BANGKRUPTCY POTENTIAL USING THE LOGIT PANEL ANALYSYS AND THE ALTMAN Z-SCORE DISCRIMINATION METHOD (CASE STUDY OF BNI, BRI AND MANDIRI (PERSERO)TBK 2016-2018 PERIOD)

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Abstract
This research was conducted to determine the potential bangkruptcy of the three largest banks in Indonesia over the past three years, namely 2016 – 2018 with using two methods, namely the Zmijweski Panel Logit method and the Altman Z-Score method. This study uses secondary data in the form of data from financial statements which obtained from www.go.id and wwwBankindonesia.go.id. The results showed that the three red-listed banks (BRI, BNI and Mandiri Bank) in Indonesia showed the potential bangkruptcy. From the Zmijweski method it is seen that the average obtained by BRI with the most potential to go bankrupt, with an average value over a period of three years amounting to 0.405, after that Mandiri Bank with a value of 0.316, and then BNI with an average number over the past three years is 0.276. Whereas from the Altman Z-Score method wich has the highest bankruptcy potential is Mandiri Bank with an average value over the last three years is 0.4077, then BNI with an average value of 0.575, and BRI with an average value in the last three years is 0.807.

Keywords: Altman Z-Score, Zmijweski Panel Logit, Bangkruptcy Potential.

INTRODUCTION

The economics failure is showing that the company loses money or a condition of the company can not afford their needs or cover the costs of the company itself. This can be seen by analyzing the company's financial statements, where when analyzing it looks generally the company is not able to cover the cost of capital from the company's cash flow or the cost of capital of the company looks smaller than its obligations. That is because many companies start their business with debt, so that they are entwined with obligations that must be paid immediately so that bangkruptcy will clearly become the company's dilemma.

According to Martono (2008:51), Financial Statements is an overview of the company's financial situation at a particular time. By analyzing the financial statements can be seen the company's activities. With certain methods or techniques, it can be seen wheter the company's condition is in good /healthy or not / not healthy condition.

Change in economic conditions will automatically affect the company's financial performance. If management is unable to manage the company well, then the decline in financial performance and even the danger of bankruptcy of the company will most likely be faced by the company.

The beginning of a bangkruptcy is a condition of financial difficulties of the company condition (financial distress). Hanafi (2005:638) quoted by Pane (2015) the bangkruptcy is a condition that must be watched by every companies. Toto (2011:332) says bangkruptcy is a condition where

the company's cannot fulfill its obligations. Kahya and Theodossiou (1999), categorize financial distress condition based on debt default criteria, namely the occurrence of debt default by or debt default by renegotiating with creditors or other fianancial institutions, where information about debt default and debt default indications the default is taken from the Wall Street Journal Index (WSJI) information.

In the IMF Working Paper, Enoch, et al (2011) in Shidiq (2017), the development of banking in Indonesia started during the monetary crisis in 1997 -1999 into seven phases, namely (1) The government carried out major liberalization in the financial sector through the issuance of pact 88 which caused the number of banks to increase from 111 in 1988 banks to 240 in 1994; (2) October-November 1997, Indonesian banking faced a macroeconomics shock which was a source of liquidity problems, that caused Thailand's exchange rate (Baht) to be released to floating in July 1997; (3) In December 1997, the banking sector experienced a decline in the economic sector, caused the government lose control; (4) January-February 1998, the government re-established a new crisis in which 54 banks including 36.7% of deposits were under the control of BPPN; (5) Mach-May 1998 Bank Indonesia restructured BLBI and new BPPN management by intervening banks under its control, such as expropriation, management overhaul, and overhauling several banks; (6) June-September 1998 The monetary authorities re-designed a solution and comprehensive strategy, Bank Indonesia announced a joint recapitalization plan for private and regional banks with certain requirements; (7) October-December 1998, The banking policy was felt to be quite slow and uneven, so that it would cost a large restructuring.

LITERATURE REVIEW
According to Zmijweski (1984: 72) in Khairunnisa (2016) Bankguptcy probabilities are calculated using parameters estimated on the basis of the respective estimation techniques/ sample desain. From the above understanding it can be interpreted that the probability of bankruptcy can be measured by using parameters estimated in each tecnique/sample. The WESML technique is a logit regression which is usually used as the basis of the research sample. Logit regression is a statistical analysis method that describes the relationship between dependent variables that have two or more categories with one or two independent variables. If the correlation value of a bankrupt company is positive, this indicates a different above classification or higher; and companies that have not experienced bankruptcy are negative, which indicates deviations that are under classification or lower.

The formula for predicting bankruptcy of the logit panel model is as follows:

X= -4,3 -4,5 X1+ 5,7X2 + 0,004X3.

Meanwhile, according to Altman (1968:594) in Chairunnisa (2016) "The Final discriminant function is a follow" which means "the final discriminant functiont is a follow-up. This means that if a company has calculated its bankruptcy potential with a discriminant model and it has been known that the company has the potential to go bankrupt, then it must be followed up immediately so that it does not fail to be able to innovate business or be more disciplined in corporate finance. The Altman's model is useful as an early warning of bankruptcy and the

continuation of its business (Muharrami,(2018) cited in Aminah et, al;2015). The Altman's model has an accuracy of up to 95% and can use data 1 year before bankruptcy.

There are three Altman's fprmulas that can be used in calculating financial difficulties in a company, that is:

1. Public Company: $Z = 1,21X1 + 1.4x2 + 3.3x3 + 0.6x4 + 0.999x5$

2. Private Company: $Z = 0.717x1 + 0.847x2 + 3.107x3 + 0.420x4 + 0.998x5$

3. Service Company: $Z = 6.56x1 + 3.26x2 + 6.72x3 + 1.05x4$

The emergence of various bankruptcy prediction models is an anticipation and early warning system for the possibility of bankruptcy whose purpose is a means to identify and even improve conditions before they reach a critical condition or bankruptcy.

Therefore this study examines the potential for bankruptcy that may occur in the Indonesian banking world by using Zmijweski method which explains the WESML (Weighted Exegeneous Sample Maximum Likelihood) technique or commonly known as the Logit Panel and the Altman Z-Score discriminant method and which can be used to predict financial distress banking in 2016-2018.

METHODOLOGY
This study examines three red-line banks in Indonesia, namely Bank Negara Indonesia (Persero) Tbk, Bank Rakyat Indonesia (Persero) Tbk, and Bank Mandiri (Persero) Tbk conducted for 3 years (2016-2018) and using two estimation methods, namely the Zmijweski method with the WESML Panel Logit and Altman Z-Score technique. With these two methods the researcher aims to identify the potential for bankruptcy (financial distress) in the National Banking.

This study will reveal the financial condition of the largest commercial banks in Indonesia by describing the object of research based on facts sourced from www.idx.go.id and www.BankIndonesia.go.id which will appear through the data processing with two different methods.

Bangkruptcy Prediction Zmijweski Panel Logit Method:

The Formula: **X= -4, 3 -4, 5 X1+ 5,7X2 + 0,004X3**

Description: X-Score is < 0 or negative (-) : Healthy

X-Score is > 0 atau positive (+) : Potential For Bankruptcy

X Value is X value - Zmijweski score (Logit Panel) which shows bankruptcy. X1 = ROA (Earning After Tax / Total asset)

X1 used to measure the level of the company's net profit against all ssets owned by the company.

X2 = Leverage (Total Debts / Total assets)

X2 shows the company's leverage or is used to measure the total asets of the company in paying off all obligations.

X3 = Liquidity (Current assets / current debt)

X3 showed how the current assets in the company are used to pay off the company's short-term liabilities to avoid bankruptcy.

Altman Z-Score Bangkruptcy Prediction Model

The Formula : Z = 1,21X1 + 1.4x2 + 3.3x3 + 0.6x4 + 0.999x5.

The Altman Z-score model classified companies by scores, which are:

Banking Score	POTENTION
Z score < 1.81	Potential for Bankruptcy
1.81>Z score <2.67	*Grey Area*
Z score > 2.67	Not potentially bankrupt (Healthy)

The   Z value is Altman's Overall Index or Z-sore value which indicates bankruptcy.

X1 = (Current assets – Current Debt)/Total Assets

The difference between current assets and current debt/liabilities is called working capital in a company. Working capital to total asset is used to measure the liquidity of a company's assets relative to its total ssets or to measure the company's ability to meet short- terms obligations in terms of working capital.

X2 = Retained Earnings / Total Assets

Retained earnings against to total assets is used to measured cumulative profitability. This ratio measured the accumulate company's profitability while the company is operating. Retained earning that are used in this case are current year profits.

X3 = Earning before interest and taxes/total assets

Earning before interest and taxes (EBIT) on total assets is used to measured the actual productivity of the company's asets. Or it can be said how total assets generate gross profit.

X4 = Markett value of equity / Total Debt

The Market value of equity of the total amount of debt is used to measured how much the company's assets can go down in value before the amount of debt is greater than its assets and

the company went bankrupt. A large amount of debt will be dangerous for the company, especially if there is interest to be paid.

X5 = Sales / Total Asset

This X5 measuring instrument is commonly called an asset turnover which is used to measure the level of efficiency of the company in utilizing the assets owned by the company. This ratio is a measure of the effectiveness of using total assets.

RESULT AND DISCUSSION

Based on data obtained from the published Financial Statements of BNI, BRI and Mandiri which are processed according to the Zmijweski Panel Logit method, and using the last three years (2016, 2017, and 2018) can be seen in the following table:

Zmijweski Panel Logit Method

VARIABELS	BRI			BNI			MANDIRI		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
X1	0.038	0.037	0.037	0.027	0.027	0.028	0.020	0.027	0.032
X2	0.854	0.851	0.857	0.817	0.823	0.830	0.794	0.849	0.846
X3	1.138	1.136	1.176	1.310	1.314	1.298	1.273	1.175	1.173

Source: Data Processed from www.idx.go.id and www.BankIndonesia.go.id

From the above data, then entered into the Logit Panel Zmijweski Method formula, which is X = -4.3 -4.5 X1 + 5.7X2 + 0.004X3, the following results are obtained:

YEARS	BRI	BNI	MANDIRI
2016	0.398	0.241	0.142
2017	0.392	0.277	0.421
2018	0.425	0.311	0.385
AVERAGE	0.405	0.276	0.316

Source: Data Processed

According to the Zmijweski Logit Panel theory, a company with a number > 0 or positive value can be categorized that the company has the potential to go bankrupt. Based on the results of data processing using the Zmijweski Panel Logit Method at BRI Bank for an average of the last three years a score of X = 0.405 is greater than 0 or positive (0.405> 0 / (+)), which means that Bank

BRI has the potential to go bankrupt. For BRI banks, this potential shows fluctuating scores during the period of 2016 to 2018. Bank BNI has a smaller potential than BRI, where the results show an average of three years obtained a score of 0.276. The figure also shows the potential for bankruptcy, where the score is still positive and greater than 0 (zero), but the figure is still better than BRI's bank. While the trend shows the last three years the potential for bankruptcy is increasing, where in 2016 X = 0.241, 2017 has not shown improvement because the value of X has increased by 0.277, and in 2018 continues to increase. The same thing happened with the condition of Bank Mandiri, which showed an average score of the last three years of only 0.316, which means the potential for bankruptcy is also the same as that of Bank BNI and BRI. In 2016 Bank Mandiri value X = 0.142, then the potential for bankruptcy increased dramatically to 0.421, and fortunately in 2018 it fell to 0.385.

This happened because the three leading banks in Indonesia showed that their ability to generate profits from their assets was still very low. While the ratio of total debt to total assets owned is so high that the three banks with red templates in Indonesia tend to go bankrupt.

Altman Z-Score Bankruptcy Prediction Model
By using the Altman Z-Score bankruptcy prediction model, data obtained are processed in accordance with the Altman Z-Score method from the published financial statements of BRI, BNI and Mandiri banks for the past three years as follows:

VARIABEL	BRI			BNI			MANDIRI		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
X1	0.117	0.114	0.146	0.228	0.231	0.222	0.203	0.143	0.142
X2	0.026	0.026	0.022	0.019	0.019	0.019	0.014	0.019	0.022
X3	0.034	0.033	0.032	0.024	0.024	0.024	0.018	0.024	0.028
X4	0.171	0.175	1.667	0.181	0.173	0.164	0.186	0.178	0.182
X5	0.114	0.112	0.108	0.098	0.093	0.089	0.071	0.068	0.071

Source: Data Processed from www.idx.go.id and www.BankIndonesia.go.id

Then entered into the Altman Method with the discriminant model used for public companies, namely $Z = 1.21X1 + 1.4x2 + 3.3x3 + 0.6x4 + 0.999x5$, the data obtained as below:

YEARS	BRI	BNI	MANDIRI
2016	0.504	0.585	0.505
2017	0.497	0.581	0.453
2018	1.420	0.559	0.473
AVERAGE	**0.807**	**0.575**	**0.477**

Source: Data Processed

Based on the Altman Z-Score calculation, it can be seen that the average for three years shows the potential for bankruptcy. At BRI banks, the average Z-Score shows the number 0.807 (Z score <1.81), which indicates that during the last three years BRI has the potential to go bankrupt. It was illustrated that in 2016 the Z-score was 0.504, then in 2017 it dropped to the level of 0.497, which indicates the potential for bankruptcy is getting bigger, but in 2018 the overall index value in BRI has increased dramatically to 1,420 close to the score of 1.81 but cannot be included the "gray area" category. The conditions that occur between BNI and Mandiri banks are not much different. The average Z score indicates a lower number than BRI, 0.575.

This is illustrated in the table that illustrates that in 2016 Z scores on BNI amounted to 0.585, which means the potential for bankruptcy, in 2017 amounted to 0.581, then in 2018 z BNI scores increasingly decreased namely 0.559 which indicates BNI's potential for bankruptcy is clearer. At Bank Mandiri, the potential for bankruptcy (Overall Index) experienced a significant decline, the average z-score was 0.477 million lower than BNI and BRI. In 2016 the Z score is 0.505, in 2017 it will drop to 0.453, and in 2018 there will be 0.473. This indicates that Bank Mandiri has greater bankruptcy potential.

CONCLUSION
Based on the results of calculations and data processing conducted on the financial statements of banks using two methods that can be used to measure the potential bankruptcy of the company, namely the Zmijweski Panel Logit method and the discriminant method Altman Z-score of the three red-template banks in Indonesia have the potential to experience bankruptcy. From the Zmijweski method it is seen that the average obtained by BRI with the most potential to go bankrupt, with an average value over a period of three years amounting to 0.405, after that Bank Mandiri with a value of 0.316 and then BNI with an average number over the past three years

0.276. This is because the amount of debt owned by the three banks with the red template.

When viewed from the discriminant method Altman Z-score of a bank that is potentially bankrupt is Bank Mandiri with an average value over the past three years namely 0.477, then BNI with an average value of 0.575, most recently BRI with an average number for the past three years of 0.807.

SUGGESTION

Based on the results of research conducted at three leading banks in Indonesia, namely BRI, BNI and Bank Mandiri over the past three years, the following suggestions can be given:

1. For the three banks it is recommended to anticipate the potential for bankruptcy, and if the bank has known the potential for bankruptcy then its performance must be immediately.

2. For all three banks, you should increase bank profits and reduce debt.

3. For Bank BNI, BRI, and Mandiri to maintain the company's liquidity, the liquidity ratio should be increased at least above 1%.

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