

Financial Ratio Analysis In Predicting Financial Distress Of Food And Beverage Companies With Logistic Regression

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Abstract

The purpose of this study is to analyze the effect of financial ratios such as leverage, liquidity, activity, and profitability on the possibility of financial distress (financial distress). The population in this study are all food and beverage companies listed on the Indonesia Stock Exchange in the period 2017 - 2020 totaling 30 companies. The samples taken were 6 food and beverage companies using a purposive sampling technique, namely the selection of samples based on certain criteria. The number of observations that were processed and analyzed were 18 observations. Logistics Regression is the method used in this research. The results showed that the activity ratio and leverage ratio had a significant effect on predicting financial distress, while the liquidity ratio and profitability ratio had no significant effect on predicting financial distress..

Keywords: financial distress; regresi logistic; financial ratio

Introduction

Financial reports are made with the aim of providing information to interested parties for decision making. According to Kasmir (2019) that one of the objectives of financial statements is to provide information about the company's management performance in a period. If a company does not pay attention to its performance, it will experience financial difficulties which will eventually go bankrupt. In various studies and according to the opinion of experts, it is stated that financial statements can be used as a basis for measuring the health of a company. The ratio analysis method is a comprehensive way of assessing the performance of a company. Parties such as investors, shareholders, or the government often use this method to evaluate certain aspects of a company's performance. So that in the financial statements by looking at the company's financial ratios, it is possible to detect financial difficulties.

Financial distress is a condition when a company experiences a financial crisis and fails to meet debtors' obligations because they do not have the

funds to continue their business. This condition is accompanied by a decrease in profits and fixed assets and usually occurs before bankruptcy.

Research conducted by Edward I Altman (1968) is an early study that examines the use of financial ratio analysis as a tool to predict the bankruptcy of manufacturing companies that go public. Altman's model is known as the Z-score, which is a score determined from the standard calculation times financial ratios that indicate the level of probability of the company's bankruptcy.

The analysis of financial statements is carried out using the 2017-2020 time interval. This is done to be able to update previous research. Then the financial ratios used in predicting financial distress are the financial ratios of Food and Beverage companies listed on the Indonesia Stock Exchange.

The purpose of this study was to determine whether ROA, CR, TATO, DTA affect Financial Distress.

Literature Study

Financial statements

The definition of Financial Statements according to PSAK No.1 (2015:2) is as follows: In the financial reporting process in which there are the financial statements. Balance, income statement, statement of changes in financial position, notes and other statements and explanatory material that are an integral part of the contents of the report is a complete financial statement. It also contains a schedule and additional information related to the report, the financial diantarainformasi industrial and geographical segments and the disclosure of the effect of price changes.

According to the Indonesian Accounting Association (IAI, 2015), financial statements are a structured presentation of the financial position and performance of an entity. So financial statements are records that reveal the business activities and financial performance of a company.

Financial Distress

Financial distress is a final process of declining performance before going bankrupt based on Platt and Platt in (Kusumawati & Karuniawati, 2019). Financial distress occurs due to cash flow difficulties, large amounts of debt, and losses in the company's operational activities for several years. Meanwhile, According to Brigham and Daves in (Mafiroh & Triyono, 2018) when a company cannot make payments on schedule or when cash flow projections indicate that the company's obligations will not be fulfilled soon, that is a condition where the company experiences financial difficulties. Harahap in (Hanafi & Stevanus, 2018), the company's internal financial distress indicators are:

- a. Decrease in sales volume due to management's inability to implement policies and strategies.

- b. The company's ability to generate profits or company profits has decreased.
- c. Depending on the creditors, the company has a very large debt, so its obligations are getting higher.

On the other hand, (Ratna & Marwati, 2018) revealed several indicators to identify signs of financial difficulties seen from external parties, namely:

- a. Decrease in the amount of dividends distributed to shareholders for several consecutive periods.
- b. Continuous decline in profits and the company suffers losses.
- c. The closing or sale of one or more business units.
- d. Massive layoffs of employees.
- e. Prices in the market began to decline constantly.

Profitability Ratios and Financial Distress

According to Putra (2009), the profitability ratio is a ratio that measures how effective the company's management and executives are as evidenced by the ability to create profit value. According to Widarjo & Setiawan (2009) in (Antikasari & Djuminah D, 2017) Reduced costs incurred by the company is a result of the effective use of company assets. Henceforth, the company will obtain savings and will have adequate funds in carrying out its business activities. With adequate funds, the company has a smaller opportunity to experience financial distress. The higher the company's ability to generate profits, the less likely the company is to experience financial distress. In this study, the profitability ratio is measured by ROA, indicating the ability of the capital invested in overall assets to generate net profits. The profitability ratio has a negative and significant influence in predicting

financial distress (Lawrence et al., 2015 in (Antikasari & Djuminah D, 2017). Research conducted by (Al-khatib, 2012) reveals that profitability has no effect on financial distress. The Return of Assets (ROA) ratio can predict the possibility of financial distress with a positive influence (Antikasari & Djuminah D, 2017). This ratio is used to measure the effectiveness of the company in managing its assets. The amount of assets that are too much will cause a large cost of capital, so it will suppress profits. Conversely, assets that are too small will lead to the loss of profitable sales.

H1: ROA has a negative effect on financial distress.

Liquidity Ratio and Financial Distress

According to Syamsuddin (2004), the liquidity ratio is a ratio that measures the company's ability to pay debts which must immediately be filled with current assets. Azwar (2015) dalam (Antikasari & Djuminah D, 2017) reveals that a company is in a liquid state if the company has payment instruments or current assets that are greater than its current debt and are able to meet its financial obligations on time. The higher the liquidity ratio, the less likely the company is to experience financial distress. In this study, the liquidity ratio is measured by the current ratio which shows the ability to pay debts which must be met immediately with current assets. The results of research by (Nurfajrina et al., 2016) that the liquidity ratio as measured by the current ratio and cash ratio has no effect on financial distress. Research conducted by (Ahmad, 2013) shows that the liquidity ratio has a significant effect on financial distress.

H2: CR has a negative effect on financial distress.

Activity Ratio and Financial Distress

According to Riyanto (2011) activity ratios are ratios used to measure the effectiveness of the company in

working on its funding sources (inventory turnover, total asset turnover, average collection period and so on). The activity ratio in this study is measured using total asset turnover, which aims to measure the effectiveness of the company in managing its assets. Research conducted by (Hidayat & Meiranto, 2014) shows that the activity ratio has a negative effect on financial distress.

H3: TATO has a negative effect on financial distress.

Leverage Ratio and Financial Distress

According to Kasmir (2018), the leverage ratio is a ratio used to measure the extent to which a company's assets are financed by debt. This ratio can be calculated based on information from the balance sheet, namely in the items of assets and items of debt. According to (Antikasari & Djuminah D, 2017) companies that have a higher level of debt are more likely to experience financial distress or bankruptcy than companies that have less debt. In this study, the leverage ratio is measured by debt to total assets. This ratio shows some of the assets used to guarantee debt. Research conducted by (Widhiari & Aryani Merkusiwati, 2015) reveals that the leverage ratio has no effect on financial distress.

H4: DTA has a positive effect on financial distress.

Altman (1968) uses financial ratios to predict the bankruptcy of a company. By examining as many as 66 companies in America using the Multivariate Discriminant Analysis (MDA) approach, which is often known as the Altman Z-score method. There are shortcomings that are often found in the MDA approach in terms of the assumption of data normality and group dispersion. This causes a bias towards the level of significance and estimated errors (Ohlson, 1980).

The Binary Logit Regression (BLR) method to predict company bankruptcy was first performed by Ohlson (1980) in (Antikasari & Djuminah D, 2017). His research shows that company size (size), financial structure (total liabilities to total assets), performance and current liquidity are the ratio groups (variables) that are significant determinants in predicting bankruptcy.

Research Method

Population and Sample

The population is the entire object to be observed related to the problem under study. The population observed in this study were food and beverage companies listed on the Indonesia Stock Exchange from 2017-2020. The sample selection is done by purposive sampling technique, which is the selection of samples with certain objectives and appropriate criteria. The criteria to be used are: (1) Food and beverage sector companies listed on the IDX. (2) The company's financial statements are complete and have been audited. (3) The components required in the calculation process are clearly stated in the financial statements. Based on the sample selection criteria, the companies that can be sampled in this study are 6 companies which can be seen in Table 1. This study uses secondary data about the company's financial statements sourced from www.idx.co.id in 2017 to 2020.

Table 1. Research samples

Company's name	CODE
PT Inti Agri Resources Tbk	IHKP
PT Magna Investama Mandiri Tbk	MGNA
PT Prima Cakrawala Abadi	PCAR
PT Prasadha Aneka Niaga	PSDN

PT Tri Banyan Tirta	ALTO
PT Bumi Teknokultura Unggul	BTEK

Research variables and operationalization variables

The dependent variable in this study is a company experiencing financial distress. Determining companies experiencing financial distress will be done using the Altman Z-Score method for manufacturing companies. The formula is:

$$Z\text{-Score} = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5$$

X1= Working Capital to Total Assets

X2= Retained Earnings to Total Assets (retained earnings to Total Assets)

X3= Earnings Before Interest and Taxes to Total Assets

X4= market value equity to book value of total debt

X5= Sales to Total Assets (Sales to Total Assets)

Ratio measurement scale for Z Score

If $Z \geq 2.99$ including safe zone. If $1.81 < Z < 2.99$ including the green zone. If $Z \leq 1.81$, it is a distress zone. In this study only took 2 categories, namely if $Z \leq 1.88$, it was classified as a company experiencing financial distress. If $Z > 1.88$, it is classified as a company that does not experience financial distress.

Nominal measurement scale for Z Score

Dummy Variable: 0 = companies experiencing financial distress. 1 = companies that do not experience financial distress.

Table 2. Independent variable

Independent Variable	Proxy	Measurement
Profitability Ratio	ROA	$ROA = \frac{EBIT}{Total\ Asset}$
Liquidity Ratio	CR	$CR = \frac{Current\ Asset}{Current\ Liabilities}$
Rasio Aktivitas	TATO	$TATO = \frac{Net\ Sales}{Total\ Asset}$
Rasio Leverage	DTA	$DTA = \frac{Total\ Debt}{Total\ Asset}$

Model Analysis

The analytical method used in this study is binary logistic regression. Logit model is a non-linear

regression model in which the dependent variable is categorical. Based on research conducted by Azwar in (Antikasari & Djuminah D, 2017) the analysis model is as follows

$$\text{Ln} \frac{P}{1-P} = \beta_0 + \beta_1 CR + \beta_2 ROA + \beta_3 TATO + \beta_4 DTA$$

$\text{Ln} \frac{P}{1-P}$ = Ln comparison of the probability of financial distress and non-distress

β_0 = konstanta

β_1 = regression coefficient of CR

β_2 = regression coefficient of ROA

β_3 = regression coefficient of TATO

β_4 = regression coefficient of DTA

The level of significance used in this study is 0.1, which means that the probability that the results of drawing conclusions will experience errors is 10%. The criteria for accepting and rejecting the hypothesis are carried out in the following way: (1) If the significance value (Sig.) > 0.1 then the research hypothesis is rejected or the regression coefficient is not significant. This means that partially the independent variable has no significant effect on the dependent variable. (2) If the significance value (Sig.) < 0.1 then the research hypothesis is accepted or the regression coefficient is significant. This means partially the independent variable has a significant influence on the dependent variable.

Hypothesis testing

Hypothesis testing is carried out to determine the extent to which the independent variable (financial ratio) has a significant effect on the dependent

variable (financial distress condition). The significant level used is 0.1 or 10 percent with the decision criteria are: (1) If the significance value is > 0.1 then the null hypothesis is accepted or the partial effect of each regression coefficient is not significant. (2) If the significance value is <0.1 then the null hypothesis is rejected, which means that the partial effect of each regression coefficient is significant.

Result and Discussion

Goodness of Fit Test/Simultaneous test

Table 4 shows the Chi Square value of 5.949 with a sig value of 0.653 which is greater than 0.1. This means that the model is feasible to be analyzed by logistic regression analysis. Chi-square estimation is intended to determine the effect of ROA, CR, TATO, and DTA in predicting financial distress.

Table 4. Goodness of Fit Test

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	5,949	8	,653

Overall Model Fit

Table 5. Overall model Fit

Block	-2 Log likelihood
0	24,564
1	15,556

Table 5 illustrates the feasibility of the logistic regression model by including the independent variable based on the decrease in the initial -2 log likelihood

value (block number 0) of 24,544 to the -2 log likelihood value of block number 1 of 15,556. With the decrease in the value of -2 log likelihood, this shows that the model used is a good regression model and is feasible to use.

Table 6 Coefficient of Determination

	Nagelkerke R Square
Step 1	0,688

Table 6 shows the coefficient of determination which means the ability of the independent variable to explain the variable using the Nagelkerke R Square value. The value of Nagelkerke R Square is 0.688. In other words, the condition of financial distress can be explained by 68.8 percent by financial ratios while the remaining 37.2 percent can be explained by other variables that are not included in the model.

Logistics Regression Analysis Test Results

To test the hypothesis, a logistic regression test was used which was carried out on all variables, which is profitability, liquidity, activity and leverage ratio in predicting financial distress.

Based on Table 8 the test results are as follows:

$$Y = 0.415 + 0.004 CR + 0.584 ROA + (-2.696) TATO + 6.636 DTA$$

The figures generated from these tests can be explained by the results of statistical hypothesis testing in Table 8.

Table 8. Partial test of independent variable

		B	S.E.	Wald	df	Sig.
Step 1 ^a	CR	,004	,029	,014	1	,905
	ROA	,584	7,909	,005	1	,941
	TATO	-2,696	1,385	3,787	1	,052
	DTA	6,636	3,654	3,298	1	,069
	Constant	,415	1,355	,094	1	,759

Table 8 explains that the regression coefficient for CR has a significance value of 0.905 (> 0.1) which means that the hypothesis is accepted so that it can be concluded that the liquidity ratio has no significant effect in determining financial distress. The same result is shown by ROA with a significance value of 0.584. While the significance value for TATO and DTA (0.052 and 0.069) appears smaller than 0.1 so it can be concluded that the activity ratio and leverage ratio have a significant effect in determining financial distress.

DISCUSSION

Based on the partial test results which show that for food and beverage companies in the 2017-2020 period, financial ratios that have a significant effect in predicting financial distress are the activity ratio and the leverage ratio. This means that companies that have high TATOs are more effective in managing their assets. So the greater this ratio means that the assets can be rotated faster and make a profit, it also shows the more efficient use of all assets in generating sales. When the company converts its inventory to cash more quickly, the possibility of financial distress is getting smaller. These results are in line with research conducted by (Antikasari & Djuminah D, 2017). And companies that experience financial distress generally have a high DTA ratio and show a debt amount that is almost as large as their total assets and there are even companies that have a total debt. Companies that have more debt than their total assets generally have negative equity. So it is possible that companies that have a fairly high amount of debt will violate debt agreements with creditors because the amount of assets owned cannot guarantee the debts of the company and companies that have high debt will also be charged high interest costs while the amount of debt owed higher than the total assets of the company causes the

book value of the company's equity to be negative. The results of this study are also in accordance with the research of (Antikasari & Djuminah D, 2017) which state that the leverage ratio can be used to predict financial distress conditions.

Conclusions

The conclusion from the results of the study with reference to the discussion that has been carried out is that there is a significant effect of the activity ratio and leverage ratio on the potential for financial distress, while the liquidity and profitability ratios show the opposite result where the influence of the two ratios is not significant in determining financial distress.

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