

Measuring Manufacturing Industry in Indonesia: Z Score Model of Financial Distress Approach

Ahmad Rizal Solihudin

Universitas Ahmad Dahlan

Abstract: This study aims to analyze the influence of cash flow, profitability and sales growth on the potential for bankruptcy in the manufacturing companies of multi-industrial sector listed on the Indonesia stock exchange. The variables mentioned in this study are cash flow proxied by the ratio of operating cash flows to current liabilities, profitability is proxied by Return on Assets, sales growth is proxied by increased sales and the potential for bankruptcy is proxied by the Altman Z-Score method.

This research used secondary data types. The research population was 53 companies including various industrial sector manufacturing companies listed on the Indonesia Stock Exchange during 2018-2020 period. The sample selection was purposive sampling method, so that the number of samples in this study were 21 companies with a total of 63 observational data. Data collection techniques used document observation.

The data analysis technique used in this study was multiple regression panel data using the EViews application. Based on hypothesis testing using Partial Test (t), it is concluded that cash flow proxied by the ratio of operating cash flows to current liabilities (AKO), and profitability proxied by Return on Assets (ROA) both have a positive and significant effect on the potential for bankruptcy. Meanwhile, sales growth has no effect on the potential for bankruptcy.

Keywords: cash flow; profitability; sales growth; bankruptcy

I. INTRODUCTION

Economic activity has slowed as a result of the COVID-19 pandemic. This condition makes it very possible for many businesses to suffer large losses, even to the point of bankruptcy. The Altman Z-Score method is used in this study to assess the likelihood of bankruptcy. This is, according to Manzanque & Merino (2019), Altman developed this method to address the shortcomings of univariate analysis in predicting company failure. As a result, the "Z-score Model," a multivariate statistical technique, can be used to predict and estimate a company's failure.

In this study, cash flow ratios, profitability ratios, and sales growth ratios were used to predict the likelihood of bankruptcy. These ratios are thought to be capable of describing financial performance and efficiency in general, as well as forecasting the occurrence of potential bankruptcy (Pangkey & Maramis, 2018). The first indicator is the cash flow-to-current-liability ratio, which is proxied by operating cash flows. According to PSAK No. 2 Revised 2014, cash flow is an investment that has a very liquid nature, is short term, and can be quickly converted into cash in a certain amount without the risk of irregular value changes.

The second indicator in this study is the profitability ratio, which is proxied by Return on Assets (ROA), which is the ability to show the total assets used in the company for operating purposes in order to provide benefits to the company (Brigham & Houston, 2014). The sales growth ratio, which is a company's ability to describe the increase in sales growth, is the next research indicator. Whereas as the level of sales increases, so does the company's income, reducing the possibility of the company entering a state of bankruptcy (Pranowo, 2010).

Possibility of Bankruptcy

According to John & Ogechukwu (2018), financial distress is a condition that occurs when a company is in a financial crisis and faces bankruptcy. The Altman Z-Score method is used to calculate the bankruptcy potential variable in this study. According to Kristanti (2019), Altman developed this method to address the shortcomings of univariate

analysis in predicting company failure. As a result, the "Z-score Model" is a multivariate statistical technique that can be used to predict and estimate a company's failure.

Operating Cash Flow

According to Jumingan (2014), if cash is a high-liquidity asset or one of the parts of capital with the highest liquidity, increasing the amount of cash obtained by the company will increase the level of liquidity. Meanwhile, according to PSAK No. 2 (Revised 2014), a cash flow statement is a report that contains information about an entity's cash flows (inflows and outflows) and cash equivalents during a specific period. The cash flow ratio used in this study is operating cash flow to current liabilities, or abbreviated. This is because if a company can meet its funding requirements and pay off its short-term obligations on time, the likelihood of bankruptcy (distress zone) is reduced.

Return on Asset

Financial performance can affect the company's sustainability (Velasques, 2012). According to Kasmir (2013), profitability is a ratio used to assess a company's ability to seek profit or profit over a specific time period. Profitability is said to be in good shape if the company can meet predetermined profit targets by optimizing the assets or capital at its disposal. Profitability evaluation the ratio used in this study is Return on Assets (ROA). Whereas this ratio can be used to assess a company's ability to profit from its assets (profit). This means that this ratio is used to calculate the rate of return on investments. As a result, the ROA value rises in tandem with the profit (profit obtained). It can be interpreted that the more effective a company is at using assets to increase profits, the less likely the company is to go bankrupt (distress zone).

Sales Growth

The liquidity health of a business can has an effect on its performance and sustainability (Subramayam, 2010). According to Fahmi (2012), the growth ratio is a ratio that can be used to measure a company's ability to maintain its position in the industry and during economic development in general. Saunders & Cornett (2014) proposes that sales growth is a growth ratio comprised of increased sales, increased net income, increased dividends per share, and earnings per share. In this study, sales growth is measured by an increase in sales, which means that if the value of sales growth is higher, the profit will also be higher, so that if sales growth is high, the likelihood of the company experiencing bankruptcy (distress zone) is lower.

Hypothesis

H1: Cash Flow has a positive effect on the potential for bankruptcy

H2: Profitability has a positive effect on the potential for bankruptcy

H3: Sales Growth has a positive effect on the potential for bankruptcy

II. METHODS

This study's population consists of manufacturing companies from various industrial sectors that are listed on the Indonesia Stock Exchange for the 2018-2020 period. Purposive sampling was used in this study, which restricts the object of research to specific criteria. The data used in this study is secondary. The multiple regression analysis was used to analyze the data. The method of observation was used to collect data in this study. This technique is carried out by examining the data contained in annual financial statements and other data sources. Multiple regression panel data analysis was conducted to handle mixed data comprising of cross-sectional and time-series data. The panel data regression equation used in this investigation takes the following form:

$$\text{FINDIST} = a_0 + \beta_1 \text{OCFit} + \beta_2 \text{ROAit} + \beta_3 \text{SGit} + \varepsilon_{it}$$

Information:

FINDIST	: ZScore	OCF	: Operating Cash Flow
a ₀	: Constanta	ROA	: Return on Assets
β ₁ , β ₂ , β ₃	: Regression Coefficient	SG	: Sales Growth

Operational Variables

1. Altman Z Score

Altman et al. (2019) investigated the variables and samples used to generate the method of financial distress and bankruptcy. The method he devised is still being refined. The revision made by Altman is an adjustment made so that this bankruptcy prediction method can be applied to companies in other sectors, including banking, in addition to manufacturing companies that go public. One of the variables in the old method was changed. Because private companies do not have a market price for their equity, Altman changed the Market Value of Equity numerator in X4 to Book Value of Equity (Pangkey&Maramis, 2018).

$$Z = 1,2X1 + 1,4X2 + 3,3X3 + 0,6X4 + 0,999X5$$

Keterangan:

X1 = Working Capital to Total Assets

X2 = Retained Earnings to Total Assets

X3 = Earning Before Interest and Taxes to Total Assets

X4 = Market Value of Equity to Book Value of Total Liabilities

X5 = SalesCash flow

2. Cash Flow

The ratio of the company's operating cash flow to current liabilities can show the ability of the operating cash flow to pay off its current liabilities.

3. Profitability

Profitability ratio serves to assess the company's ability to seek profit or profit within a certain period. In this study, the profitability ratio is proxied by Return on Assets (ROA).

4. Sales Growth

Sales growth is a ratio that describes the percentage level of sales growth in a company.

III. RESULTS AND DISCUSSION

The descriptive statistics in Table 3 reflect the results of 63 units observations. The FINDIST ratio has a minimum value of 0.010 and a maximum value of 5.370. Meanwhile, the average is 2.369 points, the median is 2.290 points, and the standard deviation is 0.965 points. Operating Cash Flow Ratio has a minimum value of -0.410 and a maximum value of 2.860. Meanwhile, the average value of 0.187, the median value of 0.120, and the standard deviation of 0.428 are all present. The Return on Assets (ROA) ratio ranges between -0.080 and 0.100. Meanwhile, the average value of 0.023, the median value of 0.030, and the standard deviation of 0.041 are all present. The Sales Growth Ratio has a minimum value of -0.550 and a maximum value of 3.750. While 0.049 is the average, 0.020 is the median, and 0.540 is the standard deviation.

Table 1 Descriptive Statistical Results

Variable	FINDIST	OCF	ROA	SG
C	2.369	0.187	0.023	0.049
OCF	2.290	0.120	0.030	0.020
ROA	5.370	2.860	0.100	3.750
SG	0.010	-0.410	-0.080	-0.550
Std. Dev	0.965	0.428	0.041	0.540
Observatoins	63	63	63	63

Table 2 Categorization of Companies Based on Z Score

Category	2018	2019	2020
Z < 1.81 = distress zone	4	5	7
1.81 < Z < 2.99 = grey zone	13	12	11
Z > 2.99 = safe zone	4	4	3

The results of the calculation of potential bankruptcy (Altman Z-Score) and the categorization of businesses experiencing potential bankruptcy are shown in Table 2. (Altman Z-Score). The calculation results show that there are 16 manufacturing companies in the various industrial sectors that are in the distress zone, 36 companies are in the gray zone and 11 companies are in the safe zone.

Table 3 Panel Data Regression Test Results

Variable	Coefficient	t score	Prob.
C	2.032	13.635	0.000
OCF	0.814	5.106	0.000
ROA	8.348	4.462	0.000
SG	-0.174	-1.410	0.164

Regression Result Model

$$FINDIST_{it} = 2.032 + 0.814 OCF_{it} + 8.348 ROA_{it} - 0.174 SG_{it} + \epsilon_{it}$$

The t test is used to determine whether or not a hypothesis is valid. The t-test was used to determine the effect of each independent variable on the potential of bankruptcy, specifically operating cash flow, return on assets (ROA), and sales growth. The t-table value is determined by examining the table of significance rates of 0.05 and degrees of freedom (df) = nk, in this case with n = 63 and k = 3. Thus, df = 63-3 = 60 can be obtained, indicating that the t-table value is 1.671.

1. The test results show that the Operating Cash Flow variable has a positive coefficient of 0.814. The results of the t-statistical test (t-count) are greater than the t-table value (5.106 > 1.671) and the probability value is 0.00 < 0.05. The conclusion drawn is to accept H1, which means that operating cash flow has a positive and significant effect on the potential for bankruptcy.
2. The test results show the Return On Assets (ROA) variable has a positive coefficient of 8.348. The results of the t-statistical test (t-count) are greater than the t-table value (4.462 > 1.671) and the probability value is 0.000 < 0.05. The conclusion drawn is to accept H2, which means Return On Assets (ROA) has a positive and significant effect on the potential for bankruptcy.
3. The test results show that the Sales Growth variable has a negative coefficient of -0.174. The results of the t-statistical test (t-count) are smaller than the t-table value (- |1.410| < 1.671), and the probability value is 0.164 > 0.05. The conclusion drawn is to reject H3, which means that sales growth has no significant effect on the potential for bankruptcy.

Effects of Cash Flow on the Probability of Bankruptcy

The results indicate that the Operating Cash Flow variable has a positive and significant effect on the likelihood of bankruptcy, such that as the cash flow value increases, the likelihood of bankruptcy as measured by the Z-Score value increases as well, where a lower Z-Score value indicates a lower likelihood of bankruptcy. Thus, the cash flow proxied by Operating Cash Flow has a positive and significant effect on the likelihood of bankruptcy, implying acceptance of the first hypothesis. This means that if Operating Cash Flow in this study demonstrates the ability of the company's operating cash flow to meet its current obligations, the company's performance is considered to be satisfactory. Thus, as the operating cash flow ratio to current liabilities value increases, the company's potential for bankruptcy as measured by the Z-Score value increases as well, with an increasing Z-Score value indicating a lower potential for bankruptcy.

In contrast, if the operating cash flow ratio to current liabilities is low, the company's potential for bankruptcy as measured by the Z-Score value will also decrease, where a lower Z-Score value indicates a greater likelihood of bankruptcy. This is also supported by Ramadhani&Nisa (2019) research, which indicates that the higher the cash flow value, the less likely one is to encounter financial distress. However, the findings of this study contradict those of Harto&Saidah (2020), who discovered that the cash flow ratio, as measured by the ratio of cash flow to current liabilities, had no significant effect on predicting financial distress.

Profitability and the Risk of Bankruptcy

The results indicate that profitability, as measured by Return on Assets (ROA), has a positive and significant effect on the likelihood of bankruptcy, implying that as the value of cash flows increases, the likelihood of bankruptcy as measured by the Z-Score value increases as well, where an increase in the Z-Score value is interpreted as increasing the Z-value. Score's There is little risk of bankruptcy. Thus, the second hypothesis is accepted: the proxied profitability of Return On Assets (ROA) has a positive and significant effect on the likelihood of bankruptcy. The findings of this study

indicate that positive profits earned during a single accounting period can have an effect on the likelihood of bankruptcy. This means that as profit increases, the ROA increases as well. It can be interpreted that the more effectively a company uses assets to increase profits, the greater the company's potential for bankruptcy as measured by the Z-Score value, where a higher Z-Score value indicates a lower potential for bankruptcy.

On the other hand, the ROA decreases as profit decreases. It can be interpreted that the less effective a company is at utilizing assets to increase profits, the lower the company's potential for bankruptcy as measured by the Z-Score value, where a lower Z-Score value indicates a higher potential for bankruptcy. This is also reinforced by Setiawan (2017) research findings, which indicate that the higher the profitability, the less likely it is to experience financial distress. Pawitri & Altez (2020) found, however, that profitability as measured by return on assets (ROA) had no effect on financial distress.

The Effect of Increased Sales on the Probability of Bankruptcy

The findings indicated that sales growth had no effect on financial distress, thereby rejecting the third hypothesis. Sales growth that has slowed over time does not always indicate a poor cash flow running (operating cash flow) and profitability. The findings of this study corroborate those of Triwahyuningtias & Muharam (2012), who found that sales growth has no discernible effect on the prediction of financial distress.

IV. CONCLUSIONS

The test results indicate that cash flow, as measured by Operating Cash Flow, has a positive and significant effect on the likelihood of bankruptcy in a variety of industrial sector manufacturing companies listed on the Indonesian Stock Exchange between 2018 and 2020. Profitability, as measured by Return on Assets, has a positive and significant effect on the likelihood of bankruptcy of manufacturing enterprises in Indonesia's various industrial sectors. Meanwhile, the test demonstrates that there is no discernible influence on the possibility for bankruptcy of manufacturing firms in Indonesia's diverse industrial sectors in terms of sales growth.

REFERENCES

- [1.] Altman, E. L., Hotchkiss, E., & Wang, W. (2019). *Corporate Financial Distress, Restructuring, and Bankruptcy: Analyze Leveraged Finance, Distressed Debt, and Bankruptcy*. John Wiley & Sons.
- [2.] Brigham, E. F., & Houston, J. F. (2014). *Fundamentals of Financial Management*. South-Western Cengage Learning.
- [3.] Fahmi, Irham. (2012). *Analisis Laporan Keuangan*. Bandung: Alfa Beta.
- [4.] Harto, B., & Saidah Napisah, L. (2020). Analisis Pengaruh Model Laba dan Model Arus Kas dalam Memprediksi Kondisi Financial Distress. *JRAK (Jurnal Riset Akuntansi Dan Bisnis)*, 6(2), 100-108.
- [5.] John, A. J., & Ogechukwu, O. L. (2018). Corporate Governance and Financial Distress in the Banking Industry: Nigerian Experience. *Journal of Economics and Behavioral Studies*, 10(1), 182-193.
- [6.] Jumingan. (2014). *Analisis Laporan Keuangan*. Jakarta: PT. Bumi Aksara.
- [7.] Kasmir. 2013. *Analisis Laporan Keuangan Edisi 1*. Jakarta: Rajawali Pers.
- [8.] Kristanti, F. T. (2019). *Financial Distress Teori dan Perkembangannya Dalam Konteks Indonesia*. Inteligencia Media. Malang.
- [9.] Manzanegue, M., Priego, A. M., & Merino, E. (2016). Corporate Governance Effect on Financial Distress Likelihood: Evidence from Spain. *Revista de Contabilidad*, 19(1), 111-121.
- [10.] Pangkey, P. C., Saerang, I. S., & Maramis, J. B. (2018). Analisis Prediksi Kebangkrutan dengan Menggunakan Metode Altman dan Metode Zmijewski pada Perusahaan Bangkrut yang pernah Go Public di Bursa Efek Indonesia. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi*, 6(4).
- [11.] Pawitri, A. I., & Altez, M. (2020). Analisis Pengaruh Likuiditas, Profitabilitas, Leverage, Operating Capacity, dan Biaya Agensi Manajerial terhadap Financial Distress. *Jurnal Fokus Manajemen Bisnis*, 10(2), 149-168.
- [12.] Prameswari, A., Yunita, I., & Azhari, M. (2018). Prediksi Kebangkrutan dengan Metode Altman Z-Score, Springate, dan Zmijewski pada Perusahaan Delisting di Bursa Efek Indonesia (BEI). *Jurnal Riset Akuntansi Kontemporer*, 10(1), 8-15.
- [13.] Pranowo, K. (2010). Determinant of Corporate Financial Distress in an Emerging Market Economy: Empirical Evidence from the Indonesian Stock Exchange 2004-2008. *International Research Journal of Finance and Economics*, 52, 80-88.

- [14.] Ramadhani, A., & Nisa, K. (2019). Pengaruh Operating Capacity, Sales Growth Dan Arus Kas Operasi Terhadap Financial Distress. *Jurnal Riset Keuangan dan Akuntansi*, 5(1).
- [15.] Saunders, A., & Cornett, M. M. (2014). *Financial Institution Management*. Mc Graw-Hill.
- [16.] Setiawan, A. (2017). Analisis Pengaruh Tingkat Kesehatan Bank terhadap Return on Asset. *Jurnal Analisa Akuntansi dan Perpajakan*, 1(2), 130-152.
- [17.] Subramanyam, K. R., & Wild, J. J. (2010). *Analisis Laporan Keuangan*. Salemba Empat.
- [18.] Triwahyuningtias, M., & Muharam, H. (2012). Analisis Pengaruh Struktur Kepemilikan, Ukuran Dewan, Komisaris Independen, Likuiditas, dan Leverage terhadap Terjadinya Kondisi Financial Distress: Studi pada Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia Tahun 2008- 2010. *Doctoral dissertation*, Universitas Diponegoro.
- [19.] Velasques, M. (2012). *Business Ethics*. Peasson.