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Predicting Financial Distress of Small and Medium-Sized Entities

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Abstract:

Unhealthy financial conditions may be widespread and cause long-term distress, resulting in constraints on investment activities, capital flows, and performance of firms. Thus, it is critical for businesses to recognise the factors that can lead to organizational failure and take appropriate steps to avoid such a situation. The current study examines the measurement of financial distress among 53 small and medium enterprises (SMEs) in Malang over a two-year period (2018 and 2019). Financial ratios used as predictors are the ratios of Liquidity, Leverage to Asset, and Return on Asset (ROA). The sample was chosen based on the completeness of SMEs' financial data from 2018 to 2019. This study included 53 SMEs, the majority of which were culinary, fashion, and digital start-ups. The finding of 5% significance suggested that the model could be used to forecast financial problems of SMEs in Malang. The results of this investigation revealed that a company's financial stability, profitability, and debt have a significant effect on its ability to survive bankruptcy. R Square of 0.592 indicates the uncertainty which can be expressed by an independent variable to be 59.2%.

Keywords: Financial distress, bankruptcy prediction, SMEs, Malang Chamber of Commerce and Industry (KADIN)

1. Introduction

Small and Medium Enterprises (SMEs) play an important role in social inclusion and contribute significantly to Indonesia's economic growth. From job creation to poverty alleviation, Indonesian SMEs account for nearly 56 percent of business investment and 97 percent of domestic employment. As was stated by Yosina and Taghizadeh-Hesary (2018) that the role of SMEs in economy can be seen from: (1) their important role in economic activities in various industries, (2) their roles in the development of local economic activities, (3) their key roles in the creation of new markets and innovation sources, and (4) their role in maintaining the balance of payments through export activities.

Despite the great role of SMEs in the national economy, the sector is still struggling with basic problems. Generally, SMEs are still poor in business management skills, limited human resource productivity, poor access to finance and weak in penetration of the market (Pham, 2017), low human resource quality and low creativity (Geleta & Talegeta, 2019), and development inefficiency (Taiwo A et al, 2012). These problems confirm previous research which suggests that many SMEs have not been financeable, either due to lack of clear financial management, or lack of managerial and financial capability (ADB, 2015).

If SMEs have long-term financial difficulties and are unable to change their business operations, they will face difficulties in the tight competition. They will suffer losses which, in turn, will lead to bankruptcy (financial distress). According to Platt and Platt (2006), financial distress is a stage of financial decline that occurs before bankruptcy or liquidation. If the issue is not addressed quickly, it will have a detrimental impact on companies, including a loss of reputation and eventual bankruptcy.

According to Luciana (2003), a business is categorized as suffering financial distress if it has a negative operating profit for two consecutive years. A corporation that has obtained a negative operating result for more than a year indicates that the financial position of the organization has deteriorated. If the company management does not take any corrective actions, the company may experience bankruptcy. Companies with financial difficulties typically have a low profitability ratio. Meanwhile, the liquidity ratio of a company in financial distress is normally less than one, indicating that the company's current assets are insufficient to cover its total liabilities. In most cases, the equity ratio of a company in financial distress is greater than one, indicating that the company's debt exceeds its total assets.

External factors, such as clients, auditors, vendors, the government, and business representatives, are also used to predict a firm's financial potential. External parties usually respond to distress signals including late deliveries, poor product quality, a lack of customer confidence, and unpaid bank or creditor bills. An examination of financial statements and the computation of financial ratios can be used to determine whether or not a company is in trouble. These financial

ratios are used to forecast financial distress. Altman (2008, p.239) employs general ratios such as profitability, liquidity, debt, and cash flow.

Furthermore, the latest pandemic Covid-19, which has been ongoing since 2019, initiated the idea to undertake this study. Many companies have suffered as a result of the pandemic; some firms have gone bankrupt due to inability to repay loans, have been declared insolvent, and so on. The goal of this research is to look at financial ratios and see if they can predict financial distress in Malang SMEs. In this analysis, the liquidity ratio of the Current Ratio (CR), the leverage ratio of the Debt to Asset Ratio (DAR), and the profitability ratio of Return on Asset Ratio (ROA) are used as predictors of financial distress. The structure of this paper is as follows. Section 2 reviews the literature on the financial ratio used to forecast the financial distress of SMEs in Malang, as well as the conceptual context. The research methodology is defined in Section 3 along with the hypotheses. The regression results are outlined in Section 4. Finally, the article summarizes the findings and discusses the consequences for SMEs, future studies, and investors.

2. Literature Review & Hypotheses

The prediction of corporate financial crisis and bankruptcy has piqued the interest of researchers since the late 1960s. Financial analysts and investors, in general, use financial ratios to analyze distressed or bankruptcy situations in order to classify them. These ratios consider profitability, liquidity, and leverage. Financial distress occurs when a company is unable to meet its financial obligations to creditors. When a company's fixed costs are heavy, assets are illiquid, or sales are too vulnerable to economic downturns, the risks of causing financial distress increase.

According to Wruck in Sari (2005), financial distress is a decline in profitability (income) while Elloumi and Gueyie in Sari (2005) categorize firms as experiencing financial distress if they have had negative operating results for two consecutive years. Financial distress, according to Platt in Luciana (2004), is a period of deterioration in financial conditions preceding bankruptcy or liquidation. According to Platt in Luciana (2004), companies suffering financial hardship have the following conditions: (1) multiple years of negative recurring net income; (2) an end to dividend payment; and (3) a substantial turnaround or termination of business. These signs indicate that a company is in financial trouble. If it is not properly managed, the company will go bankrupt.

When a company experiences consistent operating losses that result in a capital deficit, financial uncertainty develops. In general, profitability, liquidity, and debt measures can be used as key indicators to assess financial distress. According to Hendra (2009), profitability is a useful metric for assessing how effective management or executives are at generating revenue. The profitability ratio evaluates a company's ability to make money at a certain amount of revenue, assets, and equity capital.

Return on Asset (ROA) is a ratio of profitability that can be directly applied to a company's asset (Keown, 2008, p.88). The greater the loss, the more likely it is that a company will face financial difficulties. According to Aisyah et al (2017), profitability (as measured by ROA) has a positive impact on financial distress. Setiawan and Widarjo (2009), on the other hand, discovered that profitability has a negative impact on financial distress. Fatmawati and Rihardjo (2017) discovered similar results in their research. When a company's operating margins are very poor, it is more likely to face financial difficulties. The following hypothesis has been established based on the above description.

- H1: The higher the profitability, the lower the risk of a company to suffer the financial distress is.

Liquidity ratios are used to determine the status of a credit facility. They typically represent the extent to which they are able to meet their short-term commitments. The risk of the company experiencing financial difficulties is reduced if it is able to manage and pay off its short-term obligations properly. The current ratio is a financial liquidity metric that compares a company's current assets to current liabilities in order to determine if it has enough cash to cover its bills for the next 12 months. There is no definite rule stating whether the current ratio norm is good or whether it must be maintained by an entity, because it is highly dependent on the type of business that the company engages in (Lukman, 2004, p.44). Companies in cyclical industries, for example, can maintain a higher current ratio to remain afloat during downturns (Ali, 2008; Mahmood et al, 2009).

Debt repayment is much easier for businesses with positive net working capital (Rahmadani et al, 2014). The risk of financial distress is reduced if businesses can adequately finance and repay their short-term obligations. The current ratio, which also assesses liquidity, has been shown to have a negative impact on financial distress (Widhiari and Merkusiwati, 2015; Santoso, 2017; Hidayat and Meiranto, 2018). Based on the above descriptions, the following hypothesis can be established.

- H2: The higher the liquidity, the smaller the probability of the company to experience the financial distress is.

The leverage ratio of a company is used to determine its ability to meet financial obligations (Kasmir, 2008, p. 113). The higher the ratio, the more leveraged the company is and the greater its financial risk (Toto, 2008, p.91). According to Lenox et al in Pasaribu (2008), bankruptcies are more likely to occur during default periods, and the higher the debt volume, the greater the risk of financial distress. The debt ratio is the proportion of a company's assets that are financed with debt. When a company borrows more money to finance its operations, the risk of financial difficulty increases. If this problem is not adequately handled, the risk of financial distress increases dramatically.

Leverage has a positive and statistically significant effect on financial distress (Fatmawati and Rihardjo, 2017; Simanjuntak et al 2017), indicating that the higher the leverage ratio, the greater the risk of financial distress for a business. According to Hidayat and Meiranto (2018), companies with higher debt levels are more likely to experience the financial distress. The following hypothesis can be drawn based on the above description.

- H3: The higher the leverage, the greater the probability of a company to experience financial distress is.

3. Research Methodology

This research is classified as causative since it examines the characteristics of a cause-and-effect relationship between two or more variables. The aim of this research is to better understand the effects of Profitability (X1), Liquidity (X2) and Leverage (X3) as independent variables on financial distress (Y) of SMEs in Malang a dependent variable.

3.1. Data

Data was obtained from SMEs members of the Chamber of Commerce and Industry Malang in the form of financial reports, publications in the mass media and other sources relevant to the research objectives. The sample for this analysis was chosen based on the completeness of SMEs' financial data from 2017 to 2018. The study involved 53 SMEs which were mostly culinary, fashion, and digital start-ups.

3.2. Dependent Variable (Y)

The dependent variable (Y) in this study is financial distress. The year of the company's financial distress will be the year of the variable period X and a year after the variable period X. This variable uses a dummy variable for the measurement:

Financial Distress = 1 (one)

Non-Financial Distress = 0 (zero)

3.3. Independent Variable (X)

a. Profitability (X1)

Profitability is measured using Return on Assets, which was calculated using the following formula:

$$\text{ReturnonAsset} = \frac{\text{Earnings After Tax}}{\text{TotalAsset}}$$

b. Liquidity (X2)

Liquidity is measured using the Current Ratio, which was calculated using the following formula:

$$\text{Current Asset Ratio} = \frac{\text{CurrentAsset}}{\text{Current Liability}}$$

c. Leverage (X3)

Leverage is measured using the Debt to Asset Ratio, which was calculated using the following formula:

$$\text{DebttoAssetRatio} = \frac{\text{Total Debt}}{\text{Total Asset}}$$

3.4. Data Analysis Technique

3.4.1. Logistic Regression Analysis Model

The purpose of this research is to determine how an independent variable influences the dependent variable. The logistic regression analysis is used to estimate the effect of the dependent variable on the independent variable. The model of analysis is as follows:

$$\text{Ln} \frac{P}{(1-P)} = a + b_1 \text{PROF} + b_2 \text{LIQUID} + b_3 \text{LEV} + \epsilon$$

Notes:

$\text{Ln} \frac{P}{(1-P)}$ = Log from the comparison between financial distress opportunities and non financial distress opportunities

a = constant

b_1 = Coefficient regression of profitability

b_2 = Coefficient regression of liquidity

b_3 = Coefficient regression of leverage

ϵ = Error

3.4.2. Steps of Analysis

- The precision of the test value, as determined by the Chi-Square value at the bottom of the Hosmer and Lemeshow test, should indicate a likelihood value > 0.05, indicating that the expected and observed classifications are not significantly different. This suggests that the logistic regression model is worthy of further investigation.
- Assessing the total model (overall model fit): from -2 log numbers where at start (Block number = 0) -2 log likelihood numbers must decrease at block number = 1. A decrease in logistic regression's probability suggests a stronger regression model.

3.4.3. Hypothesis Testing

This test helps to partially test the effect of an independent variable on the dependent variable by assuming the other variables are stable. This is obtained through the following formula:

$$t = \frac{\beta n}{S\beta n}$$

Notes:

B_n : The regression coefficient of a variable

S_{Bn} : Standard deviation of a variable

The results of testing the t-statistic with a significance standard of $\alpha = 5\%$ are:

- If significance $< \alpha$, then H₀ will be accepted and H_a will be rejected. This means that the independent variable have no partial impact on the dependent variable in any way.
- If sig. $\geq \alpha$, then H₀ will be rejected and H_a will be accepted. This indicates that the independent and dependent variable have a partial effect on one another.

4. Research Findings & Discussion

4.1. Research Findings

4.1.1. Definition of Statistics

There were 53 samples used in this study, which were collected between 2017 and 2018. There were six firms suffering financial distress in 2017, and seven in 2018. Meanwhile, the average profitability of SMEs was 2.19 per cent in 2017 and 4.6 per cent in 2018. The total liquidity of the SMEs was 1.34 in 2017 and 1.39 in 2018. The liquidity of the SMEs can be said to be very strong since it is above 1. The SMEs leverage was 0.64 in 2017 and 0.65 in 2018. Leverage of more than 60% is considered extremely risky; if the company is unable to generate a sufficient profit from its debt, it may go bankrupt.

4.1.2. Logistic Regression Analysis

4.1.2.1. Logistic Regression Model

According to the Hosmer-Lemeshow test results (Table 1), the Chi Square value is 1.182 with a sig value of 0.997, indicating that the significant value is greater than the alpha value (0.05). Thus, this is a good starting point to do further research with the model. Chi-square can be used to measure profitability, liquidity, and debt.

Step	Chi-square	df.	Sig.
1	1.182	8	0.997

Table 1: The Hosmer-Lemeshow Test

4.1.2.2. Overall Model Fit Test

To see if the additional independent variables made a substantial difference in the model, the -2 Log L statistic was used. The value of -2 Log Likelihood is 170.030 in Block Number = 0 (Beginning Block), the first model with no independent variables and only constant. Block Number 0 has a value of 170.030 in Tables 2 and 3, while Block Number 1 has a value of 88.801. As a result, this regression model can be claimed to be applicable.

Iteration		-2 Log Likelihood	Coefficient Constant
Step	1	171.827	-1.304
	2	170.039	-1.540
	3	170.030	-1.558
	4	170.030	-1.558

Table 2: Block 0: Beginning Block

Iteration History^{a, B, C}

a. The Model Includes A Constant.

b. The Initial -2log Likelihood Is 170.030

c. Since The Parameter Estimates Had Improved by Less Than 0.001 after Iteration 4, the Calculation Was Stopped

Iteration	-2 Log likelihood	Coefficients			
		Constant	Profitability	Liquidity	Leverage
Step1	118.809	-2.549	-0.024	-0.098	2.043
2	97.004	-3.691	-0.043	-0.374	3.485
3	89.932	-4.614	-0.065	-0.672	4.861
4	88.835	-5.229	-0.079	-0.812	5.697
5	88.801	-5.380	-0.081	-0.834	5.883
6	88.801	-5.387	-0.082	-0.835	5.891
7	88.801	-5.387	-0.082	-0.835	5.891

Table 3: Block 1: Method

- IterationHistory^{a,b,c}
- Method: Enter
- The model included a constant.
- The initial -2 Log Likelihood is 170.030
- The estimation was terminated after iteration7 because the parameter estimates changed by less than 0.001.

4.1.2.3. Logistic Regression Analysis

To test all hypotheses on all variables (including profitability, liquidity, and leverage), a logistic regression analysis was used to analyze all hypothesis. The test results are presented in the table below:

	B	S.E.	Wald	df.	Sig.	Exp.(B)
Step 1: Profitability	-0.082	0.030	7.167	1	0.007	0.922
Liquidity	-0.835	0.542	2.374	1	0.123	0.434
Leverage	5.891	1.389	17.995	1	0.000	361.631
Constant	-5.387	1.427	14.240	1	0.000	0.005

Table 4: Results of Logistic Regression Analysis
Variables in the Equation

a. Variable(S) Entered On Step 1: Profitability, Liquidity and Leverage.

$$Y = -5.387 + (-0.082) X_1 + (-0.835) X_2 + 5.891 X_3$$

The following is an explanation of the results of these tests:

4.1.2.3.1. Constant (a)

If the independent variables of profitability, liquidity, and debt are withdrawn from the logistic regression, a constant of -5,387 means that the risk of financial distress is reduced by 5,387.

4.1.2.3.2. Coefficient of Regression X1

The profitability variable (X1) has a regression coefficient of -0.082, meaning that if profitability increases by one unit, the possibility of financial distress (Y) reduces by 0.082, assuming all other variables remain constant.

4.1.2.3.3. Coefficient of Regression X2

The regression coefficient for the liquidity variable (X2) is -0.835, meaning that if the liquidity variable increases by one unit, the risk of financial distress (Y) decreases by 0.835, assuming that all other variables remain constant.

4.1.2.3.4. Coefficient of Regression X3

The leverage variable (X3) has a regression coefficient of 5.981, implying that if the leverage variable increases by one unit, the likelihood of financial distress (Y) increases by 5.981, assuming all other variables remain constant.

4.1.2.4. Qualification Matrix

The qualification matrix demonstrates the regression model's predictive capacity to estimate the likelihood of a company experiencing financial distress. According to Table 5, there are 32 companies in financial distress according to predictions, but actual results show that there are only 18 companies in financial distress. This model is correct to the tune of 18/32 or 56.3 percent. According to the forecasts, 48 businesses will avoid financial distress. Nonetheless, the results show that 46 businesses are not in financial distress. Thus, this formula is accurate to the tune of 46/48 or 95.8 percent.

Observed			Predicted		
Step 1	Distress	Non Fin.	Non Fin. Distress	Financial Distress	Percentage Correct
		Distress	46	5	95.8
	Overall %	Financial Distress	14	18	56.3
					89.1

Table5: Qualification Matriks

4.1.2.5. The Determination Coefficient Test

With an R-Square of 0.592, the independent variables will express 59.2 percent of the dependent variable's volatility. The remaining of 40.8 percent is due to various factors not included in the model. Profitability, liquidity, and debt are all factors that contribute to 59.2 percent prediction of financial distress.

Step	-2 Log likelihood	Cox & Snell R Square	R Square
1	88.801 ^a	0.357	0.592

Table 6: The Determination Coefficient

- The calculation was stopped after iteration 7 because the parameter values had changed by less than 0.001.

4.1.3. Hypothesis Test

- Hypothesis 1: The higher the profitability, the lower the risk of a company to suffer financial distress is. When profitability is $0.007 < 0.05$, profitability has a significant impact on predicting financial instability. The Wald test indicates a value of 7.167, which is greater than the 3.841 indicated by X2 table df. 1. This suggests that although H_0 is rejected, H_a is accepted, suggesting that profitability has a significant influence on financial distress.
- Hypothesis 2: The higher the liquidity, the smaller the probability of the company to experience the financial distress is.
- Liquidity has a significant impact on forecasting financial distress. The Wald test value is 2.374, which is less than the value of 3.841 in X2 table df. 1. It also has a significance level of 0.123, which is greater than 0.05. This implies that H_0 is accepted while H_a is not, implying that liquidity has no influence on financial distress.
- Hypothesis 3: The higher the leverage, the greater the probability of the company to experience the financial distress is.

With a significance level of $0.000 < 0.05$, leverage has a significant influence on forecasting the financial distress. The Wald test value of 17.995 is higher than the 3.841 value in the X2 table df. 1. This suggests that H_0 is rejected while H_a is accepted, implying that leverage has a significant influence on financial distress.

4.2. Discussion

The discussion in this section is intended to clarify the research findings in relation to the research objectives:

4.2.1. Profitability

Profitability is thought to have a significant and negative influence on predicting financial distress, with a significance value of $0.007 < 0.05$ and a Wald test value of 7.167, which is higher than the X2 table df. 1 value of 3.841. The findings of this study are consistent with those of Luciana's 2006 study and Salehi's 2009 study, both of which demonstrated that profitability can be used to predict financial distress. Financially distressed SMEs typically have negative profitabilities. Profitability demonstrates the quality and efficacy of the use of assets to produce income for the business. Negative profitability means inefficient use of the company's assets to generate net income, so if profitability starts to decline and becomes unfavorable, the likelihood of the company going bankrupt increases.

4.2.2. Liquidity

According to logistic regression analysis, liquidity has no influence on forecasting financial distress. The findings of these studies show that liquidity has no significant and negative influence in predicting financial distress, with a value of 2.374, which is lower than the value of 3.841 in X2 table df. 1. This research backs up Wahyu's (2009) findings that liquidity has no impact on forecasting financial distress and that there is no discernible difference in liquidity between financial and non-financial distressed firms.

4.2.3. Leverage

Logistic regression indicates that leverage has a major impact on the evaluation of financial distress, with a significance value of $0.000 < 0.05$ and a Wald test value of 17.995, which is greater than the X2 table df 1 value of 3.841. The findings of this study agree with those of Luciana (2006), Pasaribu (2008), and Salehi (2009), who all came to the same conclusion that leverage can be used to assess financial distress. In most situations, a company's net debt equals or

exceeds its total assets, but certain companies have more liabilities than assets. The average debt-to-asset ratio rises when debt exceeds net assets.

5. Conclusions

The goal of this study was to identify variables that could be used to predict financial distress of SMEs in Malang. The findings of this analysis are consistent with previous studies, which found that profitability, as measured by Return on Assets (ROA), has a negative and significant impact on predicting financial distress among SMEs in Malang, whereas leverage, as measured by Debt to Assets (DTA), has a positive and significant impact. Meanwhile, the liquidity provided by the Current Asset Ratio (CR) has little impact on SMEs' financial distress forecasting in Malang. Based on the findings, it is proposed that for small and medium-sized businesses, this study can be used to think about taking preventative measures before experiencing serious financial hardship and declaring bankruptcy.

However, this study has some weaknesses as a result of the restricted financial data obtained from SMEs. The study focused solely on financial data from the previous two consecutive years and some of them is not complete. As a result, the forecast model analysis is still unable to fully explain financial ratios reflected in the financial report in a good way to predict SMEs' financial distress. In addition, this analysis only looked at one criterion for determining financial distress, namely negative operating profit for two consecutive years.

Future research could look at financial distress through a variety of lenses, such as interest payout ratios, book value of equity, cash flow and so on. Instead of using non-financial data for a longer observation period, financial ratios can be measured using data from the balance sheet, profit and loss statement, and cash flows. With the right financial distress assessment mechanism, supported by reliable financial data, the findings of this study would be very useful for SMEs to take corrective steps to prevent bankruptcies.

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