

Bankruptcy Prediction Analysis in State-Owned Banks Listed on the Indonesian Stock Exchange (IDX)

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ABSTRACT

A healthy bank will affect the overall economic system of a nation because it regulates the money circulation. On average, state banks relatively have larger capital than private banks. However, in the banking world, the competitive advantage of a bank is not only influenced by the size of a bank's capital, but there are many contributing factors. This study examines the analysis of bankruptcy predictions in state-owned banks listed on the Indonesian Stock Exchange (IDX), by using financial ratios developed into methods such as Altman, Springate and Grover because they are still rare in Indonesia. Despite studies on bankruptcy analysis are still rare, the analysis is purposed to determine the soundness level of state-owned banks listed on the Indonesian Stock Exchange so that there is an overview can be resulted for company management, both external and internal, then they ultimately can continue to survive the growing business competition. Based on the results of the study, it was found that with the Z-score and Springate methods, BRI, BNI and BTN banks were predicted to experience bankruptcy risk. On the other hand, the prediction results on the grover method show that the three banks do not experience bankruptcy risk. Bank Mandiri is predicted based on the Zscore Method at risk of bankruptcy, but there are differences in 2016 and 2017. The prediction results for that year are in the gray area. However, in 2018 and 2019 the score decreased so that Bank Mandiri's predictions were at risk of going bankrupt. The prediction results of the Springate method show that Bank Mandiri is at risk of bankruptcy from 2015 to 2019. However, the Grover method predicts that Bank Mandiri is not at risk of bankruptcy.

Keywords: Bankruptcy Analysis, Altman Z-score, Grover

INTRODUCTION

Bank health is very important for everyone, including the owners, managers, people who use the bank's services, and the government. In this case, Bank Indonesia is the bank that supervises the bank [1]. A healthy bank will have an impact on the overall economy of a country because it controls the flow of money. It's important for banks to keep their health up because it shows how well they're doing, which helps the supervisory authority figure out what to do and where to focus its attention. Banks are a type of financial institution that can do a lot of different things. They have to deal with a lot of risks because of this. If the bank doesn't find and deal with risks as soon as possible, it could lose money. The risk can range from a decrease in the soundness level of the bank to the risk of the bank going out of business. Bankruptcy is when a company doesn't have enough money to run because it doesn't make any money anymore. As a result, the company can no longer pay off its debts as a debtor until the company is sold off.

Investors and creditors need to know about a company's bankruptcy in order to protect their money [2-4]. Bankruptcy is very common in Indonesia, where many banks go out of business. In November 1997, 16 banks were shut down in Indonesia, and the country was plunged into a poverty rate that rose dramatically, reaching 49,5 million people. People were poorer in 1999, but it was worse than in 1998. The poverty rate has gone down a little.

Having a lot of money doesn't mean that the bank is efficient, so it can become a bank that does well [5, 6]. Because banks manage public funds, it's very important to check a bank's health [7]. Bank health assessments are important because they show how well a bank is run and what direction it will go in both individually and as a whole. They also show how well the bank is run and what rules it has to follow [8]. People who do this assessment want to know if the bank is in good shape or if it is in bad shape [9].

It was done at state-owned banks because state banks have a lot of money in the market, and this study was done at the state-owned banks. Study results can be used by commercial banks to figure out how well each company is doing. The performance of state-owned banks has a big impact on how well national banks do. In general, if state-owned banks do well, the rest of the banking industry will also do well.

State banks, on average, have more money than private banks. However, in the banking world, a bank's competitive advantage isn't just based on how much money it has. There are many other things that play a role. Bankruptcy prediction analysis results can be used to keep people inside and outside the company from losing money if the company goes bankrupt, as well as to predict how long the company will last [10].

Financial ratios like Altman, Springate, and Grover are used in this study to look at state-owned banks that are on the Indonesian Stock Exchange (IDX). Because they aren't very common in Indonesia, they are used in this study. Despite the fact that bankruptcy studies are still very rare, this analysis is meant to find out how well state-owned banks on the Indonesian Stock Exchange (IDX) are run. This way, company managers, both inside and outside, can see how well they are run, so they can keep up with the growing business competition.

LITERATURE REVIEW

Bank Financial Report

The basic framework for arranging and presenting standard financial accounting reports, financial statements are part of the financial reporting process. A complete financial statement usually includes balance sheet, income statement, changes in

financial position statement (which can be presented in various ways, for example, as cash flow statement), notes and other reports as well as explanatory material which is an integral part of financial report [11].

According to Indonesian Accountants Association (2012) in PSAK No.31 concerning Banking Accounting, bank financial statement consists of: a) Balance sheets, banks present assets and liabilities in balance sheets based on their characteristics and are arranged based on their liquidity. b) Profit and loss statements, it presents in detail the elements of income and expenses, and distinguishes it between operating and non-operational activities. c) Cash flow statements, cash flow statements must report cash flows during a certain period and are classified according to operating, investing and financing activities. d) Equity changes statements, which present the increase and decrease in net assets or bank assets during the period concerned based on certain measurement principles adopted and must be disclosed in the financial statements. e) Notes to financial statements, it must be presented systematically.

Bank Financial Ratios

Harahap (2011) states that "Financial ratios are a tool that is widely used by analysts to analyze a company condition in a certain period of year". It is a number resulted from a comparison of one financial report item with other items that have a relevant and significant relationship.

The types of Bank financial ratios include:

1. Bank liquidity ratio, i.e. the ratio used to measure how much liquid a bank has in serving its customers. This ratio consists of, among others: 1) Quick ratio, 2) Investing policy ratio, 3) Banking ratio, 4) Assets to loan ratio, 5) Investment portfolio ratio.

2. Bank solvability ratio, i.e. the ratio used to measure the effectiveness of a bank in achieving its objectives. This ratio consists of, among others: 1) Primary ratio, 2) Risk assets ratio, 3) Secondary risk ratio, 4) Capital ratio, 5) Capital risk.

3. Bank profitability ratio, i.e. the ratio used to measure the level of business efficiency and profitability achieved by the bank in a certain period. This ratio consists of, among others: 1) Gross profit margin, 2) Net profit margin, 3) Return on equity capital, 4) Return on total assets, 5) Rate of return on loan.

Bankruptcy

[12] states that "A company can be said to be bankrupt if it experiences minor difficulties (such as liquidity problems), to more serious difficulties, namely solvable (debt is greater than assets)". While [13] states that "Bankruptcy is a company's inability to fulfill its responsibilities".

[14] States that, "Bankruptcy in failure can be defined as economic failure and financial failure". In addition, [15] states that "Liquidity is a risk experienced by a company because of its inability to fulfill its short-term obligations, so that it disrupts the company's activities".

[16] states that "Bankruptcy is a condition in which a company is no longer able to pay off its obligations". Based on the definition suggested by many experts, the authors conclude that bankruptcy is a condition where company no longer able to meet its mandatory needs, or is experiencing financial failure.

Factors of Bankruptcy

In general, bankruptcy is defined as the failure experienced by a company in its operations to achieve its goals. Therefore, it is very important to understand various types of failures that may occur in a company. According to [17], there are three types of failure in the company:

1) A company that is said to be technically insolvent, i.e. if it cannot fulfill its obligations which are due immediately, but the company's assets is higher than its debts.

2) The company that is legally insolvent, i.e. if the value of its assets is higher than its debts.

3) A company that is facing bankruptcy, i.e. if it is unable to pay its debts and is declared as bankrupt by the court.

[18] stated that the causes of financial difficulties and bankruptcy are quite varied. The type of industry itself also affects the causes of business failure. The following are factors that cause business failure in general:

1) Lack of operational experience

2) Lack of managerial experience

3) Unbalanced experience between finance, production and other functions, incompetent management, fraud, disaster, negligence.

Benefits of Bankruptcy Information

Hanafi and [19] stated that bankruptcy information can be useful for several parties, includes:

1. The lender (such as the bank)

Bankruptcy information can be useful for making decisions about who will be given a loan, as well as useful for monitoring policies on existing loans.

2. Investor

Investors of stocks or bonds issued by a certain company will be very benefited from information on bankruptcy possibility of the company selling the securities. Investors who adhere to an active strategy will develop a bankruptcy prediction model to look for signs of bankruptcy as early as possible and then anticipate the possibility.

3. The government

In several business sectors, government agencies have responsibility to oversee the operation of the business (eg the banking sector). In addition, the government also has business entities (BUMN) which must always be supervised. It is in the interest of government agencies to see signs of bankruptcy as early as possible so that anticipations can be taken earlier.

4. Accountants

Accountants are those interested parties in information regarding the continuity of a business because accountants will assess the going concern ability of a company.

5. Management

Bankruptcy means the costs associated to bankruptcy and the value is quite large. A study shows the cost of bankruptcy can reach 11-17% of the company's value. Examples of direct bankruptcy costs are accountant fees and legal advisory fees. Meanwhile, examples of indirect bankruptcy costs are the loss of sales opportunities and profits due to several things such as restrictions that may be imposed by courts. If management can detect this bankruptcy early, it can take economization measures, for example by conducting a merger or financial restructuring so that bankruptcy costs can be avoided.

Bankruptcy Predictions

[20] states that: Bankruptcy can be predicted long before the company goes bankrupt. Therefore, bankruptcy cannot be detected in a short time. However, the time used is usually two to five years as a tolerance for decreased performance to detect the possibility of company bankruptcy. [21] stated that "The ability to predict bankruptcy will benefit many parties, especially creditors and investors. This prediction also serves as a guidance for the parties regarding the company's financial performance whether it will experience financial difficulties or not in the future. Thus,

as an external party of a company, investors should have knowledge on bankruptcy so that they can make the right decisions.

Based on several theories suggested, it can be seen that in predicting bankruptcy we can find out the company's financial condition in the future. This can be seen from components used in the formula as a predictor of whether a company will be bankrupt or not.

METHODS OF STUDY

This study is a quantitative descriptive analysis study. This was conducted by collecting secondary data in the form of financial reports of the state-owned banks listed on the Indonesian Stock Exchange (IDX) from 2015 to 2019. This study was conducted by analyzing the financial ratios of the selected companies for predicting bankruptcy among state-owned bank companies listed on the Indonesian Stock Exchange (IDX). The measures taken in the data analysis technique are calculating financial ratios in the Z-score, Springate and Gover methods and the results are then analyzed using the formula for each bankruptcy prediction method.

RESULTS AND DISCUSSION

Calculating the Z-Score, S-Score and G-Score

1) Z-score Method

Table 1.

Results of the Z-Score Calculation for State-Owned Banks listed on the Indonesian Stock Exchange (IDX) in 2015-2019 period.

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	0,93	1,72	1,20	1,13	1,21
2	BANK NEGARA INDONESIA	BBNI	1,80	1,74	1,67	0,82	1,79
3	BANK TABUNGAN NEGARA	BBTN	-2,65	-1,33	1,10	1,04	0,96
4	BANK MANDIRI	BMRI	1,63	1,87	1,92	1,71	1,79

Source: Primary Data Processed, 2020

2) Springate Method (S-score)

Table 2.

Results of the S-Score Calculation for State-Owned Banks listed on the Indonesian Stock Exchange (IDX) in 2015-2019 period.

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	0,470	0,616	0,540	0,520	0,541
2	BANK NEGARA INDONESIA	BBNI	0,482	0,466	0,460	0,334	0,521
3	BANK TABUNGAN NEGARA	BBTN	0,335	-0,177	0,207	0,193	1,192
4	BANK MANDIRI	BMRI	0,471	0,451	0,479	0,481	0,505

Source: Primary Data Processed, 2020

3) Grover Method

Table 3.

Results of the G-Score Calculation for State-Owned Banks listed on the Indonesian Stock Exchange (IDX) in 2015-2019 period.

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	0,214	0,401	0,266	0,249	0,266
2	BANK NEGARA INDONESIA	BBNI	0,430	0,422	0,406	0,194	0,419
3	BANK TABUNGAN NEGARA	BBTN	-0,870	-0,314	0,300	0,289	0,268
4	BANK MANDIRI	BMRI	0,351	0,440	0,463	0,409	0,421

Source: Primary Data Processed, 2020

Calculation of ratios used as variables in the Z-Score, Springate, and Grover methods.

Z-score Method

Based on the results of the Z-Score calculation, the classification can be made. If the Z-Score is greater than 2,99 then the company is classified into a healthy company or is not at risk of bankruptcy. If the Z-Score is between 1,81 to 2,99, then the company is classified into a company in the grey area where the opportunity to be saved or bankrupt depends on the decisions and policies of company management. Meanwhile, if the Z-Score is less than 1,81, it is classified into a company that has financial difficulties or has the potential to go bankrupt.

The ratio used in the calculation of the Z-score model consists of four ratios, namely X1 – X4. The X1 ratio shows company's ability to generate net working capital from its total assets. Furthermore, the X2 ratio shows company's ability to generate retained profit from company's total assets. The X3 ratio shows company's ability to generate profits from the company's assets before interest and taxes. Meanwhile, the X4 ratio shows company's ability to meet its obligations from its own capital market value (common stocks). Based on table 4:16, the classification of Z-Score calculation results for state-owned banks listed on the Indonesian Stock Exchange (IDX) for 2015-2019 period is as follows.

Table 4.

Classification of the Z-score Method Calculation Results for 2015-2019

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	B	B	B	B	B
2	BANK NEGARA INDONESIA	BBNI	B	B	B	B	B
3	BANK TABUNGAN NEGARA	BBTN	B	B	B	B	B
4	BANK MANDIRI	BMRI	B	GREY	GREY	B	B

Source: Primary Data Processed, 2020

Information: TB = No Risk of Bankruptcy, GREY = Grey Area, B = Risk of Bankruptcy

On average, the results of the Z-Score calculation show that the four state-owned banks have unhealthy financial conditions and some are in grey areas. This can be seen from the results of the Z-Score calculation for 2015-2019 period, which shows a value below 1,81 meaning that the four state-owned banks listed on the Indonesian Stock Exchange (IDX) are considered to have the potential to go bankrupt. The results of the Z-score calculation is depicted in the below figure:

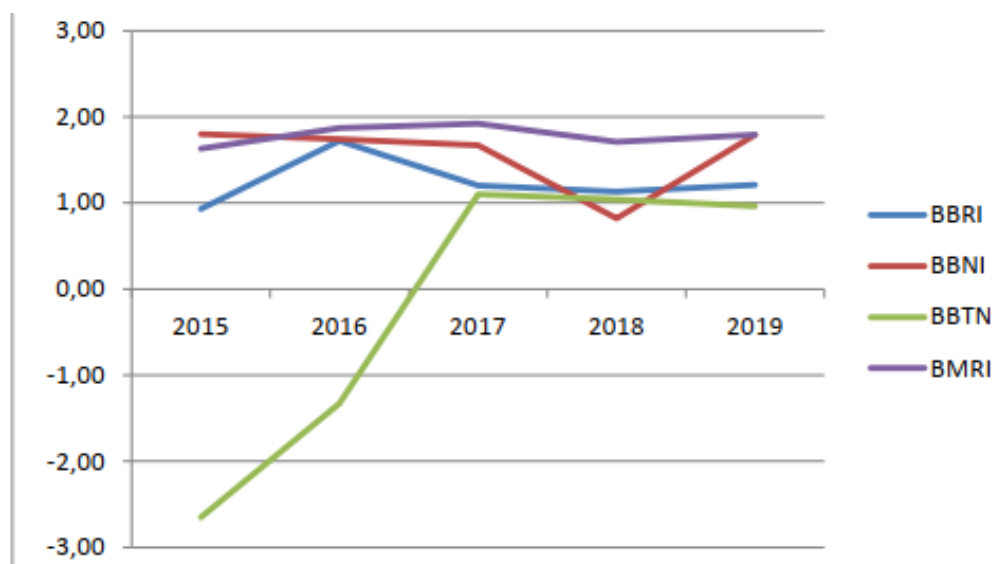


Figure 1. The Graphic of the Z-score Calculation Results

It can be seen from the figure above that there was a classification with minor difference each year among the four state-owned banks listed on the Indonesian Stock Exchange (IDX) during the last five years. There were three banks that are at risk of bankruptcy in the last five years, and one bank was positioned in the grey area in 2016 and 2017. In 2015, the Z-score of the four state-owned banks listed on the Indonesian Stock Exchange (IDX) was far below the cut-off value. Whereas Bank Mandiri has a score of 1,87, an increase compared to the previous year's score. This is influenced by the increase in X1 (liquidity ratio) which results in a cut off value in the grey area, followed by an increase of 1,92 on the Z-score in 2017, meaning that it is also positioned in the grey area. Then in 2018 to 2019 period, the four state-owned banks experienced a cut-off value that was at risk of bankruptcy, meaning that they were considered unhealthy or at risk of bankruptcy.

This decrease was influenced by the decrease on X1 value. From the classification results on the Z-score method, in general, the four state-owned banks are at risk of bankruptcy. In fact, the four banks are still survived until today. Thus, the researcher concludes that the Z-score method is not appropriate for predicting bankruptcy among the state-owned bank companies which are listed on the Indonesian Stock Exchange (IDX).

Springate Method (S-score)

A classification was made based on the results of the S-Score calculation. If the S-Score value is greater than 0,862, the the company is considered as healthy or is not at risk of bankruptcy. On the contrary, if the S-Score is smaller than 0,862, the company is considered unhealthy or at risk of bankruptcy.

There are four ratio used in the Springate model calculation, namely X1 ratio which shows the amount of working capital to finance operational activities; X2 ratio which shows the amount of net profit before interest and taxes resulting from the use of assets; X3 ratio which shows the amount of net profit before tax and is available to cover current debts; and X4 ratio which shows the amount of income generated from the use of assets. Based on table 4:21, the classification of the S-Score calculation results for state-owned banks listed on the Indonesian Stock Exchange in 2015-2019 are as follows:

Table 5.

The Classification of the S-Score calculation results in 2015 – 2019

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	B	B	B	B	B
2	BANK NEGARA INDONESIA	BBNI	B	B	B	B	B
3	BANK TABUNGAN NEGARA	BBTN	B	B	B	B	TB
4	BANK MANDIRI	BMRI	B	B	B	B	B

Source: Primary Data Processed, 2020

The results of the Springate calculation showed that the four state-owned banks listed on the Indonesian Stock Exchange have unhealthy financial conditions or are at risk of bankruptcy. This can be seen from the results of the S-Score calculation in 2015-2019 period, which shows a value below 0,862 meaning that the four banks are considered to be at risk of bankruptcy. The results of the calculation are depicted in the figure below:

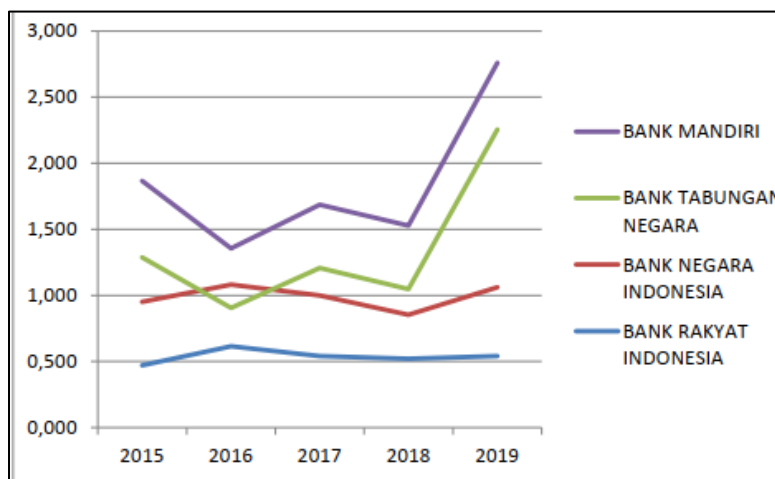


Figure 2. Graphic of the S-Score Calculation Results

In 2015-2018, the S-Score of the four state-owned banks was far below the cut off value. Therefore, the four state-owned banks listed on the Indonesian Stock Exchange (IDX) are classified as being at risk of bankruptcy. However, in 2019 Bank BTN had a cut-off value of 1,19 meaning that it is classified as not at risk of bankruptcy. The score is influenced by a very significant increase in X3, however the other three banks are still in a position prone to bankruptcy because they have an X3 score which has not increased.

Based on the classification results by using the S-score method, in general, the four state-owned banks are at risk of bankruptcy during the 2015 to 2019 period, In fact, the four state-owned banks are still survived until today. Thus, the researcher concluded that the S-score method is less appropriate to predict bankruptcy among the state-owned banks.

Grover Method (G-Score)

Based on results of the G-Score calculation, the classification was made on the score. If the G-Score is greater than or equal to 0,01, the company is considered to be healthy or is not at risk of bankruptcy. However, if the G-Score is less than or equal to -0,02, the company is considered to be unhealthy or is at risk of bankruptcy. There are three ratios used in the calculation of grover method, namely ratio X1 which shows the amount of working capital available for operational activities; X2 ratio which shows the amount of profit before interest and tax which is generated from the use of assets; and

ROA which shows the amount of net profit after tax and was generated from the use of assets; Based on table 4:26, the classification of the G-Score calculation results for the state-owned banks listed on the Indonesian Stock Exchange (IDX) in 2015-2019 period is as follows:

Tabel 6.

Classification of the G-score Calculation Results for 2015-2019 period

NO	NAME OF BANK	CODE	2015	2016	2017	2018	2019
1	BANK RAKYAT INDONESIA	BBRI	TB	TB	TB	TB	TB
2	BANK NEGARA INDONESIA	BBNI	TB	TB	TB	TB	TB
3	BANK TABUNGAN NEGARA	BBTN	TB	TB	TB	TB	TB
4	BANK MANDIRI	BMRI	TB	TB	TB	TB	TB

Source: Primary Data Processed, 2020

The results of the G-Score calculation show that the four state-owned banks listed on the Indonesian Stock Exchange have sound financial conditions or are not at risk of bankruptcy. This can be seen from the results of the S-Score calculation for 2015-2019 period, which resulted in a cut-off value above 0,01 and greater than -0,02, meaning that the four banks were considered not to be at risk of bankruptcy. The calculation results by using the grover method are depicted in the figure below:

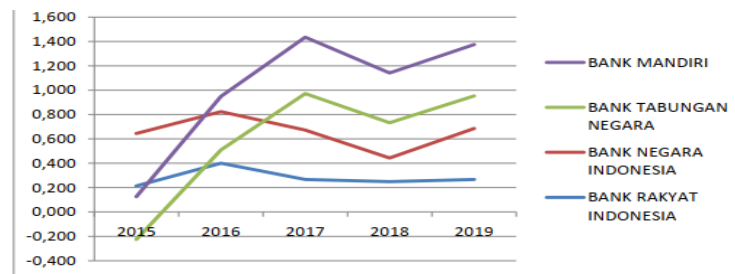


Figure 3. Graphic of G-Score Calculation Results

In 2015-2019, the G-Score of the four state-owned banks was above the cut off value. It means that the four state-owned banks listed on the Indonesian Stock Exchange (IDX) are classified as not at risk of bankruptcy, and in fact the four banks have survived until today. From these results, the author concluded that the Grover method is appropriate for predicting bankruptcy among the state-owned banks.

Comparing the Prediction Results of the Z-score, Springate, and Grover Methods

The calculation results and predictions by using the Z-score, Springate, and Grover methods showed that there are differences found among state-owned banks listed on the Indonesian Stock Exchange (IDX). The differences in the predicted results between the Z-score, Springate, and Grover methods are as follows:

Code: BBRI

Year	Z-Score		Springate		Grover	
	Score	Information	Score	Information	Score	Keterangan
2015	0,93	At risk	0,470	At risk	0,214	Not at risk
2016	1,72	Grey Area	0,616	At risk	0,401	Not at risk
2017	1,20	At risk	0,540	At risk	0,266	Not at risk
2018	1,13	At risk	0,520	At risk	0,249	Not at risk
2019	1,21	At risk	0,541	At risk	0,266	Not at risk

Source: Primary Data Processed, 2020

Code: BBNi

Year	Z-Score		Springate		Grover	
	Score	Information	Score	Information	Score	Information
2015	1,80	At risk	0,482	At risk	0,430	Not at risk
2016	1,74	At risk	0,466	At risk	0,422	Not at risk
2017	1,67	At risk	0,460	At risk	0,406	Not at risk
2018	0,82	At risk	0,334	At risk	0,194	Not at risk
2019	1,79	At risk	0,521	At risk	0,419	Not at risk

Source: Primary Data Processed, 2020

Code: BBTN

Year	Z-Score		Springate		Grover	
	Score	Information	Score	Information	Score	Information
2015	-2,65	At risk	0,335	At risk	-0,870	Not at risk
2016	-1,33	At risk	-0,177	At risk	-0,314	Not at risk
2017	1,10	At risk	0,207	At risk	0,300	Not at risk
2018	1,04	At risk	0,193	At risk	0,289	Not at risk
2019	0,96	At risk	1,192	Not at risk	0,268	Not at risk

Source: Primary Data Processed, 2020

Code: BMRI

Year	Z-Score		Springate		Grover	
	Score	Information	Score	Information	Score	Information
2015	1,63	At risk	0,580	At risk	0,351	Not at risk
2016	1,87	Grey Area	0,451	At risk	0,440	Not at risk
2017	1,92	Grey Area	0,479	At risk	0,463	Not at risk
2018	1,71	At risk	0,481	At risk	0,409	Not at risk
2019	1,79	At risk	0,505	At risk	0,421	Not at risk

Source: Primary Data Processed, 2020

Based on the prediction results above, in general, the Z-score and Springate methods predict that the four banks are at risk of experiencing bankruptcy and some are in the grey area. Meanwhile, the Grover method predicts that the four banks are not at risk of experiencing bankruptcy.

CONCLUSION

Based on the study results, it can be concluded that (1) there are two methods stating that Bank BRI is predicted to experience the bankruptcy risk, i.e. the Z-score and Springate, whereas the grover method does not predict the bankruptcy risk. (2) the Z-score and Springate methods predict that Bank BNI is generally at risk of experiencing bankruptcy, which is different from the prediction results of the Grover method. Although the scores resulted on the Grover are smaller than the scores

obtained in the Z-score and Springate methods, the prediction results obtained are different compared to the previous two methods. The prediction results of the Grover method state that Bank BNI does not experience the risk of bankruptcy. (3) Based on the calculation results, the prediction score generated by the Z-score and Springate methods are generally at risk of experiencing bankruptcy. The grove method predicts that from 2015-2019 period, Bank BTN is not at risk of experiencing bankruptcy, in 2015 and 2016, the score obtained is negative but does not change the prediction. This is happened because the score obtained from year to year is above the predetermined cut off value. (4) Based on the score resulted, the prediction results of the Z-score, Springate, and Grover methods show differences. If the previous three banks were observed, the prediction results of the Z-score and Springate methods are not much different, but the result is different for Bank Mandiri. On average, the Z-score method suggests prediction results that are at risk of bankruptcy, but there are differences in 2016 and 2017. The prediction results for those periods are in the grey area because the score generated is greater than the other years. However, the score has decreased in 2018 and 2019 so that the prediction results obtained are that Bank Mandiri is at risk of bankruptcy. The prediction results on the Springate method stated that Bank Mandiri is at risk of bankruptcy from 2015-2019. On the other hand, the Grover method suggests different results compared to the previous two methods. It predicts that Bank Mandiri is not at risk of experiencing bankruptcy even though the scores generated are smaller than the scores obtained from the Z-score and Springate methods. (5) The occurrence of different prediction results in each method is due to the different cut off value set by each method.

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