

CHOOSING RATIO IN THE FINANCIAL DISTRESS PREDICTION MODEL

Nikke Yusnita Mahardini¹, Bandi²

Abstract

Purpose – This study aims to find a financial distress prediction model that is suitable for Indonesian companies.

Design/methodology/approach – The sample in this study amounted to 150 data. The research sample was grouped into financial distress and non-financial distress. Research data is sourced from the Indonesia Stock Exchange. Discriminant analysis is used to test data and generate financial distress prediction models for manufacturing companies in Indonesia.

Findings – Results show that the financial ratios that contribute to the financial distress prediction model are the ratios of profitability, liquidity, and efficiency.

Practical Implications – The resulting model can contribute and as a basis for the development of future studies on relevant, robust, and accurate corporate financial distress early warning systems that will help stakeholders to respond to potential bankruptcies accordingly and on time

Originality – Research on new models to predict corporate bankruptcy in Indonesia which is a developing country is still rare. Most of the literature still uses the Altman Z-Score model.

Keywords – financial distress, bankruptcy, financial ratio.

1. Introduction

The company's condition experiences dynamics over time. The company's ability to earn profits is not always accompanied by the ability to handle debt. Inability to compete can result in a decrease in profitability. Too much debt burden can cause companies to experience cash flow pressure (Prihadi, 2020). The fundamental nature of business activities involves risk-taking. Some companies are unable to avoid financial difficulties (Lubben and Narayanan, 2012).

¹ PhD Student, Economics Doctoral Program, Faculty of Economics and Business, Sebelas Maret University, Surakarta, Indonesia
Faculty of Economics and Business, Serang Raya University, Serang, Indonesia, nikkeyusnita.m@gmail.com

² Professor, Department of Accounting, Faculty of Economics and Business, Universitas Sebelas Maret, Surakarta, Indonesia, bandi@staff.uns.ac.id

Healthy or financially depressed conditions in a company are very important, not only for the sector in which the company operates but also for the financial system and the overall economy (Çolak, 2020). For lenders, a decrease in the ability to pay can result in a decrease in creditor income. In the worst form, creditors find some of the borrower's experience default. One analysis developed from the lending side is the prediction of financial distress. This analysis can help companies and investors at the time of making decisions in saving the company from bankruptcy (Prihadi, 2020; Çolak, 2020; Thai et al., 2014).

Platt and Platt (2002) found that financial distress is the stage of decline in the financial condition experienced by a company, which occurs before bankruptcy or liquidation. Corporate bankruptcy is characterized by a prolonged and continuous decline in the company's financial condition (Wruck, 1990; Khaliq et al., 2014; Thai et al., 2014; Xie et al., 2011; Prihadi, 2020). Early indications of the company can be recognized early if the financial statements are analyzed more closely in a certain way (Wruck, 1990; Khaliq et al., 2014; Thai et al., 2014). Financial ratios can be used as an indication of a company's bankruptcy rate (Beaver, 1966; Ohlson, 1980; Uğurlu and Aksoy, 2006). Companies are classified as in financial distress if Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) are less than 80% interest expense (Tinoco and Wilson, 2013). Andrade and Kaplan (1998) revealed the same thing that companies experienced financial difficulties in the first year marked by EBITDA of less than a financial expense.

Financial ratios measure a company's position in terms of liquidity, profitability, or debt, however, this ratio cannot test a company's overall financial strength, level of financial difficulty, and potential for bankruptcy. This is behind the creation of an index that can comprehensively assess the level of financial risk and the possibility of bankruptcy for the company (Altman, 1968; Deakin, 1972; Ohlson, 1980; Zmijewski, 1984). The index uses accounting information that the company discloses each period. Accounting data used in the index are working capital, total assets, retained earnings, earnings before interest and taxes, the market value of equity, the book value of total debt, and sales.

Fisher (1930) first developed a model to capture signals of bankruptcy, then continued by Beaver (1966) and Altman (1968). After Altman (1968), many alternative models for predicting bankruptcy include Springate (1978), Zmijewski (1984), Ohlson (1980), Deakin (1972), Hopwood (1994), and Shumway (2001). Altman has also updated his formula through Altman (1977). The ratios and coefficients in these models are developed and applied in developed countries, this is very possible when applied in developing countries so that the ratio does

not adequately represent the characteristics of the country explicitly. Çolak (2020) mentions that the accuracy of predictions for developing countries is not as strong as when applied in developed countries. The market value of equity in its research is entirely dependent on the company's stock price and most companies in developing countries do not have financial inventory in the market.

To predict financial conditions that reflect the financial health of companies in developing countries, a new model is needed that can represent the characteristics of financial performance in developing countries. Indonesia is a developing country that has a trend of economic growth that has been variable for the last ten years. The country's economic growth is supported by companies from various sectors. Companies experiencing financial difficulties are a crucial problem for the Indonesian economy, this must get the special attention that is taken seriously by practitioners such as business people, governments, policymakers, and academics.

Research on corporate failures is classified into two main approaches. The first is a market-based approach. A market-based approach, relying on the basic valuation of the company by investors (Çolak, 2020). A company's stock price is used to estimate possible financial failures. Companies that experience market value below the book value of liabilities are assumed to be in bankruptcy (Black and Scholes, 1973; Merton, 1974; Scott, 1987; Tinoco and Wilson, 2013). Market prices reflect the information contained in financial statements as well as other information not contained in financial statements (Agarwal and Taffler, 2008). Market-based variables can provide a direct assessment of volatility which is a strong predictor of bankruptcy risk (Tinoco and Wilson, 2013). The greater the volatility, the higher the likelihood of bankruptcy (Beaver et al., 2005). Research using a market-based approach attempts to estimate the likelihood of financial failure in different countries (Hillegeist et al., 2004; Vassalou and Xing, 2004; Reisz and Perlich, 2007; Campbell et al., 2008; Bharath and Shumway, 2008; Beaver et al., 2005).

Second, an accounting-based approach. An accounting-based approach uses a variety of financial ratios in predicting a company's financial condition. Financial analysts and investors identify financial difficulties through profitability, liquidity, solvency, and management efficiency in the implementation of funding and investment policies (Khaliq et al., 2014). Univariate and multivariate analyses were originally used by Beaver (1966), Altman (1968), Springate (1978), Zmijewski (1984), Ohlson (1980), Deakin (1972), and Hopwood (1994) to distinguish the company's financial health.

Research on new models to predict corporate financial distress in Indonesia which is a developing country is still rare. Most of the literature still uses the Altman Z-Score model, while the model first

appeared and was aimed at companies in America that were developed countries. This certainly raises questions about the effectiveness of financial ratios if applied in different companies and countries. This research aims to find a financial distress prediction model that is suitable for Indonesian companies.

2. Theoretical overview

Bankruptcy or financial failure occurs when the amount of liabilities exceeds the fair value of the asset or when the current liability exceeds current assets (Xie et al., 2011; Thai et al., 2014). Bankruptcy or financial failure experienced by most companies can have a devastating impact on the world economy. Bankruptcy is rapid in countries experiencing economic difficulties or financial crises. Corporate bankruptcy is characterized by a prolonged and continuous decline in the company's financial condition (Wruck, 1990; Khaliq et al., 2014; Thai et al., 2014; Xie et al., 2011; Prihadi, 2020).

Brigham and Daves (2003) describe financial distress begins when a company is unable to meet a payment schedule or when cash flow projections indicate that the company will soon be unable to meet its obligations. Some parties will be harmed if a company goes into bankruptcy. The aggrieved party is a party that has an interest in the company such as investors and creditors. Investors and creditors need to analyze financial information as a consideration in investment decision-making and debt.

2.1. Signal Theory

Signal theory explicitly reveals evidence that parties within a corporate environment consisting of officers and directors generally have better information about the company's condition and prospects compared to outsiders, such as investors, creditors, governments, even shareholders (Ghozali, 2020). Signals issued by the company can be financial statements, stock prices, or other information that describes the condition of the company. Companies that are in a state of financial distress have information that is not expected by outsiders, and vice versa.

Lev and Thiagarajan (1993) stated that information in financial statements is a useful signal to be able to assess and predict future economic events. The assumption is that accounting data (financial statements) are relevant as a basis for assessing the company's performance, including information as a basis for predicting future profits and dividends (Bauman, 1996). In this regard, Beaver (1966) explained that there are three relationship processes in it, namely: (1) profit is now useful for the prediction of future profit; (2) future earnings are indicators of the ability to pay dividends in the future; (3)

Dividends are expected in the future to be a discount from the company's present value.

2.2. Financial Distress and Bankruptcy Prediction Model

Penman (1992) states that fundamental analysis or intrinsic value analysis is an analysis using historical accounting data (numbers) of a company to predict future economic events, such as growth prospects, market performance, and reactions or outcomes of other economic events. The importance of information about the company's prospects, then a predictive tool or model that can be used to detect potential bankruptcy of the company (Campbell et al., 2008; Hanafi and Halim, 2016; Çolak, 2020). Prihadi (2020) explained that an analyst knows that the company is experiencing difficulties or vice versa, namely in a healthy condition can be recognized with several indications, including high profits with variations in the size of its profits, adequate liquidity, non-burdensome debt, and healthy cash flow. Prihadi (2020) also said the investment in debentures, there is a possibility that the debt is not paid off. The risk that occurs is the non-repayment of interest and not the return of principal debt. The problem is usually at the limit of the number of analysts who can say that the company is in bankruptcy.

Based on this, a model is created with a variety of variations. In general, the model is divided into 2, namely: (1) univariate model. This model relies on a single variable. Beaver's research (1966) concluded that the ratio of cash flow to total liabilities is the most powerful indicator in predicting bankruptcy, and (2) a multivariate model. The strongest ratios for predicting bankruptcy in this model have the following order: liquidity, solvency, profitability, and activity (Altman, 1968; Çolak, 2020). In some cases, many factors cause financial distress that continues in bankruptcy conditions. For example, poor business planning, problems with cash flow, inadequate capital structure, and large nominal debt. Other factors such as corporate accounting ratios were researched by Khaliq et al. (2014). Financial distress is measured using Multiple Discriminant Analysis (MDA) (Altman, 1968), with independent variable current ratio and debt ratio. The results showed that the current ratio and debt ratio affect financial distress. A good model of generating a measure of financial distress likelihood for international contexts put forward by Pindado et al. (2008) in his research in G-7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) provides another view of the measurement of financial distress. Financial distress as a dependent variable is measured by criteria: (a) EBITDA is smaller than financial expenses for 2 consecutive years, and (b) the fall in market value for 2 consecutive years. Pindado et al. (2008) use several variables of explanatory, namely profitability (EBIT / Replacement Value of Total Asset (RTA), Financial Expenses (FE / RTA),

Retained Earnings (RE / RTA). The results stated that the estimation of logit analysis methods is better when compared to discriminant analysis.

Tinoco and Wilson (2013) researched 3,020 non-financial companies in the UK with observation periods from 1980 to 2011 using a combination of accounting ratio, macroeconomic, and market variable and with logit panel models resulting in an accuracy rate of 85% in predicting corporate bankruptcy. Research by Xie et al. (2011) on manufacturing companies listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 2005 to 2007. They compared SVM models (Support Vector Machine) and MDA, resulting in SVM having a better accuracy rate of more than 80% compared to MDA.

A summary of some other literature on the use of bankruptcy prediction models and the resulting degree of accuracy is presented in Table I.

Table I. Accuracy Rate of Bankruptcy Prediction Model

Researchers	Type	Country	Accuracy Level
Leksrisakul and Evans (2005)	Altman modifications	Thailand	59,6%
Rashid and Abbas (2011)	MDA (modification of 3 new ratios of the balance sheet)	Pakistan	76,9%
Pascale (1998)	MDA	Uruguay	Almost 90%
Grammatikos and Gloubos (1984)	MDA, LPM (Linear Probability Model)	Greek	MDA is 80% more accurate than LPM
Rifqi and Kanazaki (2016)	MDA Logit	Indonesian	MDA error rate higher
Wang and Campbell (2010)	Altman Modifications	Chinese	Almost 90%
Thai et al., (2014)	Altman Combination	Malaysia	76,7%
Pervan et al., (2011)	MDA	Croatian	79,5%
Yilmaz and Yildiran (2015)	Z-Score	Turkish	89% solvency 71% insolvency
Oz and Yelkenci (2015)	Z-Score	Turkish	Solvency less than 40%

Aziz and Dar (2006) in their research explained bankruptcy studies using the MDA model applied to a sample of developed countries there are 30% of them by Boritz et al. (2007), Goudie (1987), Izan

(1984), Micha (1984), Taffler (1982). Other research is presented in Table II. Aziz and Dar (2006) explained the use of logistic regression (logit and probit) in cross-country research there were 21%, including by Becchetti and Sierra (2003); Fitzpatrick and Ogden (2011); Koh (1992); Lennox (1999); Lízal (2002); Ooghe and Verbaere (1985); Shumway (2001); Zmijewski, (1984).

Table II. Bankruptcy Study Using MDA

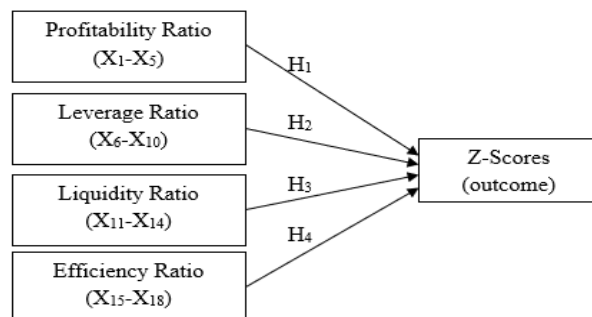
Company Conditions	Year of Observation
33 companies went bankrupt 33 solvency companies	1946 - 1965 (NYSE)
32 companies went bankrupt 32 solvency companies	1962 - 1966 (NYSE)
54 companies	1965 – 1975
115 companies	1954 – 1968
68 companies	1969 – 1975
84 small and medium-sized companies	1958 – 1965

Alaminos et al., (2016) developed a global bankruptcy model that applies to companies around the world, as well as separate models for companies in Asia, Europe, and the Americas. Alaminos et al. (2016) found that global models have a superior level of accuracy than regional models. Platt and Platt (2002) have different opinions. Platt and Platt (2002) questioned the single global model for prediction before bankruptcy superior to regional models developed separately for companies in the U.S., Asia, and Europe.

2.3. Framework and Hypotheses

Independent variables (predictors)

Figure I. Ratios to be tested in this Research



Effect of profitability ratio to financial distress prediction

The relationship of signal theory and profitability describes an action a company takes about management performance that can improve a company's future opportunities. This can be seen from the financial statement information that listed the company's profit. The company's profit is a form of the company's performance so that investors believe more that management has realized the wishes of investors.

Hanifah and Purwanto (2013), Tinoco and Wilson (2013), Colak (2021), Pindado (2008), Zmijewski (1984), Alaminos (2016), Thai et al. (2014), Zhang et al. (2010), and Rashid (2011) stated that the profitability ratio influences the possibility of financial distress to the point of bankruptcy. Profitability indicates the efficiency and effectiveness of the use of assets in resulting in the company's profit (Danre and Taqwa, 2014). Companies that have negative profits show the absence of effectiveness from the use of company assets to generate net income. The financial distress experienced by the company shows that the use of company assets in generating profits is not effective.

H1: Profitability ratios affect financial distress predictions.

Effect of liquidity ratio to financial distress prediction

The relationship of signal theory with liquidity states that good quality companies will give positive signals in the form of good information. Based on this information, investors are expected to be able to distinguish between companies in non-financial distress or financial distress. If the company can finance and pay off its short-term obligations properly, the company has the potential to experience financial distress that will get smaller. This means that the greater the liquidity ratio, the less likely the company is to experience financial distress. In line with the above research by Zmijewski (1984), Ugurlu and Aksoy (2006), Thai et al. (2014), Tinoco and Wilson (2013), Pindado (2008), Alaminos (2016), Colak (2021) state that the liquidity ratio has a role in predicting the company's financial distress.

H3: The liquidity ratio affects the prediction of financial distress.

Effect of efficiency ratio on financial distress prediction

A high level of efficiency indicates that the company is more effective in using assets to generate sales. The more effectively the company uses its assets to generate sales, it is expected to provide greater profits, in the end, the less likely the company is to be in financial distress. Regarding signal theory, this is a positive signal for investors. This positive signal is good news that provides information on the company's survival in the future.

According to Saleh and Sudiyatno (2015), efficiency affects financial distress, which means that high turnover indicates good management,

on the other hand, low turnover should make management evaluate its strategy, marketing, and capital expenditures. In line with this, research conducted by Zmijewski (1984), Alaminos (2016), Hidayat and Meirianto (2014), and Colak (2021) stated that there was a significant effect of the activity ratio (efficiency) in predicting financial distress in a company.

H4: The liquidity ratio affects the prediction of financial distress.

3. Data and methods

The population in this study is a manufacturing company listed on the Indonesia Stock Exchange. The sample in this study is a basic industrial and chemical sector manufacturing company with annual report data for 2015 - 2019. The basic industrial and chemical sectors were chosen because they are rapidly growing sectors. These sectors include cement, ceramics, metal, chemical, plastic, animal feed, wood, pulp, and paper. This sector is a cyclical sector due to ever-changing demand. The basic industrial and chemical sectors are sectors that are prone to collapse in the event of a crisis that can weaken the demand for products. In 2015 the sector was constrained by a weakened exchange rate that directly or indirectly suppressed the company's financial performance. This is one of them because the raw materials of the company are imported from abroad. The weakening of the rupiah also affects the amount of debt of some companies. The basic industrial sector and chemistry as some of the sectors that have a great contribution to the world of investment.

Sampling in this study used purposive sampling techniques. The sample in this study was divided into two groups, namely the first group is companies with non-financial distress conditions and the second group is companies with financial distress conditions (Çolak, 2020). Companies experiencing financial distress must pair with companies in non-financial distress conditions based on the same total assets (Grammatikos and Gloubos, 1984; Rashid, 2011) The sample criteria used in this study are: (1) manufacturing companies listed on the Indonesia Stock Exchange, (2) manufacturing companies that fall into the category of basic industrial and chemical sectors in 2015-2019, and (3) companies that fall into the category of financial distress must be paired with companies in the category of non-financial distress. based on the similarity of total assets. The final sample of the study obtained 150 samples with a grouping consisting of 15 companies in the category of non-financial distress and 15 financial distress companies.

3.1. Definition of variables

Dependent variables. The dependent variable in the study was financial distress. Platt and Platt (2002) explain that financial distress

is the stage of a company's diminished financial condition that occurs before bankruptcy or liquidation. Indicators of companies that fall into the category of financial distress are if they have negative equity, negative operating profit, or negative net income for two consecutive years. Companies in the financial distress category are code 1 (one). The Company is in a state of non-financial distress if it does not have negative equity, negative operating profit, or negative net income coded 0 (zero) (Çolak, 2020).

Independent variables. The independent variables in the study consisted of financial ratios that represented the ratios of profitability, leverage, liquidity, and efficiency. The number of ratios selected is 18 financial ratios (presented in the appendix). Financial ratios are tested repeatedly, then choose ratios that give statistically high significant results (Çolak, 2020). Based on these results, the new model is formed with a weight or coefficient value according to the sample used. The weight or value of the model coefficient is determined based on the results of the discriminant analysis test.

The discriminant analysis in this study was conducted with the aim of: (1) to find out whether there are clear differences between groups on dependent variables, (2) if there are differences, it can be known which independent variables in the discriminant function make the difference, and (3) classify the object. Discriminant analysis is done after the quality of the data has been tested with several testing techniques, namely data outlier, normality test, and data homogeneity test. The discriminant analysis stages in this study are: (1) identifying discriminant variables, (2) the process of determining variables, (3) determining the significance of discriminant functions, (4) interpreting the results of variable analysis, and (5) determining the discriminant function of discriminant equations in this study are as follows.

$$Z = a + b_1 X_1 + + b_n X_n \quad (1)$$

4. Results

The study divided the data into two groups. The first group (code 0) is a non-financial distress company and the second group (code 1) is a financial distress company. An independent variable, in this case, is a financial ratio that represents the ratio of profitability, leverage, liquidity, and efficiency. The number of ratios selected to be tested is 18 ratios. Of these, selected the four most powerful ratios jointly correlated with bankruptcy. The results of the discriminant function are presented in Table III.

Table III. Significance Canonical Correlation, and Coefficient

Variable	Function
EBITNS (X3)	0.062
WCTA (X12)	0.030
STA (X15)	0.007
INVS (X18)	-0.010
Constant	-0.999
Significance	0.000
Eigenvalue	0.857
Canonical Correlation	0.679
% of Variance	100
Chi-Square	73.671
Function Group Centroid: NFD	0.799
FD	-1.055

The study only formed two groups, so there was only one discriminant function. The test results showed an eigenvalue value of 0.857 with the variance described covering 100%. Canonical Correlation of 0.679 or magnitude square canonical correlation (CR2) = (0.679)² or equal to 0.461. The value of 0.461 can be concluded that 46.1% variation between groups of companies experiencing financial distress and non-financial distress can be explained by the variables of the discriminant ratio of EBITNS, WCTA, STA, and INVS. Table III presented the chi-square number of 73,671 with sig. level of 0.000. These results showed that there was a significant difference between the two groups of financial conditions of the company (financial distress and non-financial distress) in the discriminant model.

The models formed in this study are:

$$Z = -0.999 + 0.062 \text{ EBITNS} + 0.030 \text{ WCTA} + 0.007 \text{ STA} - 0.010 \text{ INVS} \quad (2)$$

The next goal of discriminant analysis is to classify future observations into one of two groups of companies. The results of the discriminant analysis give a classification level value of 100%. Classification from observation will essentially reduce the division of discriminant space into two regions.

The discriminant score value that divides space into two regions is called the cut-off value. The higher the EBITNS, WCTA, STA, and lower the INVS value, the higher the discriminant score value and vice versa. Because companies that have financial health will have a higher financial ratio value, a healthy company will have a higher discriminant score than a bankrupt company. Companies will be grouped in the category of non-financial distress if the discriminant score is higher than the cut-off value and the company will be grouped as a company experiencing financial distress if the discriminant score is smaller than the cut-off value. This study has issued outlier data as much as 27 data so that there is an inequality in the number of samples from both

groups. Group 1 non-financial distress amounted to 70 data and group 2 financial distress amounted to 53 data.

The cut-off formula used for the sample number of the two groups is not the same as the following.

$$Z \text{ cut-off} = \frac{(n_1 Z_1 + n_2 Z_2)}{(n_1 + n_2)} \quad (3)$$

Information:

Z cut-off = Z cutting score for groups that are not the same size,

n1 = Number of group members 1,

n2 = Number of group members 2,

Z1 = Centroid group 1, and

Z2 = Centroid group 2.

Based on formula 3 the specified cut-off value is 0.00. The value indicates if the Z-score is above 0.00 then enter group 1 (nonfinancial distress), conversely if below 0.00 then enter group 2 (financial distress).).

After the discriminant function is obtained and determines the cut-off point, then tests the classification of discriminant functions, it will then be seen how much the classification properly classifies the category. The results of the classification can be seen in the table below.

Table IV. Classification Results

			Predicted Group Membership		Total	
Original	Count	Condition	NFD	FD	Original	
		NFD	57	13		
	%	FD	7	46	Cross validated ^b	
		NFD	81.4	18.6		
Cross-validated	Count	FD	13.2	86.8		
		NFD	56	14		
	%	FD	8	45		
		NFD	80.0	20.0		
		FD	15.1	84.9		

In Table IV, the sample data is initially in the NFD category and after the classification of discriminant functions remains in the NFD category of 57 data. Sample data that was initially with a discriminant model in the NFD category then changed to the FD category of 13 data. Otherwise, the sample which was originally FD category as much as 46, changed to category NFD as much as 7.

Based on the results on Tabel IV, the accuracy of the predictions of the model is:

$$\frac{(57+46)}{123} = 0.837 = 83.7\%.$$

The discriminant model is worth using for discriminant analysis or valid for use in this study because it obtained a high accuracy rate of 83.7%. Once proven that the discriminant function has high predictive accuracy, then the discriminant function can be used as a model to predict the financial condition of manufacturing companies, especially the basic industrial and chemical sectors in Indonesia.

5. Discussion

Financial information about profitability is a positive signal that is useful for predicting the financial distress condition of manufacturing companies in the future. The EBITNS variable used to measure the level of profitability can distinguish significantly between groups of financial conditions in manufacturing companies. The results of the MDA test concluded that the Earnings Before Tax to Net Sales (EBITNS) ratio was shown to significantly predict a company's future financial distress, with a significance rate of 5%. The results of this study support the findings of previous research. The selection of profitability ratio as one of the best determinants in predicting financial distress is in line with Tasman and Kurniawati (2014). This means that the profitability ratio needs serious attention from company managers to be more alert to the symptoms of bankruptcy. The sooner the symptoms of bankruptcy are known the better so that managers can take immediate corrective action in the future (Masdupi et al., 2018).

Profitability ratios can act as informers by looking at the income and the number of costs incurred. Increased costs and decreased revenue from year to year can result in an increased amount of net loss from year to year so that the company can experience financial distress (Dirman, 2020). Management performs actions to provide instructions to investors in assessing the company's prospects. Management will strive to improve the company's performance because by improving the profitability performance of the company will also increase. Information about the company's performance is a signal to external parties about the future condition of the company (Scott, 2014)).

The results of the MDA test showed that the Working Capital to Total Assets (WCTA) ratio could be used in financial distress prediction models. Khaliq et. al (2014) mentioned that liquidity is one of the important things as a determinant in identifying the financial distress of companies. The company's liquidity will depend on the liquidity level of the company. In line with this, Jepkorir et. al, 2019 explained that liquidity has an important role in determining the success or failure of the company in business performance because it affects the profitability of the company. Business success relies heavily on the ability of financial managers to effectively manage the working capital component (Filbeck and Krueger, 2005).).

A good quality company will give a positive signal in the form of good information, so it is expected that investors can distinguish companies that are in a condition of non-financial distress and or financial distress conditions. The more able the company is to finance and pay off its short-term obligations, the less likely the company is to be in a state of financial distress. Conversely, the more the company is unable to finance and pay off its short-term obligations, the greater the chance of the company being in a state of financial distress.

About the level of efficiency of the use of company resources, the study of the ratio of efficiency and financial distress is very important. A company's efficiency measures how productively a company uses its assets and financial distress conditions significantly affect productive capacity (Brealey and Meyers, 2000). This statement is supported by the results of the MDA test which shows that the Sales to Total Assets (STA) and Inventory to Sales (INVS) ratios contribute to the model. The efficiency ratio is a parameter of the company's survival as well as a reflection of the effectiveness of the use of assets in one year, which can determine the condition of the company's financial distress (Ufo, 2015). Company managers have a desire to convince investors that their company should be judged better based on what managers know that the company's prospects are indeed good (Ghozali, 2020).

About efficiency ratios, this ratio measures the efficiency of a company's resource use over how many times turnover has occurred over a given period. That is, the better the utilization of company resources on the assumption that the company makes efficiencies in the treatment of its resources shows that the less likely the company is experiencing the possibility of financial distress. This makes it clear that the company gives signals in decision-making regarding financial distress situations through efficiency ratios.

The leverage ratio in this study did not contribute to the model. Companies with high leverage are not necessarily categorized as companies that experience financial distress conditions, but companies with lower leverage are not necessarily categorized as companies in a non-financial distress situation. This is due to the high total liabilities of the company but the total assets owned by the company are also high, so the company can afford to pay obligations with the assets owned. These results are in line with research conducted by Sporta et al. (2017), Bernardin and Tifani (2019).

6. Conclusion

The data of this study show that the financial ratios that play a role in the financial distress prediction model are profitability ratios, liquidity ratios, and efficiency ratios. The results of the study agree that the profitability ratio can provide information on the level of management

effectiveness of a company indicated by profits generated from sales or investment income. Liquidity ratios contribute to describing a company's ability to meet its short-term obligations that are due immediately. Prastowo (2015) said that although short-term creditors are always advised to focus their attention on the profits of ordinary shareholders, the focus of creditors' attention is usually poured in the other direction. Short-term creditors pay more attention to the company's prospects in paying short-term obligations. These creditors are more attractive to cash flow and working capital management than how much accounting profit the company reports. Activity ratio complements the formulation of the financial distress prediction model in measuring the efficiency of the company's resource utilization (sales, inventory, debt collection, and others).

Limitations in this study. This research has limitations in categorizing the financial condition of the company based only on the financial statements of the publication. The study also did not retest the Altman Z-Score model with different variable coefficients resulting from the study sample. The research implies that the resulting model can contribute and as a basis for the development of future studies on the company's relevant, robust, and accurate financial distress early warning systems that will help stakeholders to respond to potential bankruptcies appropriately and promptly. Advice for companies, the test results show that the ratio of profitability, liquidity, and efficiency is an important predictor in determining the financial condition of the company so that the company is expected to maintain the performance of these ratios to provide a good signal for investors. Information released by the company is a signal that will affect the decisions of investors or creditors. The advice for future research is to add and develop predictor variables, so that the resulting model will be more complete which represents some existing financial ratios, and retest the Altman Z-Score model with different variable coefficients resulting from the research sample.

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