Financial Ratio Analysis as a Prediction Tool of Bankruptcy on Banking Companies Listed in Indonesia Stock Exchange

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Abstract
This study aims to analyze the financial ratios of banks to predict bank bankruptcy in Indonesia. Variables used by a number of seven bank financial ratios are CAR, LDR, NPL, BOPO, ROA, ROE and NIM. The research data is obtained by census which means the whole population is used in the research which is 40 banks in year 2017. The analysis tool used is logit regression. The results of the multivariate test showed that the LDR variable had a significant effect on the profitability of bankruptcy of banks in Indonesia at α> 5% but did not have the same sign as predicted. CAR, NPL, BOPO, ROE, and NIM variables have the same mark as the predicted but not significant. The ROA variable is not significant and has a different sign than predicted. In general, the results do not accept all Ha.

Keywords: bank, bankruptcy, bank financial ratio, bankruptcy.

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Introduction
Various financial institutions grow as the economy grows. One of the financial institutions that seem to have the most important role in economy is banking financial institution, which are commonly referred as bank. Bank is a kind of financial institution in which companies, government and private institutions, as well as individuals save their funds. Through providing loan and various services, banks serve financial needs and launch payment system mechanism for all economic sectors.

Banking plays an important role in people's lives. Banking is a company in which its activities directly deal with the society. Banking activities are much influenced by the trust from its customers or community. If there is disturbance within the institution, there will be strong reaction from the people.

During the economic crisis which began with the liquidation of sixteen banks in November 1997 and later on 13 March 1999 as thirty eight other banks were declared to be failed to continue their activities. There are two types of distress, namely economic distress and financial distress. Economic distress of a company is associated with an imbalance between revenue and expenditure. Economic distress can be also caused by the company's capital costs which are higher than the profit rate on historical cost of investment. Meanwhile, a company is categorized as financially distressed if the company is unable to pay its due date liabilities although the total assets exceed its liabilities.

| Year | CAR 2015 | CAR 2016 | CAR 2017 | CAR 2018 | CAR 2017 | CAR 2018 |
|------|----------|----------|----------|----------|----------|----------|
| 2015 | 10.82    | 11.07    | 12.07    | 12.84    | 13.28    | 13.68    |
| 2016 | 11.02    | 11.64    | 12.64    | 13.34    | 13.84    | 14.24    |
| 2017 | 12.02    | 12.64    | 13.64    | 14.34    | 14.84    | 15.24    |
| 2018 | 13.02    | 13.64    | 14.64    | 15.34    | 15.84    | 16.24    |

Source: Statistik Perbankan Indonesia Vol 16 No12, Nov 2018, www.ojk.go.id

From the table above it can be seen that the Bank's performance in November 2018 CAR (23.32%), Core Capital ratio to ATMR (21.59%), ROA (2.52%), Operating Expense / Operating Income (78.03%), NIM (5.12%), LDR (93.19%), Liquid Asset Ratio (15.58%).
Bankruptcy may be triggered by various factors, both directly and indirectly. Banks can go bankrupt and must be closed if their performance is poor due to high numbers of non-performing loans or assets. Moreover, bank had liquidity problems due to massive withdrawals at one time since systemic crisis, bank run, and public distrust of the bank. Liquidity problems can also be caused by a mismatch of short-term funding structures.

Company’s performance can be measured by using financial statements. The bank's financial statements consist of balance sheet provide information about financial position, income statement to assess the bank's operational development, statement of cash flows that provide information on cash turnover. Financial statement not only reflects the condition of a company in the past but it can also be used to predict the financial condition of a company in the future (Pankof and Virgil in Suharman, 2007). Nurhayati (2013) said that company's high value indicated high prosperity that every company wants to achieve.

One of the techniques used to assess companies is financial ratio analysis. Indicators of bank’s performance can be viewed from liquidity, profitability, bank risk, capital ratio and business efficiency ratio. Liquidity ratio assesses the company's ability to meet short-term liabilities. Profitability ratio assesses the company's ability to make profit. Business risk ratio assesses the risks in running a business. Capital ratio measures the ability of capital to cover losses. Business efficiency ratio measures the level of efficiency of the company. The financial ratio is expected to be used to detect financial distress.

The bankruptcy prediction model is used as a means of early warning of financial distress, that is, it can improve conditions before reaching a crisis or bankruptcy condition (Endri, 2009).

**Literature Review**

**Financial Statement**

The final result of financial records is financial statements. Financial statements are reflection of management's achievements in particular period. By analyzing the financial statements of a company, the management's performance can be identified during particular period of time. However, financial statements is not the only aspect to reflect the actual achievements.

The most important role of financial statements in management is as accountability of report. The report is written in the form of financial statements to present the financial position and results in a certain period based on the accounting principles.

Fraser and Ailen Orminston (2004: 1-2) explained that financial statements are the fundamental to understand financial position of a company, to assess past performance and to predict financial performance in the future. He added that financial statements has the ability to clearly present the financial health of a company to make informative business decisions".

It can be concluded that financial statements generally consist of balance sheet and also profit and loss statements, but in fact, some additional reports are often used to support financial statements and provide further explanations such as capital statement, statement of cash flows, and others.

**Bank Liquidity Theories**

There are four renowned banking liquidity theories (Veitzhal, 2007: 387):

a. **Commercial Loan theory**

It is considered to be the oldest theory; it is also known as the doctrine real bills. This theory began about two centuries ago. The study of this theory was conducted by Adam Smith in his famous book The Wealth of Nations, published in 1776. This theory assumes that banks can only provide loans with self-liquidating short-term commercial loans. Self-liquidating means the loan is used for repayment.

b. **Shiftability Theory**

This theory is based on the proposition that the assets of the banks are either to be sold to other lenders or investors or shifted to central bank which stands ready to purchase assets offered for sale.

If the depositors decide to withdraw their money, the bank will only sell the investment, take what is obtained (or purchased), and repay to the depositor.

c. **Anticipated Income Theory**

In 1940 this theory was prominent in the United States; it is also known as the anticipated income theory. It means all funds allocated or every effort allocating funds is shown in a feasible sector that will be beneficial for the bank.

d. **The Liability Management Theory**

In liability management theory, banks should manage their liabilities properly to be a source of liquidity. The required liquidity for banks is:

1) Deal with withdrawals
2) Fulfill bank's obligations
3) Provide loans
Bankruptcy
The terms used in this study is to identify some banking problems such as bankruptcy (Altman, 1968; Ohlson, 1980; Barniv et al., 2002); bank failure (Meyer and Pifer, 1970), bank problems (Sinkey, 1975; Santoso, 1996), financial distress (Platt and Platt, 2002). Banks that failed in businesses have one or both of the following two criteria:

Firstly, the bank needs financial support and or management support from the government in running its operations.

Secondly, based on the level of bank financial health it is categorized as less healthy and unhealthy (Santoso in Suharman, 2007). Foster (1986) used the term financial distress to show severe liquidity problems that cannot be solved without a large scaling of corporate operations or structures.

At some points, financial distress is the best view as a whole economic idea/thought. Empirical research about this subject area has objective criteria for categorizing companies. Bankruptcy is a criterion used in many studies. This is a legal event that can be affected by the actions of bankers or other creditors. Even if the presumption of financial distress is binary, it is not necessary to be one-to-one categories between non-distressed/distressed and non-bankrupt/bankrupt.

According to Farid and Siswanto (in Januarti, 2002), in determining the bankruptcy model through financial analysis, classification of error can be classified into two:

- **Type I error**
  This type of error occurs when there is a prediction that the company is not bankrupt, but it turns out to be bankrupt.

- **Type II error**
  This type of error occurs when there is a prediction that the company is bankrupt, but it turns out to be not bankrupt.

**Indicators of Financial Distress or Bankruptcy**
According to Foster (1986), there are some indicators or sources of information about financial failure or bankruptcy:

a) Current and future cash flows analysis to directly focus on the alleged bankruptcy for the concerned period. Cash flows estimation in this analysis is critical variables as the assumptions that underlie budgeting.

b) Company strategy analysis considers potential competitors of the company or institution, relative cost structure, building expansion in the industry, company’s ability to continue increasing costs, management quality, and so on. In this theory, such consideration will also underlie cash flow analysis. However a separate focus on the problem of strategy can highlight the consequences of sudden changes in an industry, for example: BEP testing and cost structure.

c) Company financial statements with company comparisons analysis focused on single financial variables (univariate analysis) or a combination of financial variables (multivariate analysis) with external variables such as return securities or bond ratings.

**Research Hypothesis**
Based on the previous studies, CAR, LDR, NPL, BOPO, ROA, ROE, and NIM have influence on probability of bank financial distress in Indonesia. Therefore, the hypotheses of this research are as follow:

a. \( H_{a1} = \) CAR have negative influence on probability of bank financial distress in Indonesia
b. \( H_{a2} = \) LDR have positive influence on probability of bank financial distress in Indonesia
c. \( H_{a3} = \) NPL have positive influence on probability of bank financial distress in Indonesia
d. \( H_{a4} = \) BOPO have positive influence on probability of bank financial distress in Indonesia
e. \( H_{a5} = \) ROA have negative influence on probability of bank financial distress in Indonesia
f. \( H_{a6} = \) ROE have negative influence on probability of bank financial distress in Indonesia
g. \( H_{a7} = \) NIM have negative influence on probability of bank financial distress in Indonesia
Research Method

The population in this research is 40 banking companies listed in Indonesia Stock Exchange during 2017. The prediction model of the next following year tends to be more accurate (Suharman, 2007). The sample was obtained through census in which the population used as the data. Census is applied to obtain real value (Supranto, 2003).

The data is in the form of annual financial statements. The variables in this research were classified into two; they are dependent variable and independent variable as shown in Table 4.1:

The object of this research is banking companies listed in Indonesia Stock Exchange during 2017 by using CAR, NPL, LDR, BOPO, ROA, ROE and NIM ratios for predicting bankruptcy in banking business.
Findings and Discussion

Data Description

In this research, statistical description is needed to analyze the data. The statistical description of the data for the year of 2017 is presented in Table 5.1.

| Descriptive Statistics | N  | Minimum | Maximum | Sum     | Mean    | Std. Deviation |
|------------------------|----|---------|---------|---------|---------|----------------|
| CAR                    | 40 | 11.43   | 23.72   | 546.74  | 16.5679 | 3.10312        |
| NPL                    | 40 | .10     | 3.61    | 38.50   | 1.1667  | .94769         |
| LDR                    | 40 | 56.86   | 113.15  | 2,825.06| 85.6079 | 10.99950       |
| BOPO                   | 40 | 55.35   | 184.90  | 2,654.26| 80.4321 | 22.45233       |
| ROA                    | 40 | -7.64   | 4.46    | 55.17   | 1.6718  | 2.00161        |
| ROE                    | 40 | -10.99  | 35.18   | 534.80  | 16.2061 | 9.56676        |
| NIM                    | 40 | 2.13    | 11.95   | 171.05  | 5.1833  | 2.27322        |

Source: Processed secondary data
CAR variable has minimum value 11.43% and maximum value 23.72%. Meanwhile, the mean value 16.57% indicates the banks have high CAR value.

NPL variable has minimum value 0.10% and maximum value 3.61%. The mean value 1.17% indicates the banks are capable to provide loans selectively.

LDR variable has minimum value 56.86% and maximum value 113.15%. The minimum value indicates some of the banks are incapable to provide loans, whereas the maximum value indicates the banks are quite capable to market the funds. Meanwhile, the mean value 85.61% indicates the banks are liquid (less than 120%).

BOPO variable has minimum value BOPO 55.35% and maximum value 184.90%. The mean value 80.43% indicate the average banks have good efficiency rate (less than 94%) while the others need to perform efficiency.

ROA variable has minimum value -7.64%, maximum value 4.46% and mean value 1.68%. Negative ROA value indicates some of the banks experienced loss. Nevertheless, the average banks gain high profit in which the value is 1.68% (higher than 1.25%).

ROE variable has minimum value -10.99%, maximum value 35.18%, and mean value 16.21%. Negative ROE value indicates some of the banks experienced loss. However, the average banks gain high profit that can be seen from the mean value 16.21%.

NIM variable has minimum value 2.13%, maximum value 11.95%, and mean value 5.18% which indicate the average banks has high rate of Net Interest Margin (the mean value is higher than 2%).

The table shows that the hypothesis model describe the input data from -2 Log Likelihood Block Number, Cox& Snell R Square, Nagelkerke R Square, and also Hosmer and Lemeshow Test. Fit Model can be assessed from the statistical value -2 LogL without variable, only the constant value 42.015. After a new variable is added, the value -2 LogL decreased to 21.647 or 20.368 drops. In other words, the discrepancy of -2 LogL is significant. It means that the addition of independent variable would improve the fit model.

Meanwhile, the value of Cox Snell’s R Square is 0.347 and Nagelkerke R² is 0.606 means that dependent variable variability can be defined by 60.6% of independent variable.

Hosmer and Lemeshow’s Test are applied to test the 0 hypothesis that the empirical data is proper and fit to the model (no differences between model and data). The statistic value of Hosmer and Lemeshow’s Goodness Fit Test is 5.446 with significant probability 0.709 (above 0.05). Therefore, the model is accepted.

The logit test result for 2017 can be seen in the following table:

CONCLUSIONS
This study aims to examine and analyze the significant effect of CAR, LDR, NPL, BOPO, ROA, ROE, and NIM financial ratios on bank bankruptcy. The data used in this study are data of banking companies that are known as the Indonesia Indonesia Securities in 2017. The total population of 40 banks can be used in this study. Hypothesis testing uses multivariate test with logit regression. The results of the study did not accept Ha overall.

The variable that is influential in explaining bank bankruptcy is the LDR. In accordance with the results of the logit test, it can be concluded that bank bankruptcy is caused by the ability to market funds not maximally so
that banks invest funds collected in the form of other productive assets that are not at risk.

Based on the conclusions above, a number of suggestions are expected to be useful for the company and for other parties:

1) The negative effect of LDR on the probability of bankruptcy of a bank shows that the function of banks in lending has not gone well so that an idle fund occurs that can affect bank bankruptcy. To maintain liquidity at the same time so that the bank does not experience bankruptcy, management can plan the marketing of bank service products and place idle funds in the form of productive assets other than credit.

2) Further research should extend the research period and consider factors other than financial ratios, such as size, compliance aspects such as percentage violations of the Lending Limit, percentage exceeding the Maximum Lending Limit, Minimum Statutory Reserves and Net Open Position.

3) The negative influence of the LDR on the probability of bankruptcy of the bank shows that the bank's function in channeling credit has not gone well so that there is an idle fund that can affect the bank's bankruptcy. To maintain liquidity at the same time so that the bank does not experience bankruptcy, management can plan the marketing of bank service products and place idle funds in the form of productive assets other than credit.

4) Further research should extend the research period and consider factors other than financial ratios, such as size, compliance aspects such as percentage violations of the Lending Limit, percentage exceeding the Maximum Lending Limit, Minimum Statutory Reserves and Net Open Position.

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