

ANALYSIS OF BANKRUPTCY PREDICTION USING AL-MAN Z-SCORE AND SPRINGATE METHOD IN PT GARUDA INDONESIA TBK PERIOD 2015- 2019

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***ABSTRAT**---This study analyzes the condition of airlines in Indonesia. There are 15 airlines in Indonesia. However, only 3 companies have been listed on the Indonesia Stock Exchange. This study chose PT Garuda Indonesia Tbk to be the source of research using financial statement data from 2015 to 2019. There are several methods commonly used to analyze bankruptcy, the Altman Z-Score and Springate methods used in this study. The Altman Z-Score method states that PT Garuda Indonesia Tbk is in a gray area condition with an average Z value of 1,686 while the Springate method states that PT Garuda Indonesia is not bankrupt (healthy) with an average value of S 1,271.*

***Keywords**---bankruptcy, altman z-score, springate*

I. PRELIMINARY

Indonesia is an archipelago with 16,056 islands. So that transportation equipment is needed to reach from one island to another. Means of transportation in each country are different, transportation is also operated according to their respective routes and is subject to travel costs according to the transportation used. One of the means of transportation commonly used by the people of Indonesia is air transportation such as airplanes. The airline is a company that provides air transportation services for people who will travel long distances with domestic and overseas destinations.

There are 15 airlines operating in Indonesia. However, only 3 companies have been listed on the Indonesia Stock Exchange. One of them is PT Garuda Indonesia Tbk. PT Garuda Indonesia Tbk is the national and largest airline in Indonesia that serves flights with domestic and international destinations. PT Garuda Indonesia is also the only airline from Indonesia which is among the top ten best airlines in the world according to Skytrax. Garuda Indonesia has served 600 flights every day and has been named the World's Best Cabin Crew since 2014-2018.

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Table 1. List of Aviation Companies Listed on the Indonesia Stock Exchange

N	Company Code	Company Name
1	GIAA	PT Garuda Indonesia Tbk
2	CMPP	PT AirAsia Indonesia Tbk
3	IAT	PT Indonesia Transport & Infrastructure Tbk

Source: IDX, data processed, 2019

Passenger aircraft always fluctuate from year to year. The number of passengers in 2013 was 141,600,101 passengers, in 2014 an increase of 37% from the previous year, whereas in

2015 it decreased by 30%. In 2016 and 2017 the number of passengers continued to decline, at the end of 2017 the number of airplane passengers was only 21,155,271 passengers. Whereas in 2018 there was a slight increase in the number of passengers from the previous year by 42%. October 2019 the number of aircraft passengers has decreased again to 2,857,258 passengers.

Domestic flights have experienced a rise in airline ticket prices since mid-2018. This has happened because Indonesia signed the ASEAN Open Sky agreement which impacts on flights in Indonesia so that ASEAN countries can fly their aircraft in Indonesia. This also results in price competition between airlines so that the price of tickets abroad is cheap. In addition, PT Garuda Indonesia Tbk has 202 aircraft, but only 22 privately owned airplanes while the rest are leased. The high price of aviation fuel also has an impact on the price of airline tickets, because 45% of all airline operational components are for aviation fuel costs.

According to Arief Yuswanto Nugroho (2018) Bankruptcy is a condition in which a company is unable to manage profits in its operational activities, causing financial difficulties and eventually the company experiences a decline in profits so a bankruptcy event occurs.

Research in predicting bankruptcy of a company has been carried out by financial analysts with various methods to anticipate bankruptcy. Bankruptcy prediction tools that are often used are the Altman Z-Score Method in 1968, the Springate S-Score Method in 1978, and the Zmijewski X-Score Method in 1983. This study uses the Altman Z-Score method and the Springate S-Score to predict bankruptcy at PT Garuda Indonesia Tbk, because both of these methods have the best level of accuracy to predict bankruptcy. Based on the above, the authors are interested in conducting research with the title "**Bankruptcy Prediction Analysis using the Altman Z-Score and Springate Method at PT Garuda Indonesia Tbk Period 2015-**

2019".

II. LITERATURE REVIEW

Management can be defined as working with people who determine, interpret and achieve organizational goals by implementing organizational functions and carrying out planning, organizing, personnel or staffing, staffing, direction and organizational functions. leadership (controlling) (T. Hani Handoko, 2015: 10).

Financial management deals with three things, namely how to obtain funds to finance the business, how to manage these funds so that the company's goals are achieved, and how the company manages its assets efficiently and effectively (Kasmir, 2010: 6). According to Irham Fahmi (2011: 2) financial statements are information that describes the financial condition of a company, and further information can be used as a description of the company's financial performance.

According to Kasmir (2010: 93) financial ratios are the activities of comparing numbers in financial statements by dividing one number by another number. Comparisons are made between one component with another component in one financial statement. Comparable numbers can be numbers in one period or in different periods.

Hanafi (2014: 638) states that a company can be said to be bankrupt if the company experiences minor difficulties (such as liquidity problems), and to a more serious difficulty, namely solvable (debt is greater than assets).

Jauch and Glueck in Nafisatin, et al (2014) the factors causing bankruptcy are divided into three, namely:

1. General Factors

- a. Economic factors. Derived from inflation and price deflation, financial policies, interest rates, devaluation or revaluation of foreign currencies as well as foreign trade surpluses or deficits.
- b. Social Factors. Changes in people's lifestyles that affect the demand for products or services or those related to employees. Another factor occurred riots or chaos in the community.
- c. Technological Factors. The cost of using technology is borne by the company in its maintenance and implementation. Cost overruns will occur if the use of technology is not well planned, the system is not integrated and the user managers are less professional.
- d. Government Factors. Government policies by removing company and industrial subsidies, changing export and import tariffs on goods, new law policies for banks or labor and others.

2. External Factors

- a. Customer Factors. Companies must be able to identify the nature of consumers, create opportunities to get new customers, avoiding declining sales and preventing consumers from turning to competitors.
- b. Supplier / Creditor Factor. The strength lies in lending and determining the repayment period that depends on the creditor's confidence in the smooth operation of the company.
- c. Competitor Factor. This factor is an important factor that must be considered because it involves providing services to consumers.

3. Internal factors.

- a. Too much credit is given to the customer so that it causes arrears in payment until finally it cannot pay.
- b. Inefficient management, which is caused by lack of ability, experience, skills, adaptive attitude and initiative from management.
- c. Abuse of authority and fraud, which is often done by employees and even top managers even very detrimental especially those related to corporate finance.

Altman z-score method is one of the analysis tools used to predict bankruptcy of a company. This method was first introduced by an assistant professor, Edward I Altman, in his

1968 study at New York University. The Altman z-score method is formulated as follows:

$$Z = 1,2 X_1 + 1,4 X_2 + 3,3 X_3 + 0,6 X_4 + 1,0 X_5$$

Informating:

$Z = \text{bankruptcy index}$

$X_1 = \text{working capital/total asset}$

$X_2 = \text{retained earning/total asset}$

$X_3 = \text{earning before interest and taxes/total asset}$

$X_4 = \text{market value of equity/book value of total debt}$

$X_5 = \text{sales/total asset}$

Altman divides the calculation results from these values into three categories, namely:

- a. $Z < 1.8$ = The company is predicted to go bankrupt.
- b. $Z \ 1.8-2.99$ = The company is in the gray area (it cannot be determined whether healthy company or bankruptcy).
- c. $Z > 2.99$ = The company is predicted not to go bankrupt.

In 1993, Altman made a revision so that this model would not only be used for companies that had gone public but could also be used for private companies. The revised Medel Altman was formulated as follows:

$$Z' = 0,717 X_1 + 0,847 X_2 + 3,107 X_3 + 0,420 X_4 + 0,998$$

Informating:

$Z' = \text{bankruptcy index}$

$X_1 = \text{working capital/total asset}$

$X_2 = \text{retained earning/total asset}$

$X_3 = \text{earning before interest and taxes/total asset}$ $X_4 = \text{book value of equity/book value of total debt}$ $X_5 = \text{sales/total asset}$

The classification of a healthy and bankrupt company is based on the Altman Revised Z- Score model, namely:

- a. $Z' < 1.23$ = The company is predicted to go bankrupt.

- b. $Z' 1.23-2.9$ = The company is in the gray area (can not be determined whether healthy company or bankruptcy).
- c. $Z' > 2.9$ = The company is predicted not to go bankrupt.

In 1995, the Altman z-score model was revised again so that it could be applied to all types of companies both in developed and developing countries. The following Altman Z-Score models have been modified:

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

Informating:

Z'' = *bankruptcy index*

X_1 = *working capital/total asset*

X_2 = *retained earning/total asset*

X_3 = *earning before interest and taxes/total asset*

X_4 = *book value of equity/book value of total debt*

The classification of a healthy and bankrupt company is based on the Altman

Modification Z-Score value (1995), namely:

- a. $Z'' < 1.1$ = The company is predicted to go bankrupt.
- b. $Z'' 1.1-2.6$ = The company is in the gray area (it cannot be determined whether healthy company or bankruptcy).
- c. $Z'' > 2.6$ = The company is predicted not to go bankrupt.

Springate is a method invented by Gordon LV Springate in 1978. Following the procedure developed by Altman, Springate took 40 companies as a step-wise multiple discriminate analysis sample using 4 of 19 financial ratios that most contributed to the prediction of bankruptcy of the company so that a formula was formed which is called the Springate S-Score and determines the limit (standard) in the form of different weight values in each portion to predict the condition of the company whether it is potentially bankrupt or not

bankrupt. The Springate method can be formulated as follows:

$$S = 1,03 A + 3,07 B + 0,66 C + 0,4 D$$

Informating:

$$A = \text{Working Capital/Total Assets Ratio}$$

$$B = \text{Net Profit Before Interest/Total Assets Ratio} \quad C = \text{Net Profit Before Taxes/Current Liabilities} \quad D = \text{Sales/Total Assets}$$

The classification of a healthy and bankrupt company based on the S-Score Springate model is:

- a. $S > 0.862$ = The company is predicted to be healthy and not potentially bankrupt.
- b. $S < 0.862$ = The company is predicted in the category of financial distress and potentially bankrupt.

III. RESEARCH METHODS

This research is a type of descriptive research that aims to describe data about a phenomenon in a structured manner. Whereas the type of data is quantitative descriptive which describes the data in the form of numbers or symbols using a mathematical model. The type of data in this study is time series data that is data collected, recorded or observed time to time in sequence to describe a condition or event. While the data source used in this study is secondary data. Secondary data sources were obtained from PT Garuda Indonesia Tbk's financial statements from 2015-2019 in the Indonesia Stock Exchange. The analysis used is the Altman Z-Score and Springate method to predict the company's financial condition.

IV. RESULTS AND DISCUSSION

This section will explain the results of PT Garuda Indonesia Tbk's bankruptcy prediction calculations using the Altman Z-Score and Springate methods.

Table 2. The calculation results of the Z-Score method of PT Garuda Indonesia Tbk

Year	X	X	X	X	X	Z	Category
2015	28,7	0,	3,	51,3	115,3	1,99	Grey Area
2016	27,0	0,	0,	44,4	103,4	1,75	Grey Area
2017	24,9	0,	-4,2	42,9	111,0	1,75	Grey Area
2018	20,8	0,	0,	35,0	100,0	1,56	Grey Area
2019	20,6	0,	2,	34,6	80,2	1,38	Grey Area

Source: IDX, data processed, 2020

By using the Altman Z-Score method it can be seen that the financial condition of PT Garuda Indonesia Tbk from 2015-2019 is included in the category of gray area (gray area). Where can not be ascertained whether the company is potentially healthy or bankrupt. PT Garuda Indonesia Tbk for 5 consecutive years the average value of Z is 1.686 between Z 1.88-

2.99 so it is categorized as being in the gray area.

Table 3. The calculation results of the S-Score method of PT Garuda Indonesia Tbk

Year	A	B	C	D	S	Category
2015	0,287	0,032	0,0012	1,153	1,473	Not Bankrupt
2016	0,270	0,005	0,0008	1,034	1,310	Not Bankrupt
2017	0,249	-0,042	0,0017	1,110	1,319	Not Bankrupt
2018	0,208	0,004	0,0017	1,000	1,215	Not Bankrupt
2019	0,206	0,028	0,0001	0,802	1,036	Not Bankrupt

Source: IDX, data processed, 2020

Meanwhile, using the Springate method, it is known that the financial condition of PT Garuda Indonesia Tbk from 2015-2019 falls into the category of not going bankrupt. The results of calculations using the Springate method state that PT Garuda Indonesia Tbk is in good health. The average value is $1.277 > 0.862$.

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the above calculation results using 2 methods, namely Altman Z-Score with Springate obtained different results. The Altman Z-Score method for 5 consecutive years from 2015-2019 states that PT Garuda Indonesia Tbk is in the gray area category. Whereas using the Springate method for 5 consecutive years from 2015-2019 stated PT Garuda Indonesia Tbk in the category of not bankrupt or healthy.

VI. Recommendations

Recommendations that researchers can convey is that the measurement of bankruptcy predictions that have been made in this study can be a concern for PT Garuda Indonesia Tbk. Because with the bankruptcy prediction can be more careful in making decisions, especially related to corporate finances such as minimizing costs so as to increase company revenue and anticipate the occurrence of company failure.

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