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ANALYSIS OF MODEL-BASED PREDICTION OF BANK BANKRUPTCY IN THE BANKING COMPANIES LISTED IN INDONESIA STOCK EXCHANGE 2008-2012

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ABSTRACT

The purpose of this study is to determine the variables that affect the level of health of the company by Grover Model, Altman Model, Springate Model, Ohlson Model, and Zmijewzki Model to predict the health of the bank. The data used is a banking company in the period 2008-2012.This study uses regression, the variables derived from models of bankruptcy. This study uses the Capital Adequacy Ratio (CAR) as a measure of the level of health of banks.
Results of the study is the first, working capital is a measure of the company's operational capability has positive influence on the health of banks in all models of bankruptcy, except in the model of Altman (1973). Second, other variables that affect the health of banks is earnings before interest and taxes, net income, retained earnings, current ratio, working capital divided by current liabilities with models of different bankruptcy.

Keywords: models bankruptcy, health of banks model, working capital, earnings

Introduction

A Company, in general business, is actively to achieve a goal. The goal is to get benefit and to survive as well. This concept is referred to as a going concern. This information can be seen from the financial statements presented by management. The purpose of financial statements is to provide information regarding the financial position, performance, and changes in financial position of an entity that is useful to users in making economic decisions. The preparation of financial statements, management makes judgments about the entity's ability to maintain business continuity (IAI, 2012).

The financial statements provide information about what has been done in other words management shows the management accountability for the resources entrusted to it. Users can use these reports to make economic decisions in accordance with the interests of each party (IAI, 2012). One of the information contained in the financial statements after the analysis is financial ratio information. The purpose of financial ratio analysis is to compare the relationship of risk and return of a company that has a different size or in other words, financial ratios can be used to assess the performance of the company (White et al, 2003).

The company aims to generate profits, growing, and healthy, in fact, not necessarily the company is in good health, so it needs to be analyzed. Is the company making a profit and grow in a healthy state (Indarwati, 2010). The company always make a profit, also has a level of good health in order to continue to survive in the business. There are companies that have a good level of financial health, on the other side there are companies that exist on experiencing financial difficulties or experiencing financial distress.

The level of bank health are things that need attention. This is because banking is a business entity which collects funds from the public in the form of savings and channeling to the community in the form of credit. Therefore, the interest rate is very influential there are forms of credit in the form of interest income and interest expense. Previous research on bankruptcy prediction using financial statement data to predict the health of non-bank companies, are models of Altman (Prihanthini & Sari, 2013; Fatthudin, 2008; Adnan & Arisudana, 2013; Kartikawati, et al.2012), Springate (Prihanthini & Sari, 2013), Zmijewski (Prihanthini & Sari, 2013), Grover and Ohlson (Wang & Campbell, 2010).

Financial ratios published by the Indonesia Stock Exchange (IDX) and used that information to make investment decisions need to look at bankruptcy levels and health. Ratios are used both bankruptcy and health levels have in common is the ratio of profitability, solvency, and asset turnover. Models of non-bank corporate bankruptcies and bank soundness are not much done in previous studies. In this study the prediction of bank bankruptcy, then the bank's health conducted in accordance with the regulations issued by the Otoritas Jasa Keuangan (OJK). Based on the results of the model, this research will provide information variables that influence the health of banks.

Based on the background described above, there are several that affect the capital structure, which in turn will affect the level of health of the company, there are several issues to be analyzed in this study, Which variables affect the level of health of the

company by modeling Grover health prediction models, Altman Model, Springate Model, Ohlson Model, and Zmijewzki Model with banking data listed on the Stock Exchange in the period 2008-2012.

The purpose of the study was to determine the variables that affect the level of health of the company with predictive modeling Grover Model health, Altman Model, Springate Model, Ohlson Model, and Zmijewzki Model with the banking company data period 2008-2012.

Literature Review

Financial distress is the stage of the company before the company was facing bankruptcy stage. Stages of bankruptcy is not only financial but failed economic failure. Hence the need for a strategy of financial distress can recover quickly to the financial health of the company (Altman, 1968).

Financial difficulties can be seen from the company's inability to generate profits for two consecutive years, but it can be seen from the financial ratios. Financial ratios are frequently seen that the current ratio indicates a company's ability to meet its short term obligations (Almilia & Winny, 2005). Other financial ratios such as DER and DAR also used to see the company's ability to pay off its long-term liabilities in terms of assets and equity (Brigham & Houston, 2007). Some of the company's health prediction models done by several methods, namely Multiple Discriminant Analysis (MDA), logit, probit, recursive partitioning, hazard models, several research networks, including (EI & EH Altman, 2006; Beattie, Godacre, 2006; Almilia & Winny , 2005; Agustiono, 2004; Altman, 1993; Altman, 1983; Altman, Haldeman, 1977; Altman, 1968).

a. **Grover Model** is a model that is created by performing redesign and reassessment of the Altman Z-Score models. Grover Model did categorize bankruptcy with a score of less than or equal to -0.02 (Z≤-0.02) while the state does not go bankrupt more than or equal to 0.01 (Z≥0,01). This model according Prihanthini & Sari (2013) said that this model has very high accuracy 80% compared to the Springate Model, Zmijewski Model and models of Altman Z-Score to measure of bankruptcy in an ad Food Beverage company in Indonesia Stock Exchange.

b. **Altman Z-Score models (1968); Altman Z-Score models(1983)** model for private companies;**Altman Z-Score models (1993)** model for the company went public, and often referred. Altman model has a classification cut-off Z-scores, as follows:

Table 1. Zona Z-Score Altman

Zone	Model		
	Z (Altman, 1968)	Z' (Altman, 1983)	Z'' (Altman, 1993)
Safe	>2.99	>2.90	>2.60
Gray	1.80-2.99	1.23-2.90	1.10-2.60
Distress	<1.80	<1.23	<1.10

Source:Samarakoon & Hasan (2003)

Classification of financial difficulties using Z Score above financial ratios for the previous two years will greatly reduce the accuracy of the model Altman.

c. **The model Springate**,Springate Model classifies firms with Z-scores> 0,862, a company that is not potentially bankrupt, and vice versa if the company has a Z score <0.862, classified as a company that is not healthy and potentially bankrupt.

d. **Ohlson models using 9 independent variables.**

e. **Model Zmijewski**, the result of 20 years has been reviewed. This model uses a ratio measure of performance, leverage, and liquidity applied in companies are already bankrupt and the company can survive. Zmijewski models has exceeded predictions of 0 then the company could potentially bankrupt, otherwise if the company has a score of less than zero then the company is not potentially bankrupt.

Provisions of the Rating Conventional banks by the Otoritas Jasa Keuangan (OJK). Bank shall maintain and/ or improve the health level of bank by applying the precautionary principle and risk management in carrying out the activities required to make an assessment.Bank usinglevel approach to health risk (risk-Rating based Bank) both individually and on a consolidated basis. Banks are required to conduct self-assessment (self assessment) on the health level of bank at least every semester to the position of the end of June and December. Bank shall update the health level of bank by self assessment at any time if necessary (OJK, 2014).Assessment factors include the health level of bank (OJK, 2014). Profile of risk (risk profile), Good Corporate Governance (GCG), profitability (earnings), and Capital (capital).

Research Method

The population in this study is banking company that is listed on the Stock Exchange. The method used for sampling is purposive sampling method, which is a method of sampling using the specified criteria. Sampling criteria in this study are:

1. Banking company listed in Indonesia Stock Exchange in the period 2008-2012, and for the Altman model requires data from the period 2006 to 2012 because there are measurements that require stability profit financial statement data consistently for 3 years in a row.

2. The financial statements of the company are available on the period of observation

3. The financial statements ending December 31.

The following table is a process sampling for each model which will be tested the effect of each independent variable to form a model of the level of health of the banking company.Sources of data in this study is the banking company's annual financial statements for the period 2006-2012 were obtained from the IDX Investment Gallery UNIKA Soegijapranata Semarang. The data used are secondary data, ie data obtained indirectly through an intermediary medium (obtained and recorded by the other party).

Types of data required are financial statement information and stock prices. Income statement information that is needed is information sales, interest expense, earnings before interest and taxes, earnings before taxes, net income. For information that is presented in the balance sheet are required current assets, total assets, current liabilities, total debt, capital stock, and retained earnings. For market information is the data required at each end of the stock price during the periods of observation period and the number of shares outstanding.

Bank soundness is measured by the Capital Adequacy Ratio (CAR). CAR is a capital adequacy ratio that serves to accommodate the risk of loss that may be faced by the bank. The higher the value, the better the CAR of the bank's ability to fund operations and provide a substantial contribution to profitability. CAR is calculated by dividing its own capital with risk-weighted assets (ATMR). The calculation of ATMR considering the risks involved, namelyoperational risk, market risk, and credit risk. In this study, the CAR is presented in the notes to the financial statements.

The use of this ratio using Bank Indonesia Regulation No. 15/12 / PBI / 2013 on Capital Adequacy of Commercial Banks. In Article 2 paragraph 3 stated that banks are required to have minimum capital of 8%. Working capital the amount of funds used during the accounting period to generate short-term revenue. Working capital is measured by finding the difference between the current assets by current liabilities. This study calculated the working capital of the absolute value of working capital because the company used in this research is a banking company so most capital comes from debt.

Total assets are all rights owned by the company resulting from the transaction in the past. Total assets consist of short-term assets and long-term. Earnings before interest and taxes is the result of net income to cost of goods sold and all operating expenses and after recognition of all revenue and expenses outside of the business or before the imposition of the taxes and interest. Net income recognized company after all revenue and expenses are recognized, including the components of profit/ loss, and profit can be seen in the income statement on the last line. Profit on hold is accumulated over the life of the company's profit that is not distributed to the shareholders, or in other words the accumulated earnings retained by the company.

Market capitalization can also be said as the company's market value, which can be calculated by multiplying the number of shares outstanding by the stock market price. The market capitalization is calculated as at the end of the period that the stock price used is the price as of December 31. The book value of debt is the amount of debt that the company presented in the financial statements. Sales or earnings of the company are the result of efforts on the merit or the main activity of the company concerned. Sales or revenues are taken into account in this study is the net income.

Earnings stability showed variability profits throughout the period of observation, which is calculated using the standard deviation of profit companies throughout the period of observation. To control the size of the company, the profit in this study was measured by ROA. ROA is calculated by dividing net income by total assets. The period of observation in this study was 2 years before the period of observation and the observation, so that the stability of these earnings is the standard deviation of ROA for three consecutive periods. Payment of Interest is the amount of interest paid by the company during the accounting period. Current assets are an asset that has a high level of liquidity. They are included in current assets such as cash group, accounts receivable, inventory, and others. Current Debt is an obligation which is owned by the company that the maximum maturity for repayment of the accounting period or year whichever is shorter.

The model of this research study use model changes. At the beginning of the research model, the research will be divided into two stages, the first stage of the establishment of the model will be performedbyusing a variety of existing models; and the second will be the measurement of the level of persistence of the models to determine which model has the highest accuracy rate. Based on the existing data in this study in which the bank uses to measure the health of the CAR and CAR result that companies listed on the Stock Exchange has a limit on the minimum CAR of 8%, and there is only one company with a negative CAR in the period of observation, the in this study a research model changes.

The changes that occur are the research model based prediction models that exist, researchers conducted a regression analysis using the data listed banking companies during the period 2008-2012. Logsitik such as discriminant analysis and preliminary design of the study could not be done because of the company's health condition does not vary, or in other words mostly healthy, because there is only 1 data unhealthy during the observation period. Under these conditions the study design turned into investigating influence of variables into predictors of health conditions existing companies, namely the model of Grover, Altman, Springate, Ohlson, and Zmijewski.

Here are the variables forming predictive models that will be used for the regression analysis in this study:

1. Grover Model
   $$CAR = \alpha + \beta_1 X1 + \beta_2 X3 + \beta_3 ROA + \varepsilon$$
   where:
   CAR: Capital Adequacy Ratio
   X1:   working capital/ total assets
   X3:   earnings before interest and taxes/ total assets
   ROA: net income/ total assets
2. Altman Model (1968)
   $$CAR = \alpha + \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \beta_4 Z_4 + \beta_5 Z_5 + \varepsilon$$
   where:
   CAR: Capital Adequacy Ratio
   Z_1:   working capital / total assets
   Z_2:   retained earnings / total assets
   Z_3:   earnings before interest and taxes / total assets

Z_4:   market capitalization / book value of debt
Z_5:   sales / total assets

3.   Altman Model (1973)
     $CAR = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon$
     where:
     CAR: Capital Adequacy Ratio
     X1:   return on assets (Earnings before interest and taxes / total assets)
     X2:   stability of earnings (standard deviation of earnings for 3 years in a row)
     X3:   debt service (Earnings before interest and taxes / total interst payment)
     X4:   cumulative profitability (retained earnings / total assets)
     X5:   liquidity (current ratio)
     X6:   capitalization (capital share/ total capital)
     X7:   size (log from total asssets)

4.   Altman Revised Model (1998)
     $CAR = \alpha + \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \beta_4 Z_4 + \beta_5 Z_5 + \varepsilon$
     where:
     CAR: Capital Adequacy Ratio
     Z_1:   working capital / total assets
     Z_2:   retained earnings / total assets
     Z_3:   earnings before interest and taxes / total assets
     Z_4:   book value equity / total assets
     Z_5:   sales / total assets

5.   Springate Model
     $CAR = \alpha + \beta_1 A + \beta_2 B + \beta_3 C + \beta_4 D + \varepsilon$
     where:
     CAR: Capital Adequacy Ratio
     A: working capital/ total assets
     B: net profit before interest and taxes/ total assets
     C: net profit before taxes/ current liabilities
     D: sales / total assets

6.   Ohlson Model
     $CAR = \alpha + \beta_1 SIZE + \beta_2 TLTA + \beta_3 WCTA + \beta_4 CLCA + \beta_5 OENEG + \beta_6 NITA + \beta_7 FUTL + \beta_7 INTWO + \beta_7 CHIN + \varepsilon$
     Where:
     CAR: Capital Adequacy Ratio
     SIZE: log (total assets).
     TLTA: total liabilities / total assets.
     WCTA: working capital / total assets.
     CLCA: current liabilities / current assets.
     OENEG: is a dummy variable, 1 if total liabilities exceed total assets, and 0 if otherwise.
     NITA: net income / total assets
     FUTL: funds provided by operations / total liabilities
     INTWO: is a dummy variable, it would be worth 1 if negative net income for at least two years in a row, and
                             0 if not
     CHIN: $(NIt-NIt-1)/(\,|\,NIt\,|\,+\,|\,NIt-1\,|\,)$, where NIt is the net income for all periods.

7.   Zmijewski Model
     $CAR = \alpha + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \varepsilon$
     where :
     CAR: Capital Adequacy Ratio
     X1:   ROA (Return on Assets)
     X2:   Leverage (Debt Ratio)
     X3:   Liquidity(Current Ratio)

Results And Discussion

Table 2, present the mean of variables which include in each prodective model in this reseach.

Table 2. Mean of Variables in Descriptive Statistics

Variabel	Grover	Altman (1968)	Altman (1973)	Altman (1998)	Springate	Ohlson	Zmijewski
CAR	0.1607	0.1668	0.1572	0.1618	0.1607	0.1597	0.1619
WCTA[1]	1.5615	1.5757		1.5514	1.5615	1.5677	

EBIT[2]		0.0166		0.0082	0.0081		
ROA[3]	0.0045					0.0042	0.0046
RETA[4]		0.0141					
MCAP[5]		1.2514	0.9382				
SALES		0.0944		0.0950	0.0950		
DEBTS[6]			0.4325				
STBLB[7]			0.0162				
CR[8]						0.6978	
TLTA[12]						0.8978	
FUTL[14]						-0.3074	
INTWO[16]						0.01	
CHIN[17]						0.0475	
BVTA[18]				0.0922			
N	150	146	135	151	150	147	151

Explanation:
1) WCTA: working capital
2) EBIT: profit before tax and interest
3) ROA: Return on Asset
4) RETA: retained earnings divided by total assets
5) MCAP: market capitalization (stock price divided by the capitalization of total assets)
6) DEBTS: debt service
7) STBLB: stability of earnings
8) CR: current ratio (liquidity)
9) SIZE: size of the firm (log total aset)
10) EQL: book value of equity divided by book value of total debt
11) EBCL: profit before tax divided by current liabilities
12) TLTA: total debt divided by total assets
13) NITA: net income divided by total assets
14) FUTL: working capital divided by total debt
15) DTLTA: dummy condition of total debt divided by total assets (1 if total liabilities exceed total assets, and 0 if otherwise)
16) INTWO:is a dummy variable, it would be worth 1 if negative net income for at least two years in a row, and 0 if not
17) CHIN = (NIt-NIt-1)/($\mid$NIt$\mid$+$\mid$NIt-1$\mid$), where nit is net income for all periods.
18) BVTA : book value of equity to total assets

Grover Model

Grover Model predicts health level by using variable working capital, profit before tax and interest, as well as return on assets (ROA). This model has been tested and has free classical assumptions of multicollinearity, and heteroscedasticity,and normality of data. Grover results of regression models, working capital (WCTA) has mean 1.5615 that mean on average banking company has more current assets than their current liabilities. ROA has an average of 0.0045, which means that on average, the company earned net income of banking as much as 0.45 percent of the total assets owned by the company. CAR has an average of 16.07 percent. Value is quite high due to Bank Indonesia set a limit of CAR is 8 percent. This data can also be known that there is a bank that has a negative CAR values 22 percent, occurred on one company in one year of observation. Test variables that affect the health of the company with the model predictions Grover. The model is able to explain the soundness of banks amounted to 41.3 percent, or in other words the variability of the bank can be explained by the working capital information and ROA of 41.3 percent and the rest is explained by the variables that exist outside of the model.

Grover Model discriminant test to predict the company's health condition using three variables: working capital, earnings before taxes and interest, and net income. The third variable is controlled by means divided by total assets. Data on the Indonesian banking companies listed on the Stock Exchange for the period 2008 to 2012 there was a problem of multicollinearity which then resulted in variable profit before tax and interest were excluded from the model.

Table 3show the result of processing to analyze the influence of the variables included in the model Grover. The results of the two existing variables have a significance value of 0.000 with a positive direction so that it can be said that the working capital and net income has a positive effect on the level of capital adequacy of the banking company. Explanation of the results is that the company has sufficient working capital will be able to run its operations properly, so as to produce a good profit too, will eventually lead to its capital adequacy ratio was also good.

Altman Model (1968, 1973, and 1998)

Altman Model (1968) predicting the level of health using a variable working capital, retained earnings, earnings before taxes and interest, market capitalization, and sales. Classical assumption test results for models Altman (1968), variable market capitalization is measured by multiplying the closing price of the stock on December 31, the number of shares outstanding divided by the book value of equity. The value of the market capitalization of an average of 1.2514, which means that the magnitude of the market kapitaliasi 1.2514 times the book value of its equity. For variable sales of 0.0944, which means that the amount of sales by 9.44 percent of the total assets owned by the company. Average capital adequacy ratio of 16.68 percent, which means the average capital adequacy ratio of the banking company by 16.88 percent and this figure is above Bank Indonesia's regulation stipulates that a minimum CAR of banks 8 percent.

Table 3 in panel R square provide information, that this model is able to explain health of banks amounted to 26.3 percent; or in other words the variability the health of banks can be explained by the independent variables in the Altman model is 26.9 percent and the rest is explained by the variables that exist outside of the model. Altman model (1968) in a discriminant test to predict the company's health condition using three variables: working capital, retained earnings, earnings before taxes and interest, market capitalization, and sales. The results of these tests indicate that working capital, retained earnings, and earnings before tax and interest has a positive influence on the capital adequacy ratio; whereas for market capitalization and sales do not have an influence on the capital adequacy ratio. Possible explanation of this result is insignificant market capitalization measured in stock prices are heavily influenced by investor expectations, while the capital adequacy ratio of a company's internal condition. Possible explanation for the sales variables that can be given is still selling herein has still early for calculating the profits of a company.

Altman model (1973) in predicting health of banks using variable ROA, earnings stability, debt service, retained earnings, liquidity, market capitalization, and the size of the company. Table 2 shows that the average value of the stability of the profit is 0.016 means that on average there is a standard deviation of earnings for the three-year observation period amounted to 0.016. Standard deviation indicates the extent of deviation of net income divided by total assets (ROA) with an average ROA over the three-year observation period, so if the number is getting smaller standard deviation will indicate that there is a high profit stability or can be said that the profit of the company was not experiencing high fluctuations.

The amount of average debt service amounted to 0.4325. Debt service measured by earnings before interest and taxes aredivided by interest expense. On the average banking company in the period of observation has a profit of 43.25 percent of the interest cost into obligations. The average size of capitalization is 0.9382, which means that the average market capitalization amounted to 93.82 percent of the book value of equity; while the capital adequacy ratio has an average value of 0.157. This average indicates that the banking company in the period of observation is above the minimum limit set by Bank Indonesia at 8 percent.

Test influential variable in the model predictions with the model health companies Altman (1973), the results provide information that this model is able to explain the health level of bank by 7.6 percent, or in other words the variability health of banks can be explained by the independent variables in the model is equal to 7.6 percent and the rest is explained by the variables that exist outside of the model. Altman model (1973) in a discriminant test to predict the company's health condition using three variables: ROA, earnings stability, debt service, retained earnings, liquidity, capitalization, and firm size. After testing the assumptions of classical remaining variable income stability, debt service, and capitalization. The results of this test indicate that the market capitalization has a negative effect on health of banks at the level of 5 percent, debt service has a positive influence on health of banks at alpa on level 10 percent, whereas for the variable earnings stability does not have a significant influence on health of banks.

Altman model (1998) to predict the probability of the company's health condition using variable: working capital, retained earnings, earnings before taxes and interest, equity book value, and sales. All of these variables are divided by total assets is useful to control the size of the company. Table 2 shows that the average value of working capital of 1.551, which means that the average banking company in the period of observation has a working capital of 155.14 percent of the total value of their assets. Variable profit before tax and interest has an average value of 0.008, which means that on average, the banking company has earnings before interest and tax of 0.82 percent of total assets.

Book value of equity variables have an average value of 0.092, meaning on average, the magnitude of the company's equity book value by 9.22 percent of their assets, so that the assets acquired from the liabilities side. This is logical because the banks managing the deposit of public funds is so big inits obligations. The average sales figures obtained 0.0950 which means that the banking company's revenue by an average of 9.5 percent of total assets, while the capital adequacy ratio has an average value of 0.1618. This average indicates that the banking company in the period of observation is above the minimum limit set by Bank Indonesia at 8 percent. Test influential variable in the model predictions using the model of healthcare companies Altman (1998) obtained information that this model is able to explain health of banks by 41.8 percent, or in other words the variability health of banks explained by the independent variables by Altman model this by 41.80 percent and the rest is explained by the variables that exist outside of the model. Altman model (1998) to test the discriminant to predict the company's health condition using three variables: working capital, retained earnings, net profit before tax and interest, equity book value, and sales, and because of the multicolinearity problem is done dumping variables retained earnings.

Influence the test results presented in the table 3 and these results may explain the variable working capital and earnings before taxes and interest and a significant positive effect on health of banks as measured by the capital adequacy ratio. This occurs because the two variables determine the level of liquidity of the company, ultimately influential in the calculation of CAR. Variable equity value possible explanation of this is not influential variable CAR calculation using the data periodically, whereas the book value of equity is the cumulative data, especially for components of retained earnings which is an accumulation of profit over the founding of the company. Variable sales or income has no effect on health of banks is still a possibility because the income component in determining the initial profits of a company.

SpringateModel

Springate model predict the possibility of the company's health condition using variable working capital, earnings before interest and taxes, net income before tax, and sales. All of these variables are divided by total assets is useful to control the size of the company, unless the variable net income before taxes divided by current liabilities.

The data show that the average value of working capital of 1.5615, which means that the average banking company in the period of observation has a working capital of 156.15 percent of the total value of their assets. Variable profit before tax and interest has an average value of 0.008, which means that on average, the banking company has earnings before tax and interest at 0.81 percent to total assets.

The average sales figures obtained 0.095 which means that the banking company's revenue by an average of 9.5 percent of total assets; while the capital adequacy ratio has an average value of 0.1607. This average indicates that the banking company in the period of observation is above the minimum limit set by Bank Indonesia at 8 percent.Testing influential variable in the model predictions with the company health Springate models obtained using this model is able to explain the results health of banks amounted to 43.8 percent, or in other words the variability health of banks can be explained by the independent variables in the model this Springate of 43.8 per cent and the rest is explained by the variables that exist outside of the model.

Springate models in discriminant test to predict the company's health condition using five variables, namely working capital, earnings before interest and taxes, net income before tax, and sales, and because of multicolinearity problems then do exhaust variable profit before tax. Influence the test results presented in the table 3 and the result can be explained that the variable working capital and earnings before taxes and interest and a significant positive effect on health of banks as measured by the capital adequacy ratio. This is reasonable because the two variables determine the level of liquidity of the company that ultimately affect the calculation of CAR. Variable sales or income has no effect on health of banks is still a possibility because the income component in determining the initial profits of a company.

OhlsonModel

Ohlson model predict the possibility of the company's health condition using variable sized companies, working capital, current ratio, OENEG (dummy total debt divided by total assets), net income, FUTL (working capital divided by total debt), INTWO (if negative earnings dummy variable for at least 2 years in a row), and CHIN (profit divided by the total absolute change in profits over the two periods). All of these variables are divided by total assets is useful to control the size of the company, except for dummy variables.

Total debt divided by total assets has a 0.898 average, which means that the average company has a debt amounting to 89.78 percent of total assets. Average working capital amounted to 1.568, which means that the average company has a working capital of 156.77 percent of total assets. For variable current liabilities to current assets have an average of 0.698, which means that on average, the banking company has current liabilities amounted to 69.78 percent from its current assets.

Net income divided by total assets has an average of 0.0042, which means that on average in the period of observation banking company had a net profit of 0.42% of total assets. ; FUTL variable has an average of -0.3074 which means that the average working capital divided by total outstanding debt of -0.3074. CHIN variable (profit divided by the total absolute change in earnings for two periods) of 0.0475, which means that the change in profit of 4.75% of the total current profits and earnings prior period; while the capital adequacy ratio has an average value of 0.1597. This average indicates that the banking company in the period of observation is above the minimum limit set by Bank Indonesia at 8%. To test the effect of variables in the prediction model of healthcare companies to use models such as Ohlson obtained results provide information that this model is able to explain health of banks amounted to 0,499; or in other words the variability health of banks can be explained by the independent variables in this model of Ohlson of 49.9% and the rest is explained by the variables that exist outside of the model.

To test the effect of the variables in the model Ohlson against health of banks can be described to predict the company's health condition using five variables: the size of the company, working capital, current ratio, OENEG (dummy total debt divided by total assets), net income, FUTL (working capital divided with total debt), INTWO (if negative earnings dummy variable for at least 2 years in a row), and CHIN (profit divided by the total absolute change in profits over the two periods), and because of the heteroscedasticity problems carried disposal company size.Independent variables that have a positive influence on the health of the banking company level Ohlson model are working capital, liquidity (current assets divided by current liabilities, net income, and FUTL (working capital divided by total debt). This is because all of these variables affect the calculation of the capital adequacy ratio for the banking companies and the influence of these variables are positive, which means the higher the value of this variable, the fourth will result in higher capital adequacy ratio. Dummy variable conditions of total debt divided by total assets, INTWO, and CHIN in this study had no influence on health of banks in Indonesia for the period 2008-2012.

ZmijewskiModel

Zmijewski model in predicting the possibility of the company's health condition using variable ROA, leverage, and liquidity. ROA is measured as net income divided by total assets, leverage measured by total debt divided by total assets, and liquidity is calculated from current assets divided by current liabilities.

Table 2 shows that the average ROA banking company in the period of observation was 0.0046 which means that on average, the amount of net profit of 0.46 percent of the total assets owned by the company, while the capital adequacy ratio has an average value of 0,162. This average indicates that the banking company in the period of observation is above the minimum limit set by Bank Indonesia at 8 percent.

Zmijewski model obtained results provide information that this model is able to explain the soundness of the bank amounted to 0.326, or in other words the variability health of bank can be explained by the model of Zmijewski's ROA of 32.6 prsen and the rest is explained by the variables that exist outside of the model. To test the effect of the variables in the model Zmijewski against health of banks can be described to predict the company's health condition using three variables: ROA, leverage, and

liquidity, but because there is a problem of heteroscedasticity then performed the disposal of two independent variables, namely leverage and liquidity. ROA variable positive effect on the health of the banking company level as measured by the capital adequacy ratio.

This section will be presented briefly the variables used in each model and the results of testing the effect of these variables, as presented in Table 3.

Table 3. Variable Test Results - All Models

Variabel	Grover	Altman (1968)	Altman (1973)	Altman (1998)	Springate	Ohlson	Zmijewski
WCTA[1]	+ *)	+ *)		+ *)	+ *)	+ *)	X
EBIT[2]	X	+ *)	X	+ *)	+ *)		X
ROA[3]	+ *)						+ *)
RETA[4]		+ *)	X				
MCAP[5]		^^)	-*)))				
SALES		^^)		^^)	^^)		
DEBTS[6]			+ *))				
STBLB[7]			^^)				
CR[8]			X			+ *)	
SIZE[9]			X			X	
EQL[10]				^^)			
EBCL[11]					X		
TLTA[12]						X	
NITA[13]						+ *)	
FUTL[14]						+ *)	
DTLTA[15]						^^)	
INTWO[16]						^^)	
CHIN[17]						^^)	
Adj R² (R²)	0,413	0,263	0,076	0,418	0,438	0,499	(0,326)
F	53,398	11,662	4,650	27,926	39,674	21,744	71,918
Sig F	0,000	0,000	0,004	0,000	0,000	0,000	0,000
X	Multi-collinerity	Multi-Collinerity and Heteros-cedasticity	Multi-collinerity	Multi-collinerity	Multi-collinerity	Heteros-cedasticity	Heteros-cedasticity

Explanation:
1) WCTA: working capital
2) EBIT: profit before tax and interest
3) ROA: Return on Asset
4) RETA: retained earnings divided by total assets
5) MCAP: market capitalization (stock price divided by the capitalization of total assets)
6) DEBTS: debt service
7) STBLB: stability of earnings
8) CR: current ratio (liquidity)
9) SIZE: size of the firm (log total aset)
10) EQL: book value of equity divided by book value of total debt
11) EBCL: profit before tax divided by current liabilities
12) TLTA: total debt divided by total assets
13) NITA: net income divided by total assets
14) FUTL: working capital divided by total debt
15) DTLTA: dummy condition of total debt divided by total assets (1 if total liabilities exceed total assets, and 0 if otherwise)
16) INTWO:is a dummy variable, it would be worth 1 in negative net income for at least two years in a row, and 0 if not
17) CHIN = (NIt-NIt-1)/($|$NIt$|$+$|$NIt-1$|$), where nit is net income for all periods.

*) significant at the 1%
*)) significant at the 5%
*))) significant at the 10%
^^) not significant

X: deleted because it does not meet the assumptions of classical

Based on the summary table above, it can be concluded several variables that have an influence on health of banks. Variable working capital has positive effect on the performance of banks in all models, except the model of Altman (1973) because in the model does not use working capital. Working capital in this study is measured by comparing the absolute value of the current liabilities with current assets.Other variables that affect the health of banks is earnings before interest and taxes, net income, retained earnings, current ratio, working capital divided by current liabilities with models of different bankruptcy

Conclusion

Variable profit before tax and interest, net income, retained earnings, current ratio, working capital divided by current liabilities affect the 5 percent level. This is because the revenues generated from the banking sector through the credit sector. The more credits extended to customers the higher income. In addition, the ratios relating to banking has been defined BI, the CAR of at least 8%, which resulted in the availability of RWA (risk-weighted assets) of at least 8%. This rule results in the banking company is always seeking the presence of the primary backup, secondary, credit, long-term investments, fixed assets, and inventory. Primary backup derived from demand deposits, savings deposits, time deposits, long-term loans. Secondary reserve of savings deposits, time deposits, and capital. Credit to obtain funds from demand deposits, long-term loans, and capital. Long-term investment is derived from current accounts, savings, short-term loans, and capital. Fixed assets and inventory derived from the capital.

Implications And Limitation

Based on the previous discussion, there are several conclusions, namely that working capital is a measure of the company's operational capability has positive influence on health of banks in all models of bankruptcy, except in models of Altman (1973) because in the model does not use working capital. Other variables that affect whether the variable is not present in all models, the variable profit before tax and interest, net income, retained earnings, current ratio, working capital divided by current liabilities. Based on the above conclusions, the suggestions for subsequent research is to test the company's bankruptcy prediction using data from non-banking companies. Subsequent research could also extend to 10-20 year period of observation.

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APPENDIX

Appendix 1: General Sampling Process

explanation	2008	2009	2010	2011	2012	Total
banking company	28	29	31	31	32	151
The financial statements are not available	0	0	0	0	0	0
The financial statements don't December 31th	0	0	0	0	0	0
Number of Observations	28	29	31	31	32	151

Source: Secondary data that has been processed (2014)

Appendix 2:Composite ratings and Criteria

PK	criteria
PK-1	The condition is generally very healthy bank that is considered very capable mengahdapi influence business conditions and other external factors.
PK-2	Banks Generally healthy condition so assessed to face a significant negative effect if changes in business conditions and other external factors.
PK-3	Condition is generally quite healthy banks so considered quite able to deal with a significant negative effect of changes in business conditions and other external factors.
PK-4	Conditions are generally less healthy banks that were considered less able to deal with a significant negative effect of changes in business conditions and other external factors.
PK-5	The condition is generally not healthy banks that are considered not able to deal with the significant negative effect of changes in business conditions and other external factors.

Sources: OJK (2014)

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