

## **BANKRUPTCY ANALYSIS OF BANKING COMPANIES IN INDONESIA PERIOD 2001-2012 (Using the Altman Z-Score Model)**

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### **ABSTRACT**

The purpose of this study is to provide empirical evidence about the bankruptcy prediction model used by Altman. Research questions constructed in this study are whether the Altman Z-Score model built in 1968 can be used and relied upon in accommodating economic climate in Indonesia, especially as a predictor of bankruptcy in Indonesia banking company. Statistical test results showed that the Altman Z-Score model was appropriate for use in predicting the potential bankruptcy of the Indonesia banking company on the observation period 2001-2012. By doing so, this study concludes that the Altman Z-Score model can be a tool for predicting bankruptcy in Indonesia.

*Keywords:* Altman Z-Score, Bankruptcy, Indonesia Banking Corporation.

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### **1. INTRODUCTION**

Banking industry during the last period has experienced a rapid development. Bank is considered as the driving wheels of the economy of a country. This is because the function of banks as financial institutions is very important, for example in circulation of money to support business activities, a place to save money, to make a payment or billing, finance, and many other financial services. To maintain a financial system, a bank must be able to compete with competitor banks and other financial service providers, which also provide financial services. A bank is said to have won the business competition if it is able to provide better financial services than its competitors and is able to adapt to any changes in the environment. To anticipate the emergence of financial difficulties at the bank, there is a need to have a system that can provide early warning to the financial problems that threaten the survival of the bank's operations. With the early detection of banking conditions, it is possible for the banks to do the anticipatory measures to prevent the financial crisis; it can be promptly handled.

The climate and economic conditions in Indonesia has its own peculiarities, so the use of bankruptcy prediction model needs to be tested first whether it reliably accommodates the economic climate in Indonesia or not.

### **2. LITERATURE REVIEW**

Discriminant analysis is useful for companies to gain early warning of bankruptcy and the business continuity. The earlier a company acquires bankruptcy warning, the better the management is because the management can make repairs and can provide an overview and solid expectations of the future value of the company. Bankruptcy is usually interpreted as a failure of the company to run the company's operations in generating profits. Umaris (2005:23) said that bankruptcy could be defined as a failure in some sense namely:

- 1) Economic Failure (economic distress). Economic failure means that the company loses its money or its income and does not cover the cost itself. Failure occurs when the actual cash flow of the company fell below the expected cash flows. Failure can also mean that the level of investment income on the historical cost is less than the cost of capital.

2) Financial Failure (financial distress). The financial failure could be interpreted as the insolvency that distinguishes between cash flow basis, which has two forms; insolvency in the technical sense (technical insolvency) and insolvency in the bankruptcy sense.

In a technical sense, the company can be considered a failure if it can not meet its obligation in maturity although total assets exceed total debt, or a company fails to comply with one or more conditions in the provision of debt as the ratio of current assets to current liabilities ratio set or wealth net assets to the required total assets. Whereas in terms of bankruptcy, a failure is measured from negative net worth in the conventional balance sheet or present value of cash flow which is expected smaller than the liabilities. Bankruptcy is also often called as liquidation or closure of the company or companies' insolvability.

Liquidation has three meanings namely the realization of cash, termination of business by way of conversion of assets into cash, and distributing the results of the conversion. The latter sense is a way of healing available to borrowers, which could not pay its obligations (insolvent).

Based on the above theories, it can be concluded that the bankruptcy is a situation in which companies can no longer afford or fail to meet its obligations to creditors because the company does not already have or lack the funds to keep the company's operations running, so the goal of the company's economic to gain profit is not achieved.

Z-Score is a score that is determined from the standard counttimefinancial ratio indicating the chances of a magnitude level of corporate bankruptcy. Z-Score formula for predicting the bankruptcy of Altman is a multivariate formula that is used to measure the financial health of a company. Altman found five types of financial ratios that can be combined to see the difference between a company that went bankrupt and not bankrupt.

Discriminant function Z found by Altman to banking companies that have gone public is determined by using the following formula (Munawir, 2002):

$$Z\text{-Score} = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$$

Where:

$X_1$  = Working Capital/Total Assets

$X_2$  = Retained Earning/Total Assets

$X_3$  = Earning before Interest and Taxes (EBIT) (earnings before deducting interest expense)/Total Assets

$X_4$  = Market Value of Equity (market price of stocks)/Total Liabilities

$X_5$  = Sales/Total Assets

With the following assessment criteria:

- a) Z-Score >2.99 is classified as a very healthy company, so it does not run into financial difficulties.
- b) 1.81 < Z-Score < 2.99 is in the gray area so that it is classified as a company having financial difficulties, but the bankrupt chances and bankrupt opportunities are the same. It depends on the discretion of the management company's decision as a decision maker.
- c) Z-Score <1.81 is classified as companies that have enormous financial difficulties and are at high risk, so that they have the greater chances of bankruptcy.

These five ratios will be used to analyze a company's financial reports to then detect the chances of bankruptcy of the company. In financial management, the ratios used in Altman's method can be categorized into three major groups namely: Liquidity Ratio consisting of  $X_1$ , Profitability Ratio consisting of  $X_2$  and  $X_3$ , Activity ratio consisting of  $X_4$  and  $X_5$

The descriptions of each of these variables are as follows:

- a. Working capital to total assets is used to measure the liquidity of company assets relative to its total capital or to measure the company's ability to meet short-term obligations. Indicators that can be used to detect problems at the level of corporate liquidity are internal indicators such as insufficient cash, trade debt that swells, and several other indicators.
- b. Retained earnings to total assets are used to measure the cumulative profitability. This ratio measures the company's accumulated profits during operation. The firm age affects this ratio because the longer it operates, the more possibility it facilitates the accumulation of retained

earnings. Doing so may cause the company that is generally still relatively young show the results of a low ratio except that with very large profits at the beginning of its establishment.

- c. The earnings before interest and tax to total assets is used to measure the actual productivity of the company assets. The ratio measures the company's ability to generate earnings from used assets. This ratio is the largest contributor of the model. Some of the indicators that can be used in detecting a problem with the ability of the company's profitability include the increase of receivable accounts, a continuous loss in some quarters, the increase in inventory, the down sales, and the delay in the result of debt collection.
- d. The market value equity to book value of total debt is used to measure how many assets of a company can go down in value before the amount of debt is greater than its assets, and the company becomes insolvent. The capital in question is the combined market value of the common stock and preferred stock while the debt includes current liabilities and a longterm debt.
- e. The sales to total assets are used to measure the ability of management in facing the competitive conditions. The ratio measures the ability of management to make use of assets to generate sales.

The research that has been done before is by Kamal (2012) who analyzed the accuracy of Altman Z-Score model in predicting bankruptcy in Banks. Variables used by model of Altman Z -Score for companies that have not gone public are the ratio of working capital/total assets ( $X_1$ ), retained earnings/total assets ( $X_2$ ), EBIT (Earning Before Interest & Tax)/total assets ( $X_3$ ), stock book value of debt ( $X_4$ ), and sales/total assets ( $X_5$ ). With the formula of  $Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$  the result shows that the Altman Z-Score model is less appropriate to be used for predicting bankruptcy in bank.

Purwanti (2005) analyzed the bankruptcy prediction in go public banks in Indonesian Stock Exchange by using the Altman Z-Score model. Variables used are model of Altman Z-Score, the ratio of working capital / total assets ( $X_1$ ), retained earnings/total assets ( $X_2$ ), EBIT (Earning Before Interest & Tax)/total assets ( $X_3$ ), the stock market value/book value of debt ( $X_4$ ), and sales/total assets ( $X_5$ ). With the formula of  $Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$  Kamal research found that the Altman Z-Score model can predict bankruptcy of banks listed on the Indonesian Stock Exchange.

The mixed results encourage research on this issue, and the hypothesis constructed is:

**H1:** Altman Z-score model can be used as a predictor of bankruptcy on corporate banking in Indonesia.

### 3. RESEARCH METHOD

The sample of this research is banking companies listed in Indonesia Stock Exchange which ceased operations between the periods 2001 to 2012. The data used are financial report data available on the Indonesian Capital Market Directory (ICMD) of at least three consecutive years before the bank stops operating. Additional data obtained from various sources; books, journals, magazines, and other related resources.

The data processing in this study will be conducted with the help of Excel and SPSS program. The analysis used to describe the state of each company group, loss or no loss, is done through the calculation using Altman formula. The model analysis is as follows:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

$$Z = 1.2 X_1 X_2 + 1.4 + 3.3 + 1.0 X_3 + 0.6 X_4 X_5$$

### 4. RESULTS AND DISCUSSION

#### 4.1. Descriptive Statistics

The sample used in this study consists of 4 banking companies, which ceased operations period 2001-2012. An overview of the financial ratios of each bank can be seen in Table 1.

Tabell:Descriptive Statistical Test

|                    | N | Minimum | Maximum | Mean   | Std. Deviation |
|--------------------|---|---------|---------|--------|----------------|
| Z <sub>3</sub>     | 4 | -.099   | .415    | .23600 | .228680        |
| Z <sub>2</sub>     | 4 | -.031   | .413    | .22650 | .190628        |
| Z <sub>1</sub>     | 4 | .014    | .387    | .20475 | .194969        |
| Valid N (listwise) | 4 |         |         |        |                |

From the table above it can be seen that the value of the average Z-Score in the third year before the bank stopped operating was at 0.236. The smallest Z-Score value in the third before stopping operation was achieved by Lippo Bank amounting to -0.099. Z-Score greatest value in the third year before stopping operation was achieved by DanpacBank of 0.415.

The average value of Z-score in the second year before the bank stopped operating was at 0.22650. Z-Score smallest value in the second year before it stopped operating again was achieved by Lippo Bank of -0.031. Z-Score greatest value in the second year before it stopped operating again was achieved by DanpacBank amounted to 0.413. The average value of Z-Score banking in the first year before it stops operating is at 0.20475. The smallest Z-Score value in the first year before it ceased operations was achieved by PikkoBank of 0.014. Z-Score greatest value in the first year before it stopped operating again was achieved by the DanpacBank amounted to 0.387.

This suggests that the LippoBank during the second and the third year before stopping operation has the lowest value of Z-Score while in the first year before it ceased operations; the lowest value of the Z-Score is obtained by Pikko Bank. In addition, for three consecutive years before it ceased operations, DanpacBank has the highest Z-Score value.

#### 4.2. Normality Test

Normality test aims to test whether or not the research model variables are normally distributed. Good regression model is a regression models that has normal or near normal distribution of residual value. Normality test data in this study uses One-Sample Kolmogorov Smirnov test. The criteria used to compare the probability value obtained with the guidelines of decision-making are as follows:

- If the probability value  $> 0.05$  then the data are normally distributed.
- If the probability value  $< 0.05$  then the data are not normally distributed.

From the test results with the Kolmogorov test it can be seen that the results of the Z-Score banking for three consecutive years before it ceased to operate has a normal distribution because the significant value is greater than the significance level of 0.05.

#### 4.3 Hypothesis Testing

The hypothesis testing using the Wilcoxon Signed Ranks Test is the Altman Z-Score method that is used precisely to predict the potential bankruptcy of the banking company in Indonesia. The analysis results can be seen in table 2 below.

Table 2: The Testing of Wilcoxon Signed Ranks Test

|                       | Sig. Z | Conclusions |
|-----------------------|--------|-------------|
| Z-SCORE (t-3) – (t-2) | 1,000  | Useable     |
| Z-SCORE (t-2) – (t-1) | 1,000  | Useable     |

The test is conducted with a significance level ( $\alpha$ ) of 0.05 or 95% level of confidence. Based on the analysis of table 2 it can be seen that the variable has a significance of Z-Score value is greater than the significance level ( $\alpha$ ) of 0.05, ie  $Z > 0.05$ , so the research hypothesis is accepted. This means that the Altman Z-Score can be used in assessing and predicting the potential bankruptcy of the banking company in Indonesia.

### 5. CONCLUSIONS

Based on the research results on the analysis of the bankruptcy in corporate banking in Indonesia during 2001-2012 using the Altman Z -Score models, it can be concluded from the hypothesis testing

that the Altman Z-Score models is appropriate for use in predicting the potential bankruptcy of the *go public* banking companies in Indonesia. This indicates that the model developed by Altman about Z-Score can accommodate climate and economic conditions in Indonesia as an early warning system of potential bankruptcy, so that corrective measures can be done to prevent it.

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