**Table 4.** Ratio Book Value of Equity to Book Value of Total Debt

No.	Year	Book Value of Equity (Rp)	Book Value of Total Debt Rp)	Ratio Result
1	2014	23.815.805.728,05	4.770.171.776,28	4,9927
2	2015	25.635.595.141,28	4.623.519.857,31	5,5446
3	2016	27.259.274.114,55	5.083.967.786,82	5,3618
4	2017	28.852.607.007,98	5.837.879.862,86	4,9423
5	2018	30.413.635.259,58	3.848.398.466,00	7,9029

#### 4.5 Analysis Result of Z-Score Altman

After all ratio calculations are known, the overall results of the ratio calculation are multiplied by their respective weights and summed according to the provisions of the Altman Z-Score calculation method, which shows how big the level of business failure of this company. The following results of the calculation of company ratio analysis for the past five years are presented in Table 5 below:



**Table 5.** The Calculation Result of Altman Analysis

No	Year	6,56X1	3,62X2	6,72X3	1,05X4	Z-Score	Z-Score Criteria
1	2014	1,4979	0,9454	0,5543	5,2423	8,2400	Not Bankrupt
2	2015	1,7143	1,1109	0,5019	5,8218	9,1489	Not Bankrupt
3	2016	0,9849	1,2210	0,4289	5,6299	8,2647	Not Bankrupt
4	2017	1,0917	1,3047	0,3906	5,1894	7,9764	Not Bankrupt
5	2018	1,1010	1,4859	0,3886	8,2981	11,2737	Not Bankrupt
The Highest		1,7143	1,4859	0,5543	8,2981	11,2737	
The Lowest		0,9849	0,9454	0,3886	5,1894	7,9764	Not Bankrupt
The Average		1,2780	1,2136	0,4529	6,0363	8,9807	

Based on the calculations that have been made, it is known that the financial condition of PT Bintang Grana Darma is in good health. PT Bintang Grana Darma produced the highest Z-Score in 2018 of 11.2737 then the lowest Z-Score of 7.9764 in 2017 or the average Z-Score of 8.9807 which is above the cut-off point off i.e.  $Z > 2.60$  falls into the criteria of not going bankrupt or the company is in good health.

One of the ratios that affect the assessment of bankruptcy predictions using the Altman model is the ratio of working capital to total assets. The ratio of working capital to total assets got the highest return in 2015 of 1.7143, while the lowest ratio in 2016 was 0.9849. The decrease in the ratio was due to the increase in current debt owned by the company where in 2015 the company's debt amounted to Rp 190,449,367.26 then in 2016 there was an increase in company debt of Rp 1,112,229,403.86, this must be anticipated so that liquidity capability could be more guaranteed. If the company has net working capital that is negative, then the company will experience difficulties in fulfilling its obligations. This was experienced by previous research on PT Titan Kimia Nusantara Tbk in 2010 resulting in a Z-Score below the cut-off point or in estimating bankruptcy. PT Titan Kimia Nusantara Tbk has four ratios with the lowest value in 2010, namely the ratio of working capital to total assets of -0.12, retained earnings to total assets of -0.3, debit to total assets of 0.0, and book value of equity to book value to total debt 0,3 [8].

The ratio of retained earnings to total assets obtained the highest ratio in 2018 of 1.4859 while the lowest ratio occurred in 2014 of 0.9454. This positive result must be maintained and improved by the company. The higher the value of the ratio of retained earnings to total assets, the greater the role of retained earnings to total assets of the company so that the probability of financial distress experienced by the company is lower. Previous research at PT Ace Hardware Indonesia Tbk was identified as being a healthy company or a company that was not experiencing financial difficulties, because it was caused by an increase in the ratio of retained earnings to total assets during 2011-2015 which increased so that the probability of companies experiencing financial distress became lower [9].

The results of the ratio of earnings before interest and tax to total assets obtained the highest ratio in 2014 of 0.5543 with a pretty good indication, while the lowest ratio occurred in 2018 of 0.3886. During 2014 to 2018, the ratio decreased but was still in the positive category and needed to be maintained. The greater the value of this ratio reflects that the company's ability to generate operating income from the assets used is greater so that the probability of the company against financial distress is lower. Suteja (2018), conducted research on PT Ace Hardware Indonesia Tbk, where the company is a healthy company or a company that is not experiencing financial difficulties, caused by the ratio of earnings before interest and tax to total assets during 2011-2015 is positive so that the probability companies experiencing financial distress becomes lower [9].

The book value of equity ratio to book value of total debt gets the highest ratio in 2018 of 8.22981 while the lowest ratio results occurs in 2017 of 5.1894. This positive result must be maintained and improved by the company. If the value of this ratio is positive, it indicates the greater ability of the company to meet its obligations from equity, so the probability of financial distress for the company is lower. Arsana and Syakbani (2017), conducted research on KSP Madani NTB, where KSP Madani NTB is a healthy company or a company that is not experiencing financial difficulties, caused by the ratio of

<sup>1</sup> book value of equity to book value of total debt during 2007-2016 an increase so that the probability of a company experiencing financial distress becomes lower [10].

Even though PT Bintang Grana Darma is not bankrupt or in good health, the company must remain vigilant in conducting its business. This method is only an early detection of the potential bankruptcy of a company from the financial side of the company, because bankruptcy of a company is not only seen from the financial or internal side, but many other factors that cause the bankruptcy of the company such as external factors that cause the company experiencing financial difficulties.

## 5. Conclusions

Based on the results of the analysis and discussion, it can be concluded that the financial condition of PT Bintang Grana Darma is not bankrupt or in a healthy condition. PT Bintang Grana Darma produced the highest Z-Score value of 11.2737 in 2018, the value of Z -The lowest score of 7.9764 in 2017 or the average Z-Score is 8.9807 which is above the cut-off point of  $Z > 2.60$  included in the non-bankrupt criteria (the company is in good health). This is due to the growth of assets and working capital of PT Bintang Grana Darma in good condition although the profit growth of PT Bintang Grana Darma is not in line with the growth of assets and working capital. The potential bankruptcy of a company can increase in the future if the company's management does not make improvements to the company's financial condition

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