:: IJEBD ::
(International Journal of Entrepreneurship and Business Development)
Volume 07 Number 03 May 2024

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Financial Distress Analysis to Predict the Bankruptcy Rate of State-Owned Banks Using the Altman Z–Score Method (Case Study on Commercial Banks of Persero Listed on the Indonesia Stock Exchange for the 2019 – 2021 Period)

Bambang Widjanarko
Narotama University, Surabaya, Indonesia
Corresponding Author*: bambangkoko@gmail.com

ABSTRACT

Purpose: Bankruptcy is the inability of a company to continue its operations due to a decline in its financial condition and has liabilities or debts that are greater than the value of its assets. This study aims to predict the level of bankruptcy of state-owned banks using the Altman Z – Score method.

Design/methodology/approach: This study uses a quantitative research approach with the Z – Score method. The data used is secondary data in the form of state-owned commercial bank financial reports for the period 2019 – 2021 which are listed on the Indonesia Stock Exchange (IDX), taken from the official website at www.idx.co.id. The variables used consist of 4 independent variables and 1 dependent variable, namely Working Capital to Total Assets (X1), Retained Earnings to Total Assets (X2), Earnings Before Interest and Taxes to Total Assets (X3) and Book Value of Equity to Book Values of Debt (X4) and analysis index Z – Score (Z).

Findings: The results of the Z – Score calculation, the four banks in this study are in the Gray Area and Distress Area categories because working capital, retained earnings and operating profits are smaller than their total assets, and the amount of debt is greater than their total equity. The chance of bankruptcy will be even greater if the company's management does not immediately make improvements or evaluate the company's financial condition.

Paper type: Research paper

Keyword: *Bankruptcy, Method – Z Score, Government Bank (BUMN)*

Received : January 10th
Revised : April 18th
Published : May 31th

I. INTRODUCTION

Banking plays an important role in people's lives. Banking activities are so influenced by customer trust or the wider community. Banks are considered the driving force of a country's economy. Four banks with government-owned status received the title of market leader from 118 banks in Indonesia, namely Bank BRI, Mandiri, BNI and BTN. Because of its position as a market leader with a large market share, the performance of state-owned banks greatly affects the performance of national banks. If the performance of state-owned banks is good, the overall banking industry performance will also be good (Emilia, 2018).

As an effort to anticipate bankruptcy, one of the tools used by companies to assess the company's condition is the financial statements produced every period. In order for the company to know more clearly the current condition of the company, the company can compare the current financial statements with the previous period's financial statements. One analysis method that has proven to provide many benefits is the Z-Score model. This model was developed by Edward I Altman, a financial economist. This model is a development of the statistical technique of multiple discriminants that combine the effects of several variables. Altman's model is a financial analysis model that has been widely used in the United States (Sarwani & Sunardi, 2019).

Based on the phenomenon in the background above, problems can be formulated, namely: Can the Altman Z – Score method be used to assess the bankruptcy rate of commercial banks for the 2019-2021 period.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Based on the background above, the title of this study is "Financial Distress Analysis to Predict the Bankruptcy Rate of State-Owned Banks Using the Altman Z – Score Method (Case Study of a Company Commercial Bank Listed on the IDX for the 2019 – 2021 Period).

A. Problem Statement

Based on the background of the above problems, the problems that will be discussed and sought answers in this study are: "How is the potential for bankruptcy in Government Banks (SOEs) listed on the Indonesia Stock Exchange from 2019-2021 based on the Z – Score analysis method?".

B. Literature Review

1. Bankruptcy

Bankruptcy according to Supriadi (2020:232) is the inability of a company to continue its operations because its financial condition has decreased and has liabilities or debts that are greater than the value of its assets. Bankruptcy is usually interpreted in layman terms as the company's failure to carry out the company's operations to generate profits. Bankruptcy analysis is very important to be analyzed early to obtain early signs of bankruptcy so that in this case it can minimize the risk of bankruptcy.

According to Altman (2019), bankruptcy is a failure that occurs in a company. Some of the reasons companies can fail include:

a. Poor operating performance and high levels of leverage
b. Lack of technological innovation
c. High rate of new business formation
d. Major industrial deregulation
e. Unexpected liabilities

2. Altman-Score Ratios

The ratios in the Altman Z – Score method each describe their own company. The Altman Z-Score model is a multivariable equation analysis method used to predict the bankruptcy rate of a company. The financial variables used in the analysis of the Altman model are as follows:

1. X1 = Net Working Capital to Total Assets
   This ratio shows the company's ability to generate net working capital from all its total assets.
2. X2 = Retained Earnings to Total Assets
   This ratio shows the company's ability to generate retained earnings from its total assets. Retained earnings usually occur because shareholders allow the company to make further investments in profits that are not distributed as dividends, as reserve capital / business development or to pay company debts.
3. X3 = Earnings Before Interest and Taxes to
   Tottal Asset)
   This ratio shows the company's ability to generate profits from company assets before tax or interest.
4. X4 = Book Value of Equity to Book Value of Debt)
   This ratio shows the company's ability to measure the company's ability to manage all of the company's capital against its debts.
5. Z = Z – Score

From the financial statement data then analyzed using financial ratios that have been substituted into the modified Z - Score formula with the following formula:

$$Z = 6.56\ X1 + 3.26\ X2 + 6.72\ X3 + 1.05\ X4$$

Provided:

A Z < of 1.1 indicates the company is in a state of bankruptcy
1.1 < Z < 2.6 indicates the company is within the Grey Area
Z > 2.6 indicates the company is in a Save zone condition

3. Financial Distress

Financial distress can mean everything from liquidation difficulties which are the mildest financial difficulties, all the way to bankruptcy declarations, which are the most severe financial difficulties.

According to Simanjuntak et al. (2017), financial ratios simultaneously have a significant effect on financial distress. In this case, financial distress can be measured using financial ratios. Financial distress can be caused by several factors such as:

a. Revenues that have decreased significantly.
b. Decrease in net income and cash flow from operations.
c. The stock market price declined significantly.
d. Decrease in total assets.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

e. The possibility of failure in an industry with high risk.
f. Young companies generally experience difficulties in the early years of operation, then if not supported by strong sources of capital will end in bankruptcy.
g. Significant deductions in dividends

Platt & Platt (2002) deep Gobenvy (2013) Stating there are several ways to test that a company is experiencing financial distress, such as:

1. There is a termination of labor or non-payment of dividends.
2. Interest Coverage Ratio.
3. Smaller cash flow than current long-term debt.
4. Net operating income was negative.
5. There is a change in the price of equity.
6. The company ceased operations at the authority of the government and the company was required to carry out restructuring planning.
7. The company suffered a technical breach in debt and it is predicted that the company will go bankrupt in the coming period.
8. Have a negative Earning Per Share (EPS).

C. Thinking Framework

The conceptual framework of this research is as follows:

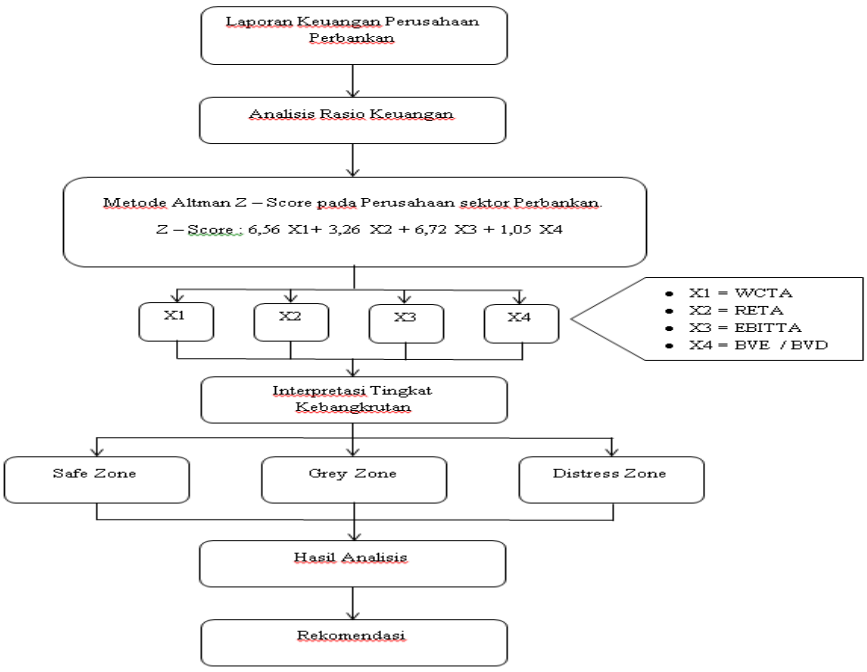

Figure 1 Thinking Framework Image

II. METHODS

A. Research Approach

This study aims to predict the bankruptcy rate of the persero bank using the Altman Z – Score method. This study used a quantitative research approach with the Z – Score method.

Quantitative research is the activity of collecting data, processing analysis, and presenting data based on the amount carried out objectively to solve a problem or test a hypothesis to develop general principles (Duli, 2019).

Quantitative methods can be interpreted as research methods based on the philosophy of positivism, used to examine certain populations or samples, data collection using research instruments, quantitative or statistical data analysis, with the aim of describing and testing hypotheses that have been established (Sugiyono, 2018:15).

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

So, the research conducted in this study uses quantitative methods because the data needed from the objects in this study are data expressed in the form of numbers, and are the results of calculations and measurements of the value of each variable.

B. Research Object

The object of research is an attribute or trait or value of people, objects, organizations or activities that have certain variations determined by researchers to be studied and then drawn conclusions (Sugiyono, 2018:57).

The object of research in this study is a persero bank with a unit of analysis of financial ratios from the financial statements of related companies.

C. Population and Sample

1. Population

A population is a group of people (or institutions, events, or other subjects of study) that want to be described or that want to be generalized (Vogt & Johnson, 2015). While Population according to Sugiyono (2018:130) is a generalization area consisting of objects or subjects that have certain quantities and characteristics that are determined by researchers to be studied and then drawn conclusions.

Based on the population definition above, the population in this study is all 4 commercial banks consisting of Bank BRI, Bank BNI, Bank BTN and Bank Mandiri and have been registered on the IDX for the 2019-2021 period.

2. Sample

The research sample is part of the number and characteristics possessed by that population. When a population is large, researchers may not take all of it for research, then researchers can use samples taken from that population. Thus, it can be concluded that the sample is part of the number and characteristics of the population studied (Sugiyono, 2018).

According to Sugiyono (2018) Sampling technique is a technique used in sampling. There are various sampling techniques used in determining research samples. The sampling technique used in this study is using the non-probability sampling method.

According to Sugiyono (2018), Non probability sampling is a sampling technique that does not provide equal opportunities for every element or member of the population to be selected as a sample. The non-probability sampling technique used in this study is using a saturated sampling technique, which is sampling if all members of the population are used as samples.

Based on the explanation above, the sample of this study will be 100% of the existing population, namely all commercial banks consisting of 4 banks, namely Bank BRI, Bank BNI, Bank BTN and Bank Mandiri within 3 years.

D. Types, Sources and Techniques of Data Collection

1. Data Types and Sources

Data plays an important role in research, especially quantitative research. Data is a collection of useful information obtained from the field or directly used for research materials (I Made, 2020).

The type and source of data used in this study is secondary data taken from the official website of the Indonesia Stock Exchange, namely in www.idx.co.id.

2. Data Collection Techniques

Data collection technique is a process or procurement for research purposes where the data collected is to test hypotheses that have been formulated (Rukajat, 2018:6).

Data is obtained from literature studies and financial statements published and audited during the period 2019 – 2021 by related banking companies. The method used to get the desired data is to open the official website of the object under study so that it will get data and a general description of the company and the development of the company.

E. Data Analysis Techniques

1. Analisis Altman Z – Score

The data analysis technique in this study uses the Altman Z method – Score modification. Z – Score is one of the time-tested multivariate models. This model was developed by Edward I Altman (1968), a financial economist. Z-Score is a multivariable equation used by Altman to predict bankruptcy rates (Prihadi, 2019:468).

Altman found several adjustments of the Z–Score model to different types of companies so that this method could be applied to all companies. In the modified Z – Score model there are 4 variables, each of which represents

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

a financial ratio. These variables are combined to see the company's bankruptcy rate. Here is the formula used for Altman Z – Score modification:

Z = 6.56 X1 +3.26 X2 + 6.72 X3 + 1.05 X4

The "*cut off*" values for this index are:

Z < 1.1 : Bangkrut
1.1 < Z < 2.6 : Grey Area
Z > 2.6 : Save Zone

Information:
X1 = Working Capital To Total Asset
X2 = Retained Earning To Total Asset
X3 = EBIT To Total Asset
X4 = Total Equity to Total Debt Ratio
Z = Overall Index

In the Altman Z – Score model, variable modification X5 is not used. Because, non-manufacturing companies generally offer services instead of selling goods. The value of X5 describes asset turnover whose philosophy is to understand how efficiently the asset is able to generate income. In service companies, fixed assets are usually not directly related to income.

III. RESULTS AND DISCUSSION

A. Description of Research Results Data

In this study the data used consisted of 4 independent variables and 1 dependent variable, namely Working Capital to Total Asset (X1), Retained Earning to Total Asset (X2), Earning Before Interest And Taxes to Total Asset (X_3) and Book Value of Equity to Book Values of Debt (X4) and Z – Score (Z) analysis index.

The data used in this study is secondary data in the form of financial statements of commercial banks starting from the period 2019 – 2021 taken from the official website of the Indonesia Stock Exchange (IDX) in www.idx.co.id.

1. Altman Z Variable Calculation – Score

a. Working Capital to Total Asset (X1)

This ratio shows the company's ability to generate net working capital from all its total assets. The calculation of this ratio is by dividing the net working capital by the total assets or total assets owned by the company. Meanwhile, net working capital itself is calculated from the results of reducing current assets with current debt. If the net working capital is negative, the company will most likely face problems paying off its debt. Conversely, if net working capital is positive, the company rarely faces difficulties in paying off debt.

Table 1 Calculation of Net Working Capital for 2019 – 2021 (in millions of rupiah)

Bank Name	*Year*	*Current Assets (Rp)*	*Current Debt (Rp)*	*Net Working Capital (Current Assets – Current Debt)(Rp)*
BRI	*2019*	*1.365.501.785*	*1.206.509.138*	*158.992.647*
	2020	*1.533.960.257*	*1.379.133.070*	*154.827.187*
	2021	*1.598.104.881*	*1.385.809.555*	*212.295.326*
BNI	*2019*	*805.407.068*	*660.280.743*	*145.126.325*
	2020	*844.604.295*	*731.265.926*	*113.338.369*
	2021	*910.357.028*	*787.136.412*	*123.220.616*

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

BTN	*2019*	*301.771.108*	*281.940.964*	*19.830.144*
	2020	*346.109.477*	*331.026.129*	*15.083.348*
	2021	*355.222.815*	*341.701.920*	*13.520.895*
Mandiri	*2019*	*1.245.828.742*	*1.191.727.756*	*54.100.986*
	2020	*1.457.965.035*	*1.336.613.933*	*121.351.102*
	2021	*1.637.152.320*	*1.502.862.703*	*134.289.617*

Sumber : www.idx.co.id, diolah

Table 2 Total Assets of Commercial Bank Persero (in millions of rupiah)

Bank Name	*Year*	*Total Asset*
BRI	*2019*	*1.416.758.840*
	2020	*1.610.065.344*
	2021	*1.678.097.734*
BNI	*2019*	*845.605.208*
	2020	*891.337.425*
	2021	*964.837.692*
BTN	*2019*	*311.776.828*
	2020	*361.208.406*
	2021	*371.868.311*
Mandiri	*2019*	*1.318.246.335*
	2020	*1.541.964.567*
	2021	*1.725.611.128*

Sumber : www.idx.co.id

Based on the table of working capital and total assets above, the variable value X1 (*Working Capital to Total Assets) can be calculated* which is presented in the following table:

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Table 1 X Ratio Calculation1 (Working Capital to Total Assets) Commercial Bank of the Company for the period 2019 – 2021. (in millions of rupiah)

Bank Name	*Year*	*Net Working Capital(Rp)*	*Total Asset (Rp)*	$X1 = \frac{Modal\ Kerja\ Bersih}{Total\ Asset}$ *(IDR)*
BRI	*2019*	*158.992.647*	*1.416.758.840*	*0,112*
	2020	*154.827.187*	*1.610.065.344*	*0,096*
	2021	*212.295.326*	*1.678.097.734*	*0,127*
BNI	*2019*	*145.126.325*	*845.605.208*	*0,172*
	2020	*113.338.369*	*891.337.425*	*0,127*
	2021	*123.220.616*	*964.837.692*	*0,128*
BTN	*2019*	*19.830.144*	*311.776.828*	*0,064*
	2020	*15.083.348*	*361.208.406*	*0,042*
	2021	*13.520.895*	*371.868.311*	*0,036*
Mandiri	*2019*	*54.100.986*	*1.318.246.335*	*0,041*
	2020	*121.351.102*	*1.541.964.567*	*0,079*
	2021	*134.289.617*	*1.725.611.128*	*0,078*

From the calculation of table 4.11 ratio X_1 (*Working Capital to Total Assets*) we can know the fluctuating value of *working capital to total assets* of commercial banks of the company each year:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.112; 0,096; 0,127.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.172; 0,127; 0,128.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.064; 0,042; 0,036.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.041; 0,079; 0,078

In addition, there was a decline in 2020 in working capital to total assets of the four banks. However, only BRI and BNI banks finally survived in 2021, while BTN and Mandiri banks had their working capital value declining.

From the calculation of *working capital to total assets*, it can be concluded that commercial banks (SOEs) are less relative to their total capitalization. This can be seen from the value of working capital to total assets of the four banks has not been able to generate working capital greater than Rp. 1.00 for every 1.00 assets or it can be said that every Rp. 1.00 total assets can only be guaranteed by net working capital equal to the value of each of these banks.

b. Retained Earnings to Total Asset (X_2)

This ratio is an indicator of cumulative profitability about the length of time an enterprise takes to build cumulative profit. In other words, the younger the company, the less time it has to build the company's profits and the more likely it is to experience business failure. If a company loses, then the total and value of retained earnings in the company will decrease. The following is a table of retained earnings owned by each commercial bank company.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

This ratio is calculated by dividing retained earnings by total assets owned. The following is the value of *retained earnings* presented in table 4.12

Table 2 Retained Earnings in 2019 – 2021 (in millions of rupiah)

No	Bank Name	Year		
		2019	2020	2021
1	BRI	181.327.431	166.972.167	185.009.048
2	BNI	82.463.505	66.980.701	78.250.204
3	BTN	13.361.997	8.763.294	11.139.521
4	Mandiri	138.986.941	119.556.775	142.587.934

Sumber : www.idx.co.id

Based on the table above, it can be calculated the variable value X2 (*Retained Earning to Total Assets*) which is presented in the following table:

Table 3 Calculation of the ratio X2 (retained earnings to total assets) of commercial banks for the period 2019 – 2021 (in millions of rupiah)

Bank Name	Year	Retained Earnings (IDR)	Total Assets (IDR)	$X2 = \frac{Laba\ Ditahan}{Total\ Assets}$ (IDR)
BRI	2019	181.327.431	1.416.758.840	0,128
	2020	166.972.167	1.610.065.344	0,104
	2021	185.009.048	1.678.097.734	0,110
BNI	2019	82.463.505	845.605.208	0,098
	2020	66.980.701	891.337.425	0,075
	2021	78.250.204	964.837.692	0,081
BTN	2019	13.361.997	311.776.828	0,036
	2020	8.763.294	361.208.406	0,024
	2021	11.139.521	371.868.311	0,036
Mandiri	2019	138.986.941	1.318.246.335	0,105
	2020	119.556.775	1.541.964.567	0,078

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

	2021	*142.587.934*	*1.725.611.128*	*0,083*

In table 4.13, we can find the calculation of the ratio X_2 (*Retained Earning to Total Assets*). The value of *retained earnings to total assets* of the company's commercial banks in 2019 – 2021 is as follows:

1. Bank BRI in 2019 – 2021 consecutively, namely 0.128; 0,104; 0,110.
2. Bank BNI in 2019 – 2021 consecutively, namely 0.098; 0,075; 0,081.
3. Bank BTN in 2019 – 2021 consecutively, namely 0.036; 0,024; 0,036.
4. Bank Mandiri in 2019 – 2021 consecutively, namely 0.105; 0,078; 0,083.

Based on the graph of retained earnings to total assets owned by each bank, it can be seen that from 2019 to 2021 the value of *retained earnings to total assets* was dominated by BRI, then Mandiri, BNI and BTN.

In addition, there was a decrease in 2020 in retained earnings to total assets at each bank. However, the four banks were able to survive again in 2021.

From the calculation of retained earnings on the total assets owned by each bank, it can be seen that the four banks are not able to generate retained earnings as expected. It can be seen that for every Rp. 1.00 of assets, no one has been able to generate retained earnings greater than Rp. 1.00.

c. Earnings Before Interest and Taxes to Total Asset (X_3)

This ratio shows the company's ability to generate profits from company assets before interest and taxes. In other words, this ratio measures the productivity of the company in obtaining profit before tax or interest. The following is the EBIT table of each of the company's commercial banks.

This ratio is calculated by dividing earnings before interest and tax by the total assets owned. The following are the values of *earnings before interest and taxes* presented in table 6.

Table 4 Earning Before Interest And Taxes In 2019 – 2021 (In Million Rupiah)

No	*Bank Name*	*Year*		
		2019	*2020*	*2021*
1	*BRI*	*43.364.053*	*27.612.364*	*38.591.374*
2	*BNI*	*19.369.106*	*5.112.153*	*12.550.987*
3	*BTN*	*411.062*	*2.270.857*	*2.993.320*
4	*Mandiri*	*36.441.440*	*24.392.405*	*38.358.421*

Sumber : www.idx.co.id

Based on the table above, it can be calculated the variable value X3 (Earning Before Interest And Taxes to Total Assets) which is presented in table 4.15 below:

Table 5 Calculation of X3 Ratio (Earning Before Interest And Taxes To Total Assets) of Commercial Banks of Persero for the period 2019 – 2021 (in millions of rupiah)

Bank Name	*Year*	*EBIT (IDR)*	*Total Assets (IDR)*	$X3 = \frac{EBIT}{Total\ Assets}$ *(IDR)*
BRI	*2019*	*43.364.053*	*1.416.758.840*	*0,031*
	2020	*27.612.364*	*1.610.065.344*	*0,017*

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

	2021	*38.591.374*	*1.678.097.734*	*0,022*
BNI	*2019*	*19.369.106*	*845.605.208*	*0,023*
	2020	*5.112.153*	*891.337.425*	*0,006*
	2021	*12.550.987*	*964.837.692*	*0,013*
BTN	*2019*	*411.062*	*311.776.828*	*0,001*
	2020	*2.270.857*	*361.208.406*	*0,006*
	2021	*2.993.320*	*371.868.311*	*0,008*
Mandiri	*2019*	*36.441.440*	*1.318.246.335*	*0,027*
	2020	*24.392.405*	*1.541.964.567*	*0,016*
	2021	*38.358.421*	*1.725.611.128*	*0,022*

From the calculation of table 4.15, namely the ratio X_3 (*Earnings Before Interest And Taxes to Total Assets*), it can be seen that the value of *earnings before interest and taxes to total assets* of commercial banks in 2019 – 2021 is as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.031; 0,017; 0,022.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.023; 0,006; 0,013.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.001; 0,006; 0,008.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.027; 0,016; 0,022.

In addition, we can see that only BTN bank experienced an increase in profit before interest and tax on total assets owned. One of the reasons for the increase in profit is the housing sector mortgage which supports the fertile coffers of BTN's profit which moved positively amid the correction in economic growth due to the pandemic. This also increases the potential in the property sector of Bank BTN and will affect the increase in net profit (www.btn.co.id).

From the calculation of earnings before interest and taxes on the total assets owned by each bank, we can see that the productive assets of banking companies have not been able to generate operating profits as expected. It can be seen that for every Rp. 1.00 asset, it has not been able to generate interest and taxes greater than Rp. 1.00.

d. Book Value of Equity to Book Value of Debt (X_4)

This ratio shows the company's ability to measure the company's ability to manage all of the company's capital against its debts.

This ratio is calculated by dividing the total yield of equity (capital) by the total liabilities (debt) owned. The following is the *book value of equity to book value of debt* (earnings before interest and taxes) presented in table 4.16.

Table 6 Calculation of ratio X4 (Book Value of Equity to Book Value of Debt) (in millions of rupiah)

Bank Name	*Year*	*Total Equity (IDR)*	*Total Liabilities (IDR)*	*X4 = $\frac{Total\ Ekuitas}{Total\ Liabilitas}$ (IDR)*
BRI	*2019*	*208.784.336*	*1.207.974.504*	*0,173*

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

	2020	*229.466.882*	*1.380.598.462*	*0,176*
	2021	*291.786.804*	*1.386.310.930*	*0,210*
BNI	*2019*	*125.003.948*	*720.601.260*	*0,173*
	2020	*112.872.199*	*778.465.226*	*0,145*
	2021	*126.519.977*	*838.317.715*	*0,151*
BTN	*2019*	*23.836.195*	*287.940.633*	*0,083*
	2020	*19.987.845*	*341.220.561*	*0,069*
	2021	*21.406.647*	*350.461.664*	*0,061*
Mandiri	*2019*	*209.034.525*	*1.109.211.810*	*0,188*
	2020	*204.699.668*	*1.337.264.899*	*0,153*
	2021	*222.111.282*	*1.503.499.846*	*0,148*

From the calculation of the ratio X_4 (*Book Value of Equity to Book Value of Debt*), it can be known the *value of book value of equity to book value of debt of* commercial banks of the company for 2019 – 2021 as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.173; 0,176; 0,210.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.173; 0,145; 0,151.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.083; 0,069; 0,061.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.188; 0,153; 0,148

Based on the total capital to total debt owned by each bank, it can be seen that in 2019 the *book value of equity to book value of debt* was dominated by Mandiri, then BRI, BNI and BTN. Then in 2020 the *book value of equity to book value of debt* was dominated by BRI, then Mandiri, BNI and BTN. And in 2021 the value of *total equity to total debt* is dominated by BRI, then BNI, Mandiri and BTN.

In addition, there was a decrease in total equity to total debt at BTN and Mandiri banks. BRI bank has increased every year. Meanwhile, BNI bank which has experienced fluctuating developments.

The decrease in total equity to total debt is marked by an increase in the amount of company debt and a decrease in the value of equity in the company.

From the calculation of total equity with total liabilities at each bank, it can be seen that every Rp. 1.00 total debt can be guaranteed by Rp. 1.00 total equity. In other words, each of these banks has not been able to guarantee its total debt to equity.

2. Z – Score Analysis

Based on the data and calculation results of the four variables above (Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before Interest And Taxes to Total Assets and Book Value of Equity to Book Value of Debt), the next step is to substitute the calculation results of X_1, X2, X3 and X4 into the Z – Score formula as follows:

$$Z = 6{,}56\ X1 + 3{,}26\ X2 + 6{,}72\ X3 + 1{,}05\ X4$$

The "*cut off*" values for this index are:

OUT < 1.1 : Bangkrut
1,1 < Z < 2,6 : Grey Area

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Out of > 2.6 : Save Zone

Information:
X1 = Working Capital To Total Asset
X2 = Retained Earning To Total Asset
X3 = EBIT To Total Asset
X4 = Total Equity to Total Debt Ratio
Z = Overall Index

The results of the Z – Score analysis are classified based on the standard or cut off value of the Z – Score index where if the value of Z – Score < 1.1 then the company is included in the category of bankruptcy (distress zone). For a Z – Score between 1.1 and 2.6, the company is included in the gray area category. Meanwhile, if the Z – Score value > 2.6, then the company is included in the healthy category (save zone).

Table 7 Results of Analysis with the Z - Score Method at Commercial Banks of the Company in 2019 – 2021 (in Millions of Rupiah)

Bank Name	*Year*	*X1*	*X2*	*X3*	*X4*	*With*	*Analysis Results*
BRI	*2019*	*0,112*	*0,128*	*0,031*	*0,173*	*1,54*	*Grey Zone*
	2020	*0,096*	*0,104*	*0,017*	*0,166*	*1,27*	*Grey Zone*
	2021	*0,127*	*0,110*	*0,022*	*0,210*	*1,55*	*Grey Zone*
BNI	*2019*	*0,172*	*0,098*	*0,023*	*0,173*	*1,78*	*Grey Zone*
	2020	*0,127*	*0,075*	*0,006*	*0,145*	*1,27*	*Grey Zone*
	2021	*0,128*	*0,081*	*0,013*	*0,151*	*1,35*	*Grey Zone*
BTN	*2019*	*0,064*	*0,036*	*0,001*	*0,083*	*0,63*	*Distress Zone*
	2020	*0,042*	*0,024*	*0,006*	*0,069*	*0,47*	*Distress Zone*
	2021	*0,036*	*0,036*	*0,008*	*0,061*	*0,47*	*Distress Zone*
Mandiri	*2019*	*0,111*	*0,105*	*0,027*	*0,188*	*0,98*	*Distress Zone*
	2020	*0,079*	*0,078*	*0,016*	*0,153*	*1,03*	*Distress Zone*
	2021	*0,078*	*0,083*	*0,022*	*0,148*	*1,08*	*Distress Zone*

From the results of the calculation of the Z – Score value, it can be seen that the results of the Z – Score analysis of the company's commercial banks for 2019 – 2021 are as follows:

1. Bank BRI's Z – Score for 2019 – 2021 is 1.54; 1,27; 1.55. Bank BRI is included in the gray area category from 2019 – 2021 because it has a Z – Score between 1.1 to 2.6.
2. Bank BNI's Z – Score for 2019 – 2021 is 1.78; 1,27; 1.35. Bank BNI is included in the gray area category from 2019 – 2021 because it has a Z – Score value between 1.1 to 2.6.
3. Bank BTN's Z – Score for 2019 – 2021 is 0.63; 0,47; 0.47. Because Bank BTN's Z – Score value from 2019 – 2021 is below 1.1, Bank BTN is included in the distress zone category.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

4. Bank Mandiri's Z – Score value for 2019 – 2021 is 0.98 consecutively; 1,03; 1.08. In this case, Bank Mandiri is included in the distress zone category because the Z – Score value is below 1.1.

In this case, the greater the Z – Score value indicates the better the company's health level and the better the company's performance.

Based on the results of the Z – Score analysis on the four banks, it can be seen that:

1. Bank BRI and Bank BNI are in the Grey Zone category from 2019 to 2021. This is because the Z – Score is between 1.1 to 2.6 (1.1 > Z > 2.6).
2. Bank BTN and Mandiri experienced a prediction of bankruptcy for 3 consecutive years from 2019 to 2021 and are in the Distress Zone category because the Z – Score value is below the cut off value of 1.1 (Z < 1.1).

B. Discussion of Analysis Results

1. Working Capital to Total Asset (X1)

The higher the value of *working capital to total assets*, indicating the better the performance of a company where existing working capital is able to generate income so that the more effective the use of available working capital in increasing company profitability.

Based on the calculation of *working capital to total assets*, the value of *working capital to total assets* can be known as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.112; 0,096; 0,127.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.172; 0,127; 0,128.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.064; 0,042; 0,036.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.041; 0,079; 0,078

It can be seen that in 2019 the value of *working capital to total assets* was dominated by BNI, then BRI, BTN and Mandiri. Then in 2020 and 2021 the value of *working capital to total assets* was dominated by BNI, BRI, Mandiri and BTN.

2. Retained Earning to Total Asset (X_2)

Based on the calculation of *retained earnings to total assets*, the value of *retained earnings to total assets* can be known as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.128; 0,104; 0,110.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.098; 0,075; 0,081.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.036; 0,024; 0,036.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.105; 0,078; 0,083

It can be seen that from 2019 to 2021 the value of *retained earnings to total assets* was dominated by BRI, then Mandiri, BNI and BTN.

As explained and discussed about retained earnings above, it can be concluded that retained earnings are part of the company's reserve fund which illustrates how the company has the readiness of funds for business development. Therefore, the greater the amount of retained earnings owned, the healthier the company will be in terms of its finances.

3. Earning Before Interest And Taxes to Total Asset (X_3)

Based on the calculation of earnings before interest and taxes to total assets, it can be known the value of the calculation of earnings before interest and taxes to total assets as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.031; 0,017; 0,022.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.023; 0,006; 0,013.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.001; 0,006; 0,008.
d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.027; 0,016; 0,022.

It can be seen that from 2019 to 2021 *earning before interest and taxes to total assets* was dominated by BRI, then Mandiri, BNI and BTN.

Earnings before interest and taxes (EBIT) can be concluded as an indicator to calculate the revenue of a company. Therefore, if the EBIT value is higher, the better, because the EBITTA value obtained will be higher too. And if the EBITTA value is high, it can describe the company is able to generate profits from company assets before tax and interest.

4. Book Value of Equity to Book Value of Debt (X4)

Based on the results of the book value of equity to book value of debt, the calculation value of book value of equity to book value of debt can be known as follows:

a. Bank BRI in 2019 – 2021 consecutively, namely 0.173; 0,176; 0,210.
b. Bank BNI in 2019 – 2021 consecutively, namely 0.173; 0,145; 0,151.
c. Bank BTN in 2019 – 2021 consecutively, namely 0.083; 0,069; 0,061.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

d. Bank Mandiri in 2019 – 2021 consecutively, namely 0.188; 0,153; 0,148

It can be seen that in 2019 the book *value of equity to book value of debt* was dominated by Mandiri, then BRI, BNI and BTN. Then in 2020 the *book value of equity to book value of debt* was dominated by BRI, then Mandiri, BNI and BTN. And in 2021 the value of *total equity to total debt* is dominated by BRI, then BNI, Mandiri and BTN.

The higher the book *value of equity to book value of debt*, the healthier a company is where the company is able to manage all of the company's capital against its debts.

5. Results of Altman Z – Score (Z) Analysis

Based on the calculation results of *the Altman Z – Score* analysis, the calculation results can be known as follows:

a. Bank BRI's Z – Score for 2019 – 2021 is 1.54; 1,27; 1.55. Bank BRI is included in the gray area category from 2019 – 2021 because it has a Z – Score between 1.1 to 2.6.
b. Bank BNI's Z – Score for 2019 – 2021 is 1.78; 1,27; 1.35. Bank BNI is included in the gray area category from 2019 – 2021 because it has a Z – Score value between 1.1 to 2.6.
c. Bank BTN's Z – Score for 2019 – 2021 is 0.63; 0,47; 0.47. Because Bank BTN's Z – Score value from 2019 – 2021 is below 1.1, Bank BTN is included in the distress zone category.
d. Bank Mandiri's Z – Score value for 2019 – 2021 is 0.98 consecutively; 1,03; 1.08. In this case, Bank Mandiri is included in the distress zone category because the Z – Score value is below 1.1.

In this case, the greater the Z – Score value indicates the better the company's health level and the better the company's performance so that it can avoid indications of bankruptcy.

IV. CONCLUSION

1. The Altman Z – Score variable can be used in assessing and predicting the bankruptcy rate of commercial banks of the Company.
2. Overall, the Altman Z – Score model can be used to assess and predict the bankruptcy rate of commercial banks for the period 2019 – 2021. From 2019 to 2021, Bank BRI and BNI are in the *Grey Zone* category because they show Z – Score results between 1.1 and 2.6 ($1.1 < Z < 2.6$) while BTN and Mandiri banks are in the *Distress Zone* category because the Z – Score value is below 1.1.

The results of the Z – Score calculation above, the four banks are in the Grey *Area* and *Distress Area* categories due to working capital, retained earnings and operating profits that are smaller than their total assets, as well as the amount of debt that is greater than their total equity. The chances of bankruptcy will certainly be greater if the company's management does not immediately make improvements or evaluate the company's financial condition. Improving company performance at each bank can help anticipate the possibility of bankruptcy. Therefore, each bank must continue to apply its prudent principles and continue to strive to improve company performance so that the potential for financial distress and company bankruptcy is also getting smaller.

A. Sugesstions

Based on the conclusions above, the company's management should be more careful in managing assets. Making too large an investment in receivables is also dangerous and can affect capital and cause the company's performance to be disrupted. By knowing the level of bankruptcy prediction of banking companies, especially commercial banks, it is expected to help companies to anticipate the risk of company bankruptcy and be able to make early improvement efforts.

The results of the study can be used as a reference for further research on financial distress analysis to predict the bankruptcy rate of commercial bank companies. In addition, it is expected that future research can use other bankruptcy prediction models so that they can be used as a comparison in predicting the company's bankruptcy rate and with a longer period or period of time.

REFERENCES

Altman, E. I., Hotchkiss, E., & Wang, W. (2019). *Corporate Financial Distress, Restructuring, and Bankruptcy: Analyze Leveraged Finance, Distressed Debt, and Bankruptcy*. Wiley.

Duli, N. (2019). *Metodologi Penelitian Kuantitatif: Beberapa Konsep Dasar Untuk Penulisan Skripsi & Analisis Data Dengan SPSS*. Deepublish.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Emilia, D. R. (2018). *Pengaruh Kinerja Keuangan Terhadap Profitabilitas Bank Umum Milik Negara (BUMN) Di Indonesia*. University of Muhammadiyah Malang.

Gobenvy, O. (2013). *Pengaruh Profitabilitas, Likuiditas dan Leverage dalam memprediksi Financial Distress*. STIE Widyagama, Lumajang.

Metode_Penelitian_Kuantitatif_dan_Kualit. (n.d.).

Platt, H. D., & Platt, M. B. (2002). Predicting corporate financial distress: Reflections on choice-based sample bias. *Journal of Economics and Finance*, *26*(2), 184–199.

Prihadi, T. (2019). *Analisis Laporan Keuangan*. Gramedia Pustaka Utama.

Rukajat, A. (2018). *Pendekatan Penelitian Kuantitatif: Quantitative Research Approach*. Deepublish.

Sarwani, S., & Sunardi, N. (2019). Analisis Penggunaan Altman Z-Score untuk Mengetahui Potensi Kebangkrutan Industri KonstruksI (BUMN) di Indonesia Tahun 2013-2017. *Proceedings Universitas Pamulang*, *1*(1).

Simanjuntak, C. E. B., Krist, F. T., & Aminah, W. (2017). Pengaruh Rasio Keuangan Terhadap Financial Distress. *EProceedings of Management*, *4*(2). https://openlibrarypublications.telkomuniversity.ac.id/index.php/management/article/view/1411

Sugiyono. (2018). *Metode Penelitian Kuantitatif* (Setiyamawi (Ed.)). CV Alfabeta.

Supriadi, I. (2020). *Metode Riset Akuntansi*. Deepublish.

Vogt, W. P., & Johnson, R. B. (2015). *The SAGE dictionary of statistics & methodology: A nontechnical guide for the social sciences*. Sage publications.