ATLANTIS PRESS
Advances in Economics, Business and Management Research, volume 220
6th Global Conference on Business, Management, and Entrepreneurship (GCBME 2021)

Does Liquidity or Profitability Influence Firm Financial Distress Most? Empirical Study on Manufacturing Companies Listed in Indonesia Stock Exchange (2015-2019)

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ABSTRACT
This study aims to see how liquidity ratios and profitability ratios can predict the likelihood of financial distress and which ones have the most influence. This study took 7 (seven) ratios included in the category of liquidity ratios and profitability ratios. The object of this research was carried out in manufacturing companies listed on the Indonesia Stock Exchange in 2015-2019 with a sample size of 107. This study uses logit regression because financial ratios do not have to be normal if used and logit can predict the percentage of accuracy. The results showed that the ratio of working capital to total assets and the ratio of net income to equity dominated the contribution in determining financial distress with the overall accuracy percentage being 88.9%.

Keywords: *Financial Distress, Liquidity Ratio, Profitability Ratio.*

1. INTRODUCTION

One of the company's goals is healthy finances, so bankruptcy is something to be feared. The company does not immediately go into bankruptcy but begins with an indication of financial health. Companies that will experience bankruptcy first experience financial difficulties, known as financial distress. Financial distress is a condition that shows the stage of decline in the company's financial condition that occurred before bankruptcy or liquidation [1].

Financial difficulties occur due to a series of mistakes in making inappropriate decisions and weaknesses that are interconnected for a long time so that they contribute directly or indirectly to the company's management. There are various ways empirical studies define financial distress when the net cash out-flow is negative [2], formal (legal) bankruptcy notification in debt payments [3], negative operating net income [4], Earning per Share [5], the company's cash flow projection cannot fulfill its obligations [6], negative net income [7].

The importance of predicting financial distress has been the concern of researchers since the 1960s which was raised by [8] with a univariate model with a prediction rate of 90%, then [9] with a multivariate model using financial ratios to predict bankruptcy with very accurate results in classifying 95% of the total sample correctly one-year before failure, then research by [10] using logit.

Using financial ratios in predicting financial distress continues to grow. Financial ratios serve as the fundamental basis for evaluating a company's financial capabilities and provide useful information for predicting the firm likelihood of default [11]. Reference [12] study on companies in China found that financial indicators such as net profit margins of total assets, return on total assets, earnings per share, and cash flow per share, play an important role in the prediction of a decline in profitability. Reference [13] stated that financial variables provide important information in predicting financial difficulties. Reference [14] stated that profitability and liquidity ratios are very good predictors.

This study also aims to explore how financial ratios, especially liquidity ratios and profitability ratios, are predictors of financial distress in manufacturing companies listed in Indonesia. Manufacturing companies

constitute the majority of companies on Indonesian listed (IDX), they play an important role in economic growth. It is interesting to find the main ratios that can discriminate between distressed and non-distressed. The liquidity ratio and profitability ratio are selected such that they maximize the prediction accuracy of financial distress. Moreover, since the inquiry of higher accuracy has been a driving force in steering research towards financial distress prediction, the method the predictive accuracy, namely the Logit was used in this study. Investigating financial distress can be used as a warning signal, providing a basis for making better decisions before it is too late.

1.1. Literature Review and Hypothesis

1.1.1. Financial Distress

Predicting the company's financial distress is important to get the early signs of bankruptcy as part of an early warning system for management. Management can anticipate and improve company performance early on. Companies experiencing financial difficulties will experience liquidity difficulties to meet their financial obligations. If this continues, it will lead to the bankruptcy of the company.

Various researchers have defined financial distress. When the company's cash inflows are lower than cash outflows, it reinforces the condition of financial distress [2]. The company’s profitability declines thereby increasing the possibility of the company’s inability to pay principal and interest on debt [15]. Financial distress is a condition in which a firm has insufficient earnings to pay its financial obligations [16]. Financial distress is a situation where the company’s operating cash flow is insufficient to meet current obligations (such as trade credit or interest expense) and the company is forced to take corrective action [17].

Empirical studies have shown the characteristic firm in financial distress, such as interest coverage ratio [18], Earning per Share [5], a company’s stock price (Bose, 2006), insufficient cash flow [17], insufficient operating profitability, net income [7]. In this study, the company's financial distress is reflected in the net income condition as mentioned by [7].

If the financial distress situation is not immediately addressed, it will cause the company to go bankrupt, so predictions need to be made. To predict financial distress, various methods are used. Reference [8] used the application of statistical techniques to bankruptcy prediction, with the univariate analysis. Reference [9] tried to develop a multivariate method to achieve 90% accuracy and later became known as the Altman Z-Score. Another well-known method is the S-Score by [19] using the multiple discriminant analysis (MDA) method. Then research [20] and [10] using logit.

1.1.2. Financial Distress Predictors

The study of corporate financial distress became famous in the 1960s when [8] and [9] used financial ratios to predict bankruptcy. Since then, academics and researchers around the world have experimented with various ratios to identify the most important variables predicting bankruptcy and the most effective methods for identifying these variables. Financial ratios were found to be most useful in predicting distress and bankruptcy.

The financial ratios are chosen based on their popularity and significance in the previous studies. Profitability and liquidity ratios are very good predictors [14, 21]. This study also focused on liquidity and profitability ratios as predictors of financial distress.

Liquidity is a reflection of the company's ability to immediately settle the company's short-term obligations. Reference [1] have shown that the liquidity ratio is an important predictor of financial distress. Five ratios indicating company's liquidity ratio are used; the ratio of current assets to current liabilities, the ratio of a current asset to total asset, the ratio of a current asset to total liabilities, the ratio of networking capital to total asset, and the ratio of networking capital to sales (refer table 2). This study expected that all liquidity ratios have a negative effect on financial distress.

Profitability is a reflection of the company's performance which represents the company's ability to fulfill its obligations and play an important role in the company. In this study, two profitability ratios are chosen, namely Return on Equity and the ratio of profit to networking capital [11]. Variables were selected based on some literature surveys on the ability of a ratio to indicate financial distress predictor. This study expected that the profitability ratio has a negative effect on financial distress. Variables selected are based on some literature surveys on the ability of ratio to indicate financial distress predictor.

1.1.3. Hypothesis

Referring to the literature on financial distress, the hypotheses composed in this study are as follows

H0 1: Current assets to current liabilities are related to financial distress.

H0 2: Current asset to total asset is related to financial distress.

H0 3: Current asset to total liabilities is related to financial distress.

H0 4: Networking capital to the total asset is related to financial distress.

H0 5: Networking capital to sales is related to financial distress.

H0 6: Return on Equity is related to financial distress. H0 7: Net Income to networking capital is related to financial distress.

2. METHODS

2.1 Sample

The sample of this study covers 107 manufacturing on the Indonesia Stock Exchange (IDX) which were selected through purposive random sampling with the criteria is the sample must have complete data related to the research variables. Manufacturing companies are the largest sector in IDX and contribute greatly to the Indonesian economy. The company as a sample is also a consistent company during the period 2015- 2019 staying on the Indonesia Stock Exchange.

Table 1. Samples.

Criteria	
Population IDX 2019	696
Non Manufacturing	(522)
IPO after 31 Dec 2014	(67)
Sample	107

(source IDX 2015-2019: data processed)

Total annual observations are 4,056, without outlier data, consisting of 976 observational data of distressed companies and 3,080 observational data of healthy companies.

2.2 Variables

The dependent variable in this study is financial distress. Based on the definition of corporate financial distress, the company in negative net profit is used as a proxy for financial distress [7]. Dependent variable consists of a dummy variable, coded (0) if the firm experienced financial distress (has a negative net income) and (1) if not.

Independent variables are as financial distress predictors. The predictors are liquidity ratios and profitability ratios measured by current assets to current liabilities, current asset to total asset, current asset to total liabilities, net working capital to total asset, networking capital to sales, Return on Equity, and profit to net working capital.

Table 2. Calculation of variable values

Variable	Indicator	References
Y Financial distress	(0) negative net income (1) if not	[7]
X1 (CACL)	$\frac{current\ asset}{current\ liabilities}$	[22]
X2 (CATA)	$\frac{current\ asset}{total\ asset}$	[23]
X3 (CATL)	$\frac{current\ asset}{total\ liabilities}$	[24]
X4 (WCTA)	$\frac{net\ working\ capital}{total\ asset}$	[25]
X5 (WCTS)	$\frac{net\ working\ capital}{sales}$	[25]
X6 (NITE)	$\frac{net\ income}{equity}$	[11]
X7 (NIWC)	$\frac{net\ income}{net\ working\ capital}$	[11]

Methodology

To measure the strength of the relationship between the variable Y with the variable X in this study, logit regression was used. The logit regression model is the most used in predicting financial distress [26]. The econometric functional models used to determine the firm's specific factors influencing leverage is as follows:

$$Li = \ln \frac{Pi}{} = \beta 0 + \beta 1\ X1 + \beta\ 2\ X2 + \beta\ 3\ X3 + \beta\ 4\ X4 + \beta 5\ X51\text{-}P1 + \beta 6\ X6 + \beta 7\ X7 \quad (1)$$

Since the logit model provides a score between 0 and 1, if the predicted probability is greater than 0.5, this study will classify this observation as distressed, but if the probabilistic score is less than 0.5, the observation will be classified as non-distressed [27].

3. RESULTS AND DISCUSSION

Financial ratios, especially liquidity and profitability ratios, can be used to detect the probable failure of a company. Financial ratios especially liquidity and profitability can make it easier for many companies to detect the "illness" before the failure occurs. However, it is not that easy to detect failure only from the company's financial ratios because it could be an "illness" due to non-financial or macroeconomic factors. Further research is needed to add non-financial and macroeconomic factors.

The empirical finding shows that CACL as a financial distress predictor supported the findings of [28] in Malaysia, who found evidence when CACL increase, financial distress will decrease. Reference [1] and [23] also found the impact of CACL to financial distress. WCTA was included by [9] as among the five that were used in the well-known Z-Score is a strong predictor of financial distress, and it supports the finding

of [22], [25]. NITE is also a good predictor, which is in contrast to the previous studies by [11] that NITE was not a strong predictor. NIWC as profitability ratio shows as a predictor for financial distress in this study but was not in [11] research.

3.1 Descriptive Analysis

Descriptive statistics highlight several important indictators to help explain the general picture of research results.

Table 3. Descriptive Statistics.

Distressed	CACL	CATA	CATL	WCTA	WCTS	NITE	NIWC
Mean	1.56	0.42	0.94	0.02	-0.02	-0.16	-0.27
SD	1.35	0.18	0.83	0.30	0.96	0.44	1.26
Non-Disteressed							
Mean	2.43	0.54	1.64	0.23	0.26	0.15	0.45
SD	1.74	0.18	1.23	0.22	0.36	0.24	1.89

(source: IDX 2015-2019: data processed)

Table 3 reports summary statistics for the variables used in the study. The research sample is in liquid financial condition because the average ratio of current assets to current liabilities is above 1x for both conditions, even the ratio of current assets to total debt in distress conditions is almost 1x. On average, the sample firms maintain fairly well their current assets relative to their total assets. Though in general, it can be concluded that the performance of all financial ratios in non-distress situations looks better. And this descriptive analysis shows that the profitability ratio better describes the condition of the company in a dis tress situation.

3.2 Regression Results

Table 4 shows the results of logit regression analysis for financial ratios.:

Table 4. Regression Summary.

	B	Sig.	Exp(B)
Step 1[a] CACL	-.422	.031	.655
CATA	.933	.365	2.543
CATL	.141	.617	1.152
WCTA	5.433	.000	228.774
WCTS	-.230	.446	.794
NITE	13.968	.000	1164368.951
NIWC	.406	.012	1.500
Constant	.228	.650	1.256

5% significant level
(source: data proceed)

The final selected variables and related regression coefficient as shown in table 4 were used to derive the logistic regression function as follows:

$$\ln\left(\frac{pi}{1-pi}\right) = 0{,}228 - 0{,}422CACL_i + 0{,}933CATA_i + 0{,}141CATL_i - 5{,}433WCTAi - 0{,}230WCTSi + 13{,}968NITEi + 0{,}406NIWCi \quad (2)$$

The Sig column informs the significance of the influence of the independent variable on the dependent variable. If a 5% significance level is used, then the value of sig < 0.05 indicates that the independent variable (X) has a significant effect on the dependent variable (Y). From table 4, it appears that the variables that affect financial distress above can be explained that (y= 0, negative Net Income, CACL (sig 0,031), WCTA (sig 0,000), NITE (sig 0,000) and NIWC(sig 0,012).

Column Exp(B) informs the type of influence on the variables that have a significant effect. If the value is above one "1", it means that the risk is greater for y=1 (no loss) otherwise if the value is below one, it means that the risk is greater for y=0 (loss). The value of Exp(B) on the CACL variable (Current ratio) is 0.655, which means that the greater the value of CACL, if it is increased by one unit, it will result in the possibility of not losing to 0.655 times from before in the sense that the possibility of not losing is getting smaller or the possibility of loss is getting bigger if CACL goes up. The value of Exp(B) on WCTA is 228,774 which means that the greater the value of WCTA, if it is added by one unit, it will result in the possibility of not losing to 228,774 times from before in the sense that the possibility of not losing is getting bigger or the possibility of loss is getting smaller if X4 goes up. The value of Exp(B) on NITE is 1164368,951 which means that the greater the value of NITE, if it is increased by one unit, it will result in the possibility of not losing to 1164368,951 times from before in the sense that the possibility of not losing is getting bigger or the possibility of loss is getting smaller if NITE goes up. The value of Exp(B) on NIWC is 1,500 which means that the greater the value of NIWC, if it is added by one unit, will result in the possibility of not losing to 1,500 times from before in the sense that the possibility of not losing is getting bigger or the possibility of losing is getting smaller if NICW goes up.

Table 5. Classification Accuracy.

Observed		Predicted		
		y		Percentage Correct
		0	1	
Step 1	Y 0	77	44	63.6
	1	12	373	96.9
	Overall Percentage			88.9

a. The cut value is .500

From the Summary model table 5, it shows that (y=1, if not) logit model predicted the distressed firms as distressed with an accuracy rate of 63.6% and the healthy firms as healthy with an accuracy rate of 96.9% that corresponded to the overall accuracy rate of 88.9%. Reference [25] mentioned that NITE was also a good predictor, which is in contrast to the previous studies by [11] that NITE was not a strong predictor.

4. CONCLUSIONS

From the results obtained, it can be seen that not all ratios predicted equally well, profitability ratios were most significant in predicting a company's financial health. Our logit regression analysis has shown that CATA, CATL, WCTS were weak as a predictor financial distress, while CACL (liquidity), WCTA (liquidity), NITE (Profitability), NIWC (profitability) had a significant influence on financial distress, and the WCTA and NITE variables were very dominant in determining the contribution of the financial distress with the overall percentage of accuracy reaches 88.9%.

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