Methods For Measuring Potential Bankruptcy Of Sharia Banking

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Keywords:	**ABSTRACT**
Method, Measure, Bankruptcy Potential,	*This study aims to examine the methods that can be used to measure bankruptcy in Syariah banks. This study is also to examine the potential for bankruptcy which is most effectively used. The method used is descriptive qualitative method with a literature approach. The results showed that of the six bank measurement methods, all of them could not be used to measure bankruptcy in Syariah banks without being modified first. This is because all methods have constituent elements based on interest and taxes. All methods can be used when eliminating the elements of interest and taxes. However, based on the research, it was found that the most widely used method to measure bankruptcy is the Altman Z-Score model, but the Springate S-score is the most effective in detecting the bankruptcy of Syariah banks in Indonesia.*
Kata Kunci:	**ABSTRAK**
Metode, Mengukur, Potensi Kebangkrutan.	Penelitian ini bertujuan untuk mengkaji metode-metode yang dapat digunakan untuk mengukur potensi kebangkrutan pada Bank Syariah dan mengkaji metode yang paling efektif digunakan. Metode yang digunakan adalah metode kualitatif deskriptif dengan pendekatan kepustakaan. Hasil penelitian menunjukkan dari enam metode pengukuran bank semuanya tidak bisa digunakan untuk mengukur kebangkrutan pada bank syariah tanpa dimodifikasi terlebih dahulu. Hal tersebut karena semua metode memiliki unsur pembentuk berdasarkan bunga dan pajak. Semua metode dapat digunakan apabila memodifikasi unsur bunga dan pajak digantikan dengan nisbah bagi hasil dan zakat. Namun berdasarkan penelitian ditemukan bahwa metode yang paling banyak digunakan untuk mengukur kebangkrutan adalah model Altman Z-Score, namun Springate S-score lah yang paling efektif dalam mendeteksi kebangkrutan bank Syariah di Indonesia.

INTRODUCTION

Sharia economic growth in recent years has shown a fairly good value. This growth is marked by increasing public awareness of Sharia. Including the high public interest in Islamic economics majors. The government also provides fresh air and better support. Likewise with Islamic financial institutions in the form of Commercial Banks and Islamic People's Financing Banks. This growth also gives birth to the potential for higher competition. With the hecticity of Islamic financial institutions, the potential risk of managing Islamic financial institutions is also getting higher. Based on information from the online news portal economi.okezone.com, about 103 banks in Indonesia went bankrupt within a period of time 2006 – 2020. (Rina Anggraeni, n.d.) Generally, the bank that went bankrupt due to liquidation was a Rural Bank (BPR). One of them that had invited controversy was Century Bank. Most of these banks are rural banks whose main reason is that they cannot compete with existing commercial banks.

Meanwhile, based on information published by the Deposit Insurance Corporation (LPS) in the last five years (2016-2021) there were 51 banks that were liquidated, including those that will be liquidated in 2021. Among these BPRs, there were seven BPRs labeled Sharia which were also liquidated.(LPS, 2021) The high level of liquidation of BPRs including BPRS in Indonesia is the main cause of the inability of BPRs and BPRS to compete with commercial banks.

The high level of liquidation of banks in Indonesia is not only due to the inability to compete with other banks but also due to the absence of early detection of potential bankruptcy. The use of detection of potential bankruptcy is only done by academics for research purposes. Because it is mostly used by academics and researchers, not all existing banks can be affordable for research, and it is not possible to implement it all the time.

In 2021 the performance of Bank BTPN Syariah will improve, by continuing to improve performance and maximum performance. Financing can also be maximized as a source of business to obtain maximum profit. With good performance, it will increase the interest of funding customers to place funds, which then the funds will be distributed to productive financing for SMEs. After the pandemic, SMEs also rose again so that opportunities for financing distribution could be opened better. Moreover, the BTPN Syariah bank is a bank that only distributes financing for pre-prosperous MSME businesses, so that each of its products will benefit many people.(Trimulato, 2022)

Calculation and assessment of the soundness of Islamic banks using the CAMEL factor (capital, assets, earnings and liquidity) show that the three Islamic banks that are the object of the study are classified as healthy. Meanwhile, the results of calculations using the Altman Z-Score Multiple Discriminant Analysis (MDA) method on three samples of Islamic banks give the result that all banks are classified as bankrupt in each year, namely the period 2007-2010. Therefore, it can be said that there are differences in the results of the assessment of the two methods. The application of the MDA method is not applicable if it is carried out in banking, this statement is supported by the results of previous studies. This is because the characteristics of banking as a financial intermediary are much different from the characteristics of other companies. With this function, it implies that banks have smaller current assets (current assets) than current liabilities (current liabilities). By ignoring the year and type of bank to make it easier to process data, the researcher created a new discriminant function. The new discriminant function gives varied results and tends to be average, namely, four banks are classified as bankrupt, three banks are gray area and five others are classified as health.(Hosen & Nada, 2013)

Besides the lack of early detection from banks of potential bankruptcy, it is also because there is no standard method used for detecting bankruptcies against banks. In generaly the researcher only uses the Altman Z-Score, Springate, Zmijewski, Foster and Grover method as a tool to detect potential bankruptcy by utilizing financial ratios. Likewise, the detection of potential bankruptcy for banks, both commercial banks, rural banks and BPRS as well as Sharia banking.

The potential for bankruptcy is a current condition describing the future possibility of causing bankruptcy. This potential is one of the potential risks that must be anticipated by every type of business, including banking. According to Oktariani, the risk of bankruptcy is the failure experienced by the company in carrying out the company's operations to earn a profit. Meanwhile, according to Abrori, one of the tools that can be used to avoid the risk of bankruptcy is to utilize the analysis of the financial statements owned. From the description above, the main problems can be formulated, namely; What methods can be used to measure the potential for bankruptcy in Sharia banking? What is the most effective method of measuring the potential for bankruptcy in sharia banking?

THEORETICAL REVIEW

Based on the regulation of the Financial Services Authority (OJK) number 18 of 2016 concerning the application of risk management for commercial banks, it is stated that banks are required to implement effective risk management, both for individual banks and for banks in consolidation with subsidiary companies. The implementation of risk management is intended to at least include; 1) active supervision of the Board of Directors and the Board of Commissioners, 2) the adequacy of Risk Management policies and procedures as well as the application of Risk limits, 3) the adequacy of the risk identification, measurement, monitoring and control processes, as well as Risk management information management, and 4) a comprehensive control system.(OJK, 2016)

In order to manage risk, banks need instruments to be able to carry out the process of identification, measurement for monitoring and controlling. The instrument that is often used is the analysis of financial performance ratios using financial performance ratios. However, the instrument is only able to identify the conditions that occur, it cannot be used to detect conditions and potential risks in the future. So that the potential risk in this case the potential for bankruptcy can still not be detected early.

Sharia Banking

Sharia Banking is a bank that operates on the basis of Sharia principles. According to OJK, Sharia banking are banks that operate in accordance with Sharia principles. The implementation of sharia principles is the main differentiator with conventional banks.(OJK, n.d.) The sharia principle refers to Islamic sharia which is primarily guided by the Al-Quran and Hadith (Isman & Putra, 2022). So that Sharia banking should be an illustration of the application of asset management in an Islamic society (Muchlis & Sukirman, 2016). The most basic difference between Sharia banking and commercial banks is in the application of compensation for customers, where Sharia banking use profit sharing ratios and commercial banks use interest.

Sharia banking or Islamic banking is a banking system whose implementation is based on Islamic law (sharia) (Kara, 2013). The establishment of this sharia banking system is based on the prohibition in Islam to lend or collect loans by charging interest on loans (usury), as well as the prohibition to invest in (haram) businesses. The conventional banking system cannot guarantee the absence of these things in their investments, for example in businesses related to the production of haram food or beverages, non-Islamic media or entertainment businesses, and so on.(Nugroho. et al, 2020)

Bankruptcy

According to Karina, bankruptcy is a condition where the company is no longer able to pay off its obligations. This condition usually does not just appear in the company, there are early indications of the company which can usually be recognized earlier if the financial statements are analyzed more carefully in a certain way. Financial ratios can be used as an indication of bankruptcy in the company. Bankruptcy is a failure that occurs in a company. Bankruptcy is the closing word for the cessation of the

entire operation of a company.(Mandagie et al., 2014) With the company's bankrupt status, it is only a matter of calculating the remaining ability to settle all of its debts, so that there is no longer any potential to get back up and continue its operations.

According to Rudianto (2013: 251) in general "bankruptcy is defined as a company's failure to carry out operations to achieve its goals". In the law, the term bankruptcy is identified with the condition of bankruptcy. According to Law Number 37 of 2004 concerning bankruptcy and postponement of payment of obligations, it is stated that bankruptcy is a situation where a situation is declared by a court decision if the debtor has two or more creditors and does not pay at least one debt that is due and can be collected.(Novita, 2018)

Financial distress is a liquidity problem that may lead to bankruptcy. The term bankruptcy focuses more on efforts to achieve the company's goals or economic aspects, namely in the form of the company's failure to achieve its goals (Widara 2010:39). According to Toto (2011: 332), bankruptcy is a condition where the company is no longer able to pay off its obligations. This condition usually does not just appear in the company, there are early indications of the company which can usually be recognized earlier if the financial statements are analyzed more carefully in a certain way.(Mandagie et al., 2014) Bankruptcy is a condition where the company is no longer able to settle all of its obligations, which begins with financial difficulties, liquidity difficulties which can be identified in the condition of the financial statements.

Method of Measuring Potential Bankruptcy
Altman Z-Score

Theory One of the most widely used studies on bankruptcy prediction is the Multiple Discriminant Analysis conducted by Edward I. Altman. Altman utilizes financial ratios, namely; a) Ratio of Working Capital to Total Assets, b) Retained Earnings to Total Assets, c) Income Before Tax and Interest to Total Assets, d) Market Value of Equity to Book Value of Debt, and e) Ratio of Sales to Total Assets. This model is formulated by combining financial ratios so that it can be used in all types of companies.

Mathematically the Altman Z-Score equation can be formulated as follows:

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

Description:

X_1 = Working Capital to Total Assets

X_2 = Retained Earnings to Total Assets

X_3 = Income before Tax and Interest to Total Assets

X_4 = Market Value of Equity to Book Value of Debt

X_5 = Sales to Total Assets.(Mandagie et al., 2014)

Springate Theory

This model was developed in 1978 by Gorgon L.V. Springate. The Springate model is a ratio model that uses multiple discriminatory analysis (MDA). In the MDA method, it takes more than one financial ratio related to the bankruptcy of the company to form a good model. This model is the same as the Altman model by utilizing financial ratios but this model only uses four ratios. The ratios used are; a) Working capital to total assets; b) income before interest and taxes on total assets; c) income before tax against current liabilities; and d) sales of total assets. The Springate models are:

$$S = 1.03A + 3.07B + 0.66C + 0.4D$$

Description:

A = Working Capital / Total Assets

B = Income before Interest and Tax / Total Assets
C = Income before Tax / Current Liabilities
D = Sales / Total Assets(Mandagie et al., 2014)

Zmijewski's theory

Research conducted by Zmijewski used a non-random sample with the population of the companies studied covering all companies listed on the American and New York Stock Exchanges during the period 1972-1978 with a population ranging from 2082-2241 per year. Each company was identified as bankrupt or not, using three sources, namely the Capital Changes Reporter, the Wall Street Journal Index, and the Compustat Research File. This model is also the same as the previous model, which uses financial ratios, but the Zmijewski model only uses three ratios, namely; a) the ratio of net income to total assets (ROA); b) Ratio of total debt to total assets (Debt ratio); and c) the ratio of current assets to current liabilities. The equation model used is a model from the results of research conducted by Zmijewski on companies listed on the stock exchange with a non-random sample so that the following equation is obtained:

$$X = -4.3 - 4.5X_1 + 5{,}7X_2 - 0.004X_3$$

Description:
X = overall index.
X1 = Ratio of Net Profit to Total Assets (ROA).
X2 = Ratio of Total Debt to Total Assets (Debt Ratio).
X3 = Ratio of Current Assets to Current Debt (Current Ratio).(Mandagie et al., 2014)

IN05 Index Model

This model was proposed by Neumaier (2005), this model is a model that is able to assess whether a company creates value for its owners (Karas & Reznakova, 2015). The IN05 index model was first developed in 1991, known as the IN91 index. Neumaier modified his bankruptcy prediction model in 1999, known as the IN99 index. In 2001 this model was modified again and known as the IN01 Index. The last modification was in 2005 and this model is known as the IN05 index. This model also utilizes financial ratios by utilizing five ratios, namely; a) total assets to total liabilities; b) EBIT to interest; c) EBIT to total assets, d) income to total assets, and e) current assets to current liabilities. The results of the study resulted in the IN05 formula, namely:

$$IN05 = 0{,}13\ X_1 + 0.04\ X_2 + 3{,}97\ X_3 + 0{,}21\ X_4 + 0{,}09\ X_5.$$

Description:
 X1 = total assets/total liabilities
 X2 = EBIT/interest
 X3 = EBIT/total assets
 X4 = income/total assets, and
 X5 = current assets/current liabilities.

Companies that have an IN05 value =< 0.9 are in the bankrupt category, between 0.9-1.6 are in the gray area category, and an IN05 value >= 1.6 then the company is declared healthy or not bankrupt (Karas & Reznakova, 2015).(Novita, 2018)

Ohlson models

James Ohlson proposed a bankruptcy analysis model which was carried out in his research in 1980. In Ohlson's research in 1970–1976, with a sample of 105 bankrupt companies and 2,058 companies that were not bankrupt. For the first time, apply the conditional logit model to a default

prediction study. The practical benefits of logit methodologies are that they do not require the assumption of MDA restrictions and allow working with disproportionate samples. After Ohlson, most of the academic literature uses the logit model to predict default (Plihal et al, 2018). Ohlson uses logistic regression in his analysis model because Ohlson tries to overcome the weaknesses of using the MDA (Multiple Discriminant Analysis) model. MDA is the most popular analytical technique for bankruptcy studies, but according to Ohlson MDA has problems such as certain statistical requirements imposed on the predictor distribution section (Utama, 2018). Ohlson selected nine independent variables which he thought should help in predicting bankruptcy, but provided no theoretical justification for the selection (Jouzbarkand et al, 2012). The model proposed by Ohlson has 9 financial ratio variables, namely:

$$\textbf{O Score} = -1{,}32 - 0{,}407X1 + 6{,}03X2 - 1{,}43X3 + 0{,}0757X4 - 2{,}37X5 - 1{,}83X6 + 0{,}285X7 - 1{,}72X8 - 0{,}521X9$$

Description :
X1 :   Log (total assets/GNP price level index)
X2 :   Total debt/total assets
X3 :   Working capital/total assets
X4 :   Current debt/current assets
X5 :   1 if total debt > total assets, 0 if total debt < total assets.
X6 :   Net profit/total assets
X7 :   Operating cash flow/total debt
X8 :   1 if net income is negative (-) for the last 2 years, 0 if net income is positive (+) for the last 2 years
X9 :   (annual net income – 1st-year net income)/(annual net income + 1st-year net income).(Widiasmara & Rahayu, 2019)

Taffler models

      Taffler (1983) formulated a bankruptcy prediction model for manufacturing firms quoted on the London Stock Exchange for the period 1969–1976. There are 4 variables used in this study and Taffler uses MDA analysis techniques with prediction accuracy of 95.7% for bankrupt companies and 100% for non-bankrupt companies (Sayari, 2017).

$$\textbf{ZTaffler} = 3{,}20 + 12{,}18X1 + 2{,}50X2 - 10{,}68X3 + 0{,}0289X4$$

Description :
X1 : Profit before tax/current liabilities
X2 : Current Assets/Total Liabilities
X3 : Current Liabilities/Total Assets
X4 : Net profit after tax/total assets

      If the Taffler value is negative, the company is at risk of bankruptcy, while if the Taffler value is positive, the company is not at risk of bankruptcy. In this Taffler model, if the Taffler value is > 0.3, the risk of bankruptcy is low, if the Taffler value is < 0.2, the risk of bankruptcy is high (Perwira, 2016). (Widiasmara & Rahayu, 2019) The results of research conducted by Ria Effendi on issuers of transportation services show that five methods are used and in general have different calculation results, of the five methods the most accurate in determining bankruptcy predictions is the Springate method.(Effendi, 2018) According to the research results of Christoforus Adhitya Sondakh et al. in the retail trading industry listed on the IDX for the period 2009-2013 using three methods found that all three gave different results, but the most accurate was the Springate method.(Mandagie et al., 2014) According to research conducted by Lintang Kurniawati and Nur Kholis on Shari banking companies in Indonesia using the Grover G-Score, Springate S-score, and Altman Z-Score methods found that

these three methods can be used to predict the potential for bankruptcy of sharia banking companies in Indonesia. Indonesia. And the most accurate that can be used is the Grover G-Score model.(Kurniawati & Kholis, 2016)

Meanwhile, research conducted by Diana Novita on manufacturing companies listed on the Indonesia Stock Exchange in 2011-2015 using the Altman Z-Score, Bankruptcy Index and IN05 Index found that there were differences generated by the three models, while those with a high level of accuracy is the Altman Z-Score model. Based on the results of the research above, it can be concluded that for transportation service companies the most accurate method that can be used to predict potential bankruptcy is the Springate model, as well as for retail companies. And for manufacturing companies the most accurate model is the Altman Z-Score model. Meanwhile, for Sharia banking, the most accurate is the Grover G-score model.(Novita, 2018)

RESEARCH METHODOLOGY

This study uses a descriptive qualitative method with a literature approach. By using a sample of existing research results that can be accessed freely via the internet and discusses the prediction of potential bankruptcy used for Sharia banking.

The source of data used in this study is secondary data, from the data that has been presented previously. The data collection technique used is literature. The data analysis technique used is descriptive qualitative. Describes the methods that can be used in measuring bankruptcy in sharia banking.

RESEARCH RESULTS AND DISCUSSION

Based on the results of research conducted by Lintang Kurniawati and Nurkholis using the Altman Z-Score, Grover G-score and Springate S-score models in sharia banking in Indonesia in 2010-2014 revealed that the most accurate model that can be used is the Grover G-Score model. to predict potential bankruptcy. The research was conducted on 11 sharia banking companies in Indonesia. Lintang revealed that the Grover G-Score has an accuracy rate of 96.36%, because Grover's model is only based on one component of the liquidity ratio and two profitability ratios.(Kurniawati & Kholis, 2016)

Research conducted by Aminah and Andi Sanjaya on banking companies in Indonesia for the period 2001-2012 revealed that the Altman Z-Score method is appropriate for use in banking companies that have gone public in Indonesia.(Fadilla, 2019) And according to Muhlis who conducted research on BRI Syariah Bank in 2014-2016 using the Altman Z-Score model found that BRI Syariah was free from the potential for bankruptcy.(Muhlis, 2018)

Nita Sari in the results of her research on bankruptcy prediction using the Grover and Ohlson model at Islamic commercial banks in Indonesia for the 2011-2019 period revealed that both models can be used in Sharia banking.(Ekonomi et al., 2021) The results of this study not only reveal the ability of the Grover and Ohlson model in predicting the potential for bankruptcy of Islamic commercial banks but also reveal that the model is in accordance with Islamic Sharia. Meanwhile, according to the findings of Diyah and Agung in a study entitled Comparative Analysis of the Altman model, the Springate model and the Zwijewski model in predicting the bankruptcy of Sharia banks in Indonesia, it was revealed that the Springate S-score model was more accurate.(Hariyani & Sujianto, 2018) Luluk Afiqoh and Nisful Laila found that the variables Capital Adequacy Ratio, Financing to Deposit Ratio, Leverage, Bank Size, Loan to Asset Ratio and Return on Assets had a significant effect on the Altman Z-Score value as a measure of bankruptcy risk in Islamic commercial banks in Indonesia.(Afiqoh & Laila, 2018) Luluk and Nisful tried to identify the impact of financial ratios on the effectiveness of measuring potential bankruptcy with the Altman Z-Score method.

Imam Asyrofi in his research entitled Analysis of Sharia bank bankruptcy risk using the Altman Z-Score, Spigate and Zmijewski X-Score methods for the period 2014-2018, revealed that the three methods showed different results. However, the final conclusion shows the same results regarding the recommendations of banks that have the potential to go bankrupt.(Imam Asyrofi, 2019) Based on the results of existing research proves that all these measurement methods can also be used to measure the

potential for bankruptcy in sharia banking. However, if we study in more detail about all of these methods without any modification, all of them cannot be used directly on Sharia banking. This happens because the elements that make up all these models are based on Interest and Taxes, which in the Sharia concept of interest is something that is forbidden. Likewise, in the case of taxes, which are known in the Sharia concept, they are only substitute fees for non-Muslim citizens.

In other conditions, the model can be applied to Shariah banking after modifications and adjustments are made in accordance with the structure of the financial statements of Sharia banking. If interest can be replaced with profit-sharing ratio and taxes can be replaced with zakat, then all of these models can be applied to Shariah banking. These models, after being modified in accordance with Sharia principles, can also be used to measure the potential for bankruptcy of Sharia banking. Meanwhile, based on the results of research in Indonesia that were collected, most of them used the Altman Z-Score in measuring the potential for bankruptcy of Sharia banking. As done by Endah Triwahyuningtyas and Ismail using the modified Altman Z-Score method. Likewise, research conducted by Raditya Prawita Jati and Ari Prasetyo also uses the Altman Z-Score method. Padilah research at Mandiri Syariah banks also uses the Altman Z-Score model by utilizing 2014-2017 data. Shafina Putri Kartika also in her research results using a modified Altman Z-Score. Research conducted by Luluk Afiqoh and Nisful Laila also uses the Altman Z-Score method. The others were Imam Pirman Hidayat and Irman Firmansyah, Muhammad Ilham, Zulfikar Hadad, Muhlis, Aminah and Andi Sanjaya, and many others who all used the modified Altman Z-Score method.

For research that does comparisons, not many do. However, for the selection of models that can be used for Sharia banking based on the results of research conducted by Nita Sari using the Ohslon and Grover model, it is revealed that both can be used in sharia banking in Indonesia. Meanwhile, Diyah and Agung in their research using the Altman, Springate, and Zwijewnki models also revealed that the three models can be used and the most accurate in predicting potential bankruptcy is the Springate S-score model. The results of Diyah and Agung's research are in line with the findings of Imam Asyrofi's research using the same method, revealing that the Altman Z-Score, Springate, and Zwijewski methods give different results but the final conclusion is the same in the recommendations of banks that have the potential to go bankrupt. The results of the discussion reveal that basically all of these models can be used in detecting potential bankruptcy in Sharia banking. However, the most widely used by researchers is the modified Altman Z-Score model. Only Diyah and Agung were able to reveal that the Springate S-score Model was the most effective in revealing the potential for bankruptcy of Sharia banking in Indonesia.

CLOSING

Based on the results of a review of the background, problem formulation, theoretical review and the results of the discussions that have been carried out using the library approach, it can be concluded that; 1) All of the potential bankruptcy detection models can be applied to Sharia banking after modifying the model in accordance with Sharia principles. 2) The most widely used model is the Altman Z-Score model and the most effective predictor of potential bankruptcy is the Springste S-score model.
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