



# Comparison Level of Financial Distress before and During the Covid-19 Pandemic in Indonesia

Ria Arisandi <sup>a\*</sup>, Agrianti Komalasari <sup>a</sup> and Tri Joko Prasetyo <sup>a</sup>

<sup>a</sup> Accounting Science, Faculty of Economics and Business, University of Lampung, Indonesia.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/AJEBA/2022/v22i23870

## **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/92906>

**Original Research Article**

**Received 18 August 2022**  
**Accepted 20 October 2022**  
**Published 25 October 2022**

## **ABSTRACT**

The purpose of this study was to determine the level of financial distress that occurred before and for the duration of the Covid-19 pandemic in manufacturing corporations on the Indonesia Stock Exchange. By performing an Altman z-score analysis using five ratios of working capital to total assets, retained earnings to total assets, earnings before interest and taxes to total assets, market value equity to book value of total debt, and sales to total assets. This study is a type of quantitative study that utilizes of secondary data. The data used in the financial statement of the main record board of manufacturing companies was for the period 2017- 2020. The research sample consists of 90 companies. The test was carried out using the Mann-Whitney U Test using the SPSS V.25 program. This study shows that there is no significant difference in the level of financial distress that occurred before and during the Covid-19 pandemic. The results of this study provide recommendation for further researchers, namely in measuring the level of financial distress, they can add or use other analyzes other than the Altman Z-Score. Future researchers can use a longer observation period, especially during the Covid-19 pandemic.

*Keywords: Financial distress; Altman Z-Score; Covid-19.*

## **1. INTRODUCTION**

At the end of 2019, a new virus known as coronavirus disease 2019 (Covid-19) emerged

that caused global problems throughout the world. The emergence of this virus has caused many things to happen in almost every country. One of them is the emergence of global

\*Corresponding author: E-mail: [riaarisandi8@gmail.com](mailto:riaarisandi8@gmail.com);

economic shocks in the government sector, private companies, macro and micro businesses, and education, health, and tourism sectors. This virus caused a decrease in revenue in every sector of the company, so some companies implemented operational restrictions, and activity shutdowns, and some companies lay off their employees. One of the companies affected is the manufacturing sector. Minister of Industry Agus Gumiwan Kartasasmita said that the Indonesian Manufacturing Purchasing Managers Index was under pressure at the end of the first quarter of 2020. The decline in production capacity by 50% was the cause of the increase in the Indonesian Manufacturing Purchasing Managers Index to 45.3 in March 2020. This decline is the worst level since the global financial crisis more than 10 years ago [1].

Since the Covid-19 outbreak, many companies are experiencing the inability or failure to maintain their business, resulting in bankruptcy. Bankruptcy is an event where the company can no longer manage the company properly due to financial difficulties [2]. By analyzing financial performance, companies can detect financial distress that has the potential bankrupt.

Financial distress is a condition in which a company experiences financial difficulties and cannot fulfill its obligations to creditors at maturity [3]. Financial distress is a situation where the company experiences financial difficulties which result in the company not being able to run the company's operations properly, this is an early sign of impending bankruptcy [4]. To determine the state of financial difficulties in this study using the Altman Z-score analysis. Altman Z-Score is a model used to predict financial distress. Altman Z-score has been proven as a tool for initiating bankruptcy of manufacturing companies [4]. Altman z-score model has five ratios with the following formula:

$$Z\text{-Score} = 1,2 X1 + 1,4 X2 + 3,3 X3 + 0,6 X4 + 0,999 X5$$

Information :

- Z = Bankruptcy Index
- X1 = Working Capital To Total Assets,
- X2 = Retained Earnings To Total Assets
- X3 = Earnings Before Interest And Taxes To Total Assets,
- X4 = Market Value of Equity to Book Value of Debt
- X5 = Sales To Total Assets

The criteria for assessing financial distress are if the z-score with a value of < 1.81 goes bankrupt, a company that has a value of 1.81 to 2.99 is in doubt, and a company with a value of > 2.99 means that the company is not bankrupt.

This research is based on signal theory and stakeholder theory, Signal theory is a company management activity to provide information to stakeholders regarding the company goals in achieving future goals [5]. Stakeholder theory is an idea of how a company can work in any business that will succeed in creating benefits for customers, employees, capital owners, and the wider community [6]. The use of signal theory and stakeholder theory in research aims to strengthen research in understanding how information about the company's goals is achieved or not in maintaining and improving the company's sustainability. When achieving company goals, stakeholders have a right to know the company's activities and decisions to achieve goals in achieving success. Therefore, in determining the viability of the company so as not to experience bankruptcy, the company needs to be transparent in conveying the true state of the company to stakeholders.

## 2. METEIRALS AND METHODS

### 2.1 Hypothesis

An early sign of financial distress is when a business entity no longer can pay off its obligations at a predetermined, income is no longer able to finance operational activities so that the business entity is unable to achieve its operational goals which result in the termination of the company's activities which have an effect on bankruptcy. For the duration of the Covid-19 pandemic, people experienced poverty caused by a decrease in people's purchasing strength. This decrease has an effect on the enterprise's sales decline, so the company has difficulty meeting operational costs and difficulties paying debts, resulting in increasing company financial distress. From this statement, the proposed hypothesis is as follows:

- H1a : The decrease in Z-score during the pandemic led to higher levels of financial distress
- H1b : The level of working capital to total assets during the pandemic decreased.
- H1c : The level of retained earnings to total assets during the pandemic has decreased

- H1d : There is a decrease in earnings before interest and taxes to total assets during the pandemic.
- H1e : The market value equity to book value of total debt during the pandemic has decreased.
- H1f : Sales to total assets during the pandemic decreased.

## 2.2 Methods

This study is quantitative research whose data is obtained from secondary data, in which the source of the data received comes from the Indonesia Stock Exchange (IDX) which is obtained through the website [www.idx.co.id](http://www.idx.co.id). The population used comes from manufacturing companies that have main board recording status, using financial reports for the period 2017 to 2019 earlier than the pandemic and in the course of the pandemic the usage of 2020 financial statements. The population used is 108 companies, consisting of manufacturing companies in the basic industrial sector 45, the consumer goods industry sector 36, and the miscellaneous industry sector 27. Purposive sampling is a method used in selecting research sample criteria. These criteria include manufacturing companies with the main listing status listed at the Indonesia Stock Exchange (IDX), the manufacturing business sector including the basic industrial sector, the consumer goods industry sector, and the various industrial sectors and manufacturing companies that publish complete financial reports during 2017, 2018, 2019 and 2020. So that the research sample used was 90 companies consisting of 36 basic industrial sectors, 31 consumer goods industrial sectors, and 23 miscellaneous industrial sectors. The variable in this study is financial distress, which is carried out using financial statement analysis using the Altman Z-score model analysis. Data analysis methods used include descriptive statistical analysis, normality test using the one-sample Kolmogorov Smirnov test method and hypothesis testing using the Mann Whitney test.

## 3. RESULTS AND DISCUSSION

### 3.1 Result

#### 3.1.1 Result descriptive statistical test

This study uses descriptive statistics that aim to provide a description of the data in the form of the lowest score, top score, average score, and

standard deviation score. It can be seen in the effects of the descriptive statistical analysis check inside the Table 1.

Descriptive statistical analysis test results of the test before and during the pandemic there was a decrease in average Altman z-score where before the pandemic was 4.627 and during the pandemic it was 3.620, meaning there was a decrease of 1.007. This decrease was due to a decrease in X1 level of working capital to total assets where before the pandemic the average value was 0.247 and during the pandemic of 0.246 there was a decrease of 0.001. The decrease also occurred in X2 of retained earnings to total assets, where before the pandemic the average value was 0.203 and during the pandemic of 0.142 there was a decrease of 0.061. X3 earnings before interest and taxes to total assets decreased before the pandemic average value was 0.270 and during the pandemic was 0.131 there was a decrease of 0.139. X4 The market price of fairness towards the book price of debt decreased before the pandemic the average value was 3.074 and during the pandemic, it was 2.324 there was a decrease of 0.75. And the decrease occurred in X5 sales of total assets where the decrease before the pandemic the average value was 0.927 and during the pandemic of 0.774 there was a decrease of 0.153.

#### 3.1.2 Result normality test

The normality takes a look at if the data finished on this examination used the one pattern Kolmogorov-Smirnov check to peer the extent of importance. The outcomes of the normality take a look at can be visible within the Table 2.

The results of normality testing that have been carried out in Table 2 can be seen that all data are not normally distributed, except for X1 level of working capital to total assets during the pandemic, which has normally distributed.

#### 3.1.3 Result hypothesis testing

The data in this examination were not normally distributed, so the Mann-Whitney U test was used for hypothesis testing. The results of hypothesis testing are in the following Table 3.

From Table 3 we can see that the difference test produces the whole hypothesis with a value of  $> 0.05$ , which means that all hypotheses are not supported.

**Table 1. Descriptive Statistics Before & During the Covid-19 Pandemic**

	<b>N</b>	<b>Low</b>	<b>Top</b>	<b>Average</b>	<b>Std.Deviation</b>
<b>Z-Score Before</b>	270	-13.468	41.327	4.627	5.856
<b>Z-Score During</b>	90	-7.427	25.713	3.620	4.484
<b>X1 Before</b>	270	-2.899	1.027	0.247	0.382
<b>X1 During</b>	90	-1.158	1.193	0.246	0.373
<b>X2 Before</b>	270	-6.158	1.154	0.203	0.828
<b>X2 During</b>	90	-6.971	1.121	0.142	1.145
<b>X3 Before</b>	270	-8.675	2.409	0.270	0.726
<b>X3 During</b>	90	-3.129	1.654	0.131	0.628
<b>X4 Before</b>	270	0.037	36.565	3.074	5.037
<b>X4 During</b>	90	0.032	23.081	2.324	3.428
<b>X5 Before</b>	270	0.020	3.102	0.927	0.489
<b>X5 During</b>	90	0.006	2.317	0.774	0.427

Source: SPSS V.25 Data Processing Results, 2022

**Table 2. One-Sample Kolmogorov-Smirnov Test**

	<b>N</b>	<b>Sig</b>	<b>Information</b>
<b>Z-Score Before</b>	270	0,000	Abnormal
<b>Z-Score During</b>	90	0,000	Abnormal
<b>X1 Before</b>	270	0,000	Abnormal
<b>X1 During</b>	90	0,072	Normal
<b>X2 Before</b>	270	0,000	Abnormal
<b>X2 During</b>	90	0,000	Abnormal
<b>X3 Before</b>	270	0,000	Abnormal
<b>X3 During</b>	90	0,000	Abnormal
<b>X4 Before</b>	270	0,000	Abnormal
<b>X4 During</b>	90	0,000	Abnormal
<b>X5 Before</b>	270	0,000	Abnormal
<b>X5 During</b>	90	0,007	Abnormal

Source: SPSS V.25 Data Processing Results, 2022

**Table 3. Different Test**

<b>Test Statistics</b>						
<b>Information</b>	<b>Z-Score</b>	<b>X1</b>	<b>X2</b>	<b>X3</b>	<b>X4</b>	<b>X5</b>
<b>Mann-Whitney U Test</b>	11384	11962	11689	10852	11898	11728
<b>Wilcoxon W</b>	15479	16057	48274	14947	15993	13823
<b>Z</b>	-0.896	-0.219	-0.539	-1.518	-0.294	-1.833
<b>Sig</b>	0.370	0.826	0.590	0.129	0.769	0.105
<b>Information</b>	<b>Not Supported</b>	<b>Not Supported</b>	<b>Not Supported</b>	<b>Not Supported</b>	<b>Not Supported</b>	<b>Not Supported</b>

Source: SPSS V.25 Data Processing Results, 2022

### 3.2 Discussion

From the test results of descriptive statistical analysis time pandemic, the average value has decreased where the ratio of working capital to total assets which is a liquidity ratio has decreased by 0.001, this decrease illustrates the small possibility that the company may experience difficulty in settling its short-term obligations, obligations caused by lack of current assets to cover short-term liabilities. In addition, a decrease in the average value of retained earnings to total assets, that's the profitability

ratio, has decreased by 0.061, meaning that there is a decrease in the company's performance in generating profits. The decrease in the average value also occurs in earnings before tax and interest to total of 0.139, meaning that there is a decrease in the company's operational ability to apply its property to generate income from assets before tax expense. The decrease in the average value also occurred inside the market value of equity to book value of debt of 0.75, meaning that there was a decrease in the organization's potential to satisfy any quick time period debt and long-term

debt with its capital. A decrease in the average value also occurred in sales of total assets of 0.153, meaning that management's ability to generate profits has decreased when facing the Covid-19 pandemic.

In testing the hypothesis on the stage of financial distress before and at some point of the Covid-19 pandemic, the results of the average significance value are  $\geq 0.05$ , which means that the hypothesis in this study is not supported. The Altman z-score calculation hypothesis H1a is 0.370, the speculation H1b working capital to total assets is 0.829, the speculation H1c is retained earnings to total assets is 0.590, H1d earnings before tax and interest to total assets is 0.129, H1e market value of equity to book value of debt is 0.769, H1f of sales to total assets is 0.105. From the effects of the exclusive assessments, it can be concluded that all the hypotheses in this study are not supported.

From the analysis and testing that has been carried out in this study to compare the level of financial difficulty before and during the covid-19 pandemic in manufacturing companies, the status of the main recording board which has been measured using the Altman Z-score method gives so that there is no difference in the level of financial difficulty before and during Covid-19 pandemic. The absence of this difference is due to an increase in demand for goods during the pandemic so that manufacturing companies can survive and increase. Sectors that experienced an increase during the pandemic included the pharmaceutical, food and beverage, household appliances, cement, and metal industries.

Companies that can survive or experience an increase during the Covid-19 pandemic, this is due to the corporation's capability to fulfill short-time period obligations during the pandemic, the company's long life in operation makes it smooth in profit accumulation, in addition to management's ability to manage profits, to face various situations have readiness. This is what makes a company still able to maintain its operations and even achieve improvements even in bed and slumped conditions.

The test results in this examination are consistent with research performed by [7] in their research there is no significant difference in the level of financial distress in manufacturing companies, as measured by the Zmijewski analysis tool.

In their research [8] in their research there was no significant difference in the level of financial distress in the research sample before and during the Covid-19 pandemic. Research [9] in their study did not have the influence of the Altman Z-score Model on the Share Prices in Manufacturing Companies on the Indonesia Stock Exchange Before and During the Covid-19 Pandemic. And previous research that supports this finding is research conducted by [10] in his research on the regarding the financial distress of transportation companies in Indonesia before and during the COVID-19 pandemic, it had no influence and differences in financial conditions, both before and during the Covid-19 pandemic. The manufacturing industry was able to survive and experience growth even under the pressure of a pandemic that hit almost all industries [11]. During the fourth quarter of 2020, the manufacturing industry has become the focus of industrial growth. The industries that experienced growth of 11.46% occurred in the base metal industry, 8.45% in pharmaceutical chemical and traditional medicine, 1.66% in food and beverage, and 2.91 cement industry. This growth has helped in the national economic recovery.

#### 4. CONCLUSION

In processing and analyzing the data in this study, using the Altman Z-score analysis it was found that before and all through the Covid-19 pandemic there was no significant difference in the level of financial difficulty in manufacturing companies, especially on the main recording board. The absence of this distinction was due to an increase in several sectors, including pharmaceuticals, food and beverages, family appliances, cement, and metals.

From the results of this study, the authors recommend that further researchers can use or add other analyzes in measuring the level of financial distress. The observation time during the covid-19 pandemic is only one year namely 2020, further researchers can use a longer observation period, especially during the covid-19 pandemic.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

1. Karunia AM. Corona Virus Causes Manufacturing Industry Performance to

- Slump Sharply all pages - Kompas.com. 2020. Accessed 15 September 2020. Available:<https://money.kompas.com/read/2020/04/03/070800326/virus-corona-sebabkan-kinerja-industri-manufaktur-merosot-tajam-?page=all>
2. Mohammed E, Abusalah A, Kim-soon N. Using Altman's Model and Current Ratio to Assess the Financial Status of Companies Quoted in the Malaysian Stock; 2012.
  3. Khaliq A, Motawe Altarturi BH, Mohd Thas Thaker H, Harun MY, Nahar N. Identifying Financial Distress Firms : A Case Study of Malaysia's Government Linked Companies (GLC). International Journal of Economic, Finance and Management ISSN 2307-246. 2014;3(3):141–150.
  4. Gamayuni RR. Analysis of the Accuracy of Altman's Model as a Tool for Predicting Bankruptcy (Empirical Study on Manufacturing Companies on the IDX). Scientific Journal Periodic Six Months ISSN 1410 – 1831. 2011;16(2):158–176.
  5. Brigham FE, Houston JF. Fundamentals of Financial Management. Salemba Four; 2010.
  6. Sutedi A. Good Corporate Governance. RayGraphics; 2012.
  7. Azizah AH, Prastiwi A. Analysis of Different Levels of Financial Distress Using the Zmijewski Method Before and During the Covid-19 Pandemic (Empirical Study of Companies Listed on the Indonesia Stock Exchange in 2019 and 2020); 2020.
  8. Putra MFF, Bhilawa L. Comparative Analysis of Financial Distress Levels Before and During the Covid-19 Pandemic Using the Altman Z-Score Model; 2022
  9. Anggraenya AD, Suryana A. The Effect of Bankruptcy Analysis on the Altman Z-score Model Against Stock Prices in Manufacturing Companies on the Exchange Effects of Indonesia Before and During the Covid-19 Pandemic (Study Case Year 2019-2020); 2022.
  10. Kumajas LI. Financial Distress Transportation Company in Indonesia Before and During the Covid-19 Pandemic. Journal of Information, Taxation, Accounting, and Public Finance. 2022;17 (1):19–38. Available:<https://doi.org/10.25105/jipak.v17i1.8698>
  11. RI Ministry of Industry. Ministry of Industry: The Industrial Sector is Still the Mainstay of National GDP. Ministry of Industry of the Republic of Indonesia. 2020. Accessed 7 August 2020. Available:<https://kemenperin.go.id/article/21922/Sector-Industri-Masih-Jadi-Andalan-PDB-Nasional>

© 2022 Arisandi et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*

*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle5.com/review-history/92906>