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Financial Distress Before and During the Covid-19 Pandemic and the Accuracy of the Prediction Model Used

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ABSTRACT

The recent COVID-19 pandemic had inflicted adverse impacts on the lives of throughout the world people, including Indonesia. From the perspective of the business sector, many companies were not spared, especially in terms of their financial performance. Many companies became bankrupt and had to go out of business although there were still some companies which managed to survive with all the limitations. This study was conducted to examine whether there were differences between financial distress conditions before and during the COVID-19 pandemic in primary consumer goods sector companies in Indonesia and to determine which measurement model is more accurate for calculating financial distress. The samples used in this study involved 42 primary consumer goods sector companies listed on the Indonesia Stock Exchange. Data were analyzed using the Wilcoxon Signed Rank test. The result of this study shows that there is no significant difference between financial distress conditions before and during the COVID-19 pandemic. This means that the COVID-19 pandemic will not make companies in the primary consumer goods sector falter because people will still look for primary goods such as food and clothing for their daily needs. People's purchasing power for primary needs remains high despite the pandemic. Springate and Zmijewski are the financial distress measurement models that are considered the most accurate with an accuracy rate of 88.69%. This study is expected to be an input for investors whether investing in consumer goods companies will be profitable or not under various conditions. Future research is expected to be able to test other financial distress measurement models for companies similar to this study or other types of companies.

Keywords: Financial Distress, Altman Z Score, Zmijewski, Springate, Ohlson, Taffler.

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INTRODUCTION

The COVID-19 pandemic that hit the world including Indonesia from the beginning of 2020 until today has had a significant impact on all business fields. The Indonesian government's policies on enforcing restrictions on community activities has had quite an impact on companies in carrying out their operational activities, which resulted in companies facing declining financial performance. It was inevitable that layoffs were happening everywhere as many people were trying to start new businesses to survive during a pandemic. As a result of the policy to impose restrictions on community activities, people started to shop for their daily needs via online services such as WhatsApp (messages and delivery) or through supermarket/minimarket applications, for example Yogya Online, Klik Indomart, AlfaGift, and so on. Even though on one hand there were many businesses that were dimmed when we entered the COVID-19 pandemic, on the other hand there were also businesses that started to shine. An example is the business of shipping goods as a result of changes in people's lifestyles since the pandemic, where most people had to resort to buying goods online due to the restrictions imposed on movement during the pandemic.

In Indonesia, a lot of businesses were run on selling daily necessities (food and clothing needs) through minimarkets or supermarkets in retail and wholesale form. One of them is Giant which is a supermarket chain originating from Malaysia. According to Sandi (2021), a significant number of shopping centers or malls were closed due to the COVID-19 pandemic. What was quite phenomenal was the closing of Giant. Furthermore, according to Idris (2021), PT Hero Supermarket Tbk as the owner has decided to close all Giant outlets in Indonesia by the end of July 2021. Giant outlets in Indonesia are spread across 80 locations. This decision was taken by the owner with the reason to focus on developing other outlets, namely IKEA, Guardian and Hero Supermarket. When entering Indonesia, Giant collaborated with PT Hero Supermarket Tbk to develop its business.

In this study, the researcher attempts to find out how much the pandemic had an impact on the company. Relate to the possible bankruptcy that that might occur in which signals obtained can act as early warnings, hence allowing stakeholders to take necessary actions before actual bankruptcy happens. There have been several previous studies that examined the financial distress of retail companies in Indonesia using different prediction models. The average of previous studies in the last 5 years (can be seen in table 1) used the Altman Z Score, Springate, and Zmijewski models. The results of the calculation of financial distress from each model for each company are different. Likewise, the level of accuracy of each model also varies between previous studies.

The researcher chose a retail company (primary consumer goods sector company) in this study because it refers to the phenomenon of the closure of one of the large supermarket outlets in Indonesia, namely Giant. Even though this supermarket does not belong to Indonesia, among Indonesian people, this supermarket is quite well known and in terms of the price offered it is not much different from Indonesian supermarkets. So far, Giant Supermarkets have become an alternative for people to shop for their daily needs at affordable prices. It could be said that most companies experienced a decline in performance and even closed during the pandemic, one of which was the consumer goods sector. On the other hand, there are also companies whose performance has improved during the pandemic. Thus, it is necessary to identify whether the pandemic has had a significant impact on the company

The novelty of this study is that the researcher uses the Ohlson and Taffler model which is rarely used in previous studies to examine financial distress in retail companies in Indonesia.

Tables 2 and 3 present previous studies using the Ohlson model and the Taffler model. The next novelty is that the researcher took the period before the COVID-19 pandemic, namely 2018 and 2019 and during the COVID-19 pandemic, namely 2020 and 2021. Seeing how important it is to know the condition of financial distress during the pandemic and its comparison with the pre-pandemic period and there is a research gap from previous research, the researchers conducted this study with the following objectives; 1)To identify the differences in financial distress before and during the COVID-19 pandemic in primary consumer goods sector companies in Indonesia using the Altman Z Score, Springate, Zmijewski, Ohlson, and Taffler models; 2) To identify the most accurate model used to predict financial distress.

LITERATURE RESEARCH

According to Effendi (2018), financial distress is a condition where a company is no longer able to run its business hence leading to bankruptcy. To anticipate this bankruptcy, the company needs to analyze the potential for bankruptcy through an analysis of the company's financial statements. There are various models that can be used as follows:

Altman Z Score Model

According to Nilasari & Haryanto (2018) , Altman's model uses the step-wise multiple discriminant analysis method or called MDA which is a statistical technique for creating models that produce linear equations that can distinguish between two dependent variable states. According to (Kurniawan et al., 2021), the Altman Z Score model can be calculated using the following equation:

$Z = 1.2X_1+1.4X_2+3.3X_3+0.6X_4+1.0X_5$

Where:
X_1 = Working Capital/Total Assets
X_2 = Retained Earnings/Total Assets
X_3 = Earnings Before Interest and Tax (EBIT)/Total Assets
X_4 = Stock Market Value/Total Debt
X_5 = Sales/Total Assets

The assessment criteria according to Melissa & Banjarnahor (2020) are if the score is > 2.99, then the company is said to be healthy. If the score is between 1.81 and 2.99 then the company is said to be vulnerable. If the score is <1.81, the company is said to have the potential to go bankrupt.

Springate Model

Muzanni & Yuliana (2021) state that the Springate model is a modification of the Multiple Discriminate Analysis (MDA) formula. Arini (2021) states that the concept of predicting financial distress with MDA is a combination of financial ratios into a predictive model using discriminant analysis. The Springate model is calculated by the following equation:

$S = 1.03\ X_1 + 3.07\ X_2 + 0.66\ X_3 + 0.4\ X_4$

Where:
$X1$ = Working Capital/Total Assets
$X2$ = Earnings Before Interest and Taxes/Total Assets
$X3$ = Earnings Before Taxes/Current Liabilities
$X4$ = Sales/Total Assets

The assessment criteria according to Effendi (2018) are S-Score > 0.862. This means that the condition of the company is not bankrupt. Conversely, if the S-Score < 0.862, it means that the company is experiencing bankruptcy

Zmijewski Model

Nilasari & Haryanto (2018) state that the Zmijewski model uses random sampling and logit regression techniques in its statistical methods. Effendi (2018) states that the Zmijewski model can be calculated with the following equation:

$X = -4.3 – 4.5X_1 + 5.7X_2 + 0.004X_3$

Where:
X_1 = ROA (Return on Asset)
X_2 = Leverage (Total Liabilities/Total Assets) or Debt Ratio
X_3 = Liquidity (Current Assets/Current Liabilities) or Current Ratio

The evaluation criteria for this model are that if the score obtained is greater than 0 then the company is predicted to go bankrupt and vice versa if the score obtained is less than 0 then the company is predicted not to experience potential bankruptcy.

Ohlson Model

According to Kartikasari & Hariyani (2019), Ohlson's model uses logistical analysis to develop a bankruptcy prediction model with nine independent indicators, calculated by the following equation:

$O = -1.32 – 0.407X_1 + 6.03X_2 – 1.43X_3 + 0.0757X_4 – 2.37X_5 – 1.83X_6 + 0.285X_7 – 1.72X_8 – 0.521X_9$

Where:
X_1 = Log (Total Assets/GNP index)
X_2 = Total Liabilities/Total Assets
X_3 = Working Capital/ Total Assets
X_4 = Current Liabilities/Current Assets
X_5 = 1 if Total Liabilities > Total Assets; 0 otherwise
X_6 = Net income/Total Assets
X_7 = Cash Flow from)peration/Total Liabilities
X_8 = 1 if Net Income is negative; 0 otherwise
X_9 = Changes in Net Income $(NI_t – NI_{t-1})/(NI_t + NI_{t-1})$

As mentioned by Piscestalia & Priyadi (2012), the Ohlson model was developed in 1980 by Ohlson to predict financial distress. The assessment criterion is if the score is <0.38, then the company is not experiencing financial distress. If score > 0.38. the company experiences financial distress.

Taffler Model

According to Masdiantini & Warasniasih (2020), the construction of the Taffler model is based on the Altman model. The Taffler model can be calculated with the following equation:

$Z_{Taffler} = 3.20 + 12.18X_1 + 2.50X_2 – 10.68X_3 + 0.0289X_4$

Where:
X_1 = Profit before Tax/Current Liabilities
X_2 = Current Assets/Total Liabilities
X_3 = Current Liabilities/Total Assets
X_4 = Net Profit after Tax/Total Assets

If the Taffler value is negative, it indicates that the company has the potential to go bankrupt. Conversely, if the Taffler value is positive, it indicates that the company has no potential for bankruptcy. If the Taffler value is greater than 0.3. then the risk of bankruptcy is low, but if the Taffler value is less than 0.2, then the risk of bankruptcy is high Widiasmara & Rahayu (2019). The following data is from previous studies that examined financial distress using several different calculation models for retail companies in Indonesia in the last 5 years.

Table 1
Studies on the Financial Distress of Retail Companies in Indonesia

Researcher	The Financial Distress Measurement Model Used	Results
Barry (2019)	Altman Z Score, Springate	There are four companies that are indicated to be going bankrupt
Hantono (2019)	Altman Z Score, Springate, Zmijewski	Each model has different financial distress assessment results
Huda et al (2019)	Altman Z Score, Springate, Zmijewski	There are four companies that are indicated to be in financial distress
Mandalurang et al (2019)	Altman Z Score, Springate, Zmijewski	There are nine companies that are indicated to be in financial distress
Melissa & Banjarnahor (2020)	Altman Z Score, Springate, Zmijewski	There were significant differences in the three models in predicting bankruptcy.
Muzanni & Yuliana, (2021)	Altman Z Score, Springate, Zmijewski	There were significant differences between the Altman model, Springate model, and Zmijewski model in Indonesian retail companies.
Nilasari & Haryanto (2018)	Altman Z Score, Springate, Zmijewski	The Altman and Zmijewski models can be used to predict financial distress in Retail companies. The most accurate model is the Zmijewski model.

Researcher	The Financial Distress Measurement Model Used	Results
Sari (2018)	Altman Z Score, Springate, Zmijewski	There are significant differences between the three models in predicting bankruptcy. Altman method has the highest accuracy rate of bankruptcy calculation, so the Altman method is the most effective method used to predict the potential bankruptcy.
Saragih & Dewi (2019)	Springate, Zmijewski	There is no significant difference between the Springate and Zmijewski methods in predicting retail company bankruptcy.
Silaen et al (2020)	Springate, Zmijewski	There was a company that have the potential to go bankrupt if calculated using the Springate method. Meanwhile, it falls into a gray area if calculated using the Altman method.
Kurniawan et al. (2021)	Altman Z Score	That companies with a high impact of the COVID-19 pandemic will be more predicted to go bankrupt, furthermore the cash position and debt ratio in 2019 have no moderating effect.

Based on table 1, there are 9 studies (in the last 5 years) that use the Altman Z-Score and Zmijewski models to examine financial distress in retail companies in Indonesia and there are 10 studies (in the last 5 years) that use the Springate model to examine financial distress in retail companies in Indonesia.

In this study, the researcher will add a financial distress calculation model using the Ohlson and Taffler model which is rarely used in previous research on retail companies in Indonesia. Following are previous studies that used the Ohlson model and the Taffler model in calculating financial distress in the last 5 years, namely:

Table 2
Financial Distress Studies Using the Ohlson Model

No.	Researcher	Research Subject
1	Widiasmara & Rahayu (2019)	9 industrial sectors listed on the IDX
2	Komarudin et al. (2019)	Mining companies in Indonesia
3	Lisin et al. (2022)	Companies in North America
4	Najib & Cahyaningdyah (2020)	Companies delisted in Indonesia from 2015 to 2019
5	Tanjung (2020)	Pharmaceutical companies in Indonesia
6	Elviani et al. (2020)	Trading sector companies
7	Indriyanti (2019)	Technology company listed in Forbes' 25 Biggest Technology Companies in the World 2015-2016
8	Imelda & Alodia (2017)	Manufacturing companies listed on the IDX
9	Piscestalia & Priyadi (2012)	Mining companies in Indonesia
10	Margali et al. (2017)	Paper and pulp companies in Indonesia

Table 3
Financial Distress Studies Using the Taffler Model

No.	Researcher	Research Subject
1	Widiasmara & Rahayu (2019)	9 industrial sectors listed on the IDX
2	Masdiantini & Warasniasih (2020)	Companies in the cosmetics and household goods sub-sector in Indonesia.
3	Indriyanti (2019)	Technology company listed in Forbes' 25 Biggest Technology Companies in the World 2015-2016
4	Vavrek et al. (2021)	Agricultural company in the Slovak Republic
5	Hájek et al. (2017)	Convection sector companies in Kazakhstan
6	Anugrah (2019)	Companies that were forcibly delisted in Indonesia in the 2010-2014 period
7	Arini (2021)	Global retail industry included in Kantar's 2019 Top 30 Global Retails (EUR)
8	Kusumaningrum (2021)	Global retail industry included in Kantar's 2020 Top 30 Global Retails (EUR)
9	Cattleyana et al. (2020)	BUMN in Indonesia
10	Fathonah et al. (2021)	Automotive companies in Indonesia

Based on table 2 and table 3, it can be concluded that most of the previous studies used the Ohlson model and the Taffler model to measure financial distress in companies other than retail companies. In other words, these two models are rarely used to measure financial distress in retail companies.

From the financial distress prediction models used, it is also necessary to see which one is considered to be more accurate or has a high accuracy value. Following are previous studies that examine the accuracy of the models used to predict financial distress.

Table 4
Studies on the Accuracy of Financial Distress Prediction Models in Retail Companies

No.	Researcher	Highest Accuracy Model	Research Subject
1	Kartikasari & Hariyani (2019)	Ohlson models (Accuracy rate: 83.33%)	Retail companies listed on the IDX in 2015-2017
2	Arini (2021)	Grover Model (Accuracy rate: 76.67%)	Companies included in Kantar's 2019 Top 30 Global Retails (EUR)
3	Huda et al. (2019)	Zmijewski Model (Accuracy rate: 96.3%)	Retail companies listed on the IDX in 2013-2017
4	Mandalurang et al. (2019)	The Springate model is more accurate than the Altman Z Score model	Retail trade company listed on the IDX in 2014-2018
5	Melissa & Banjarnahor (2020)	Springate Model (Accuracy rate: 98%)	Manufacturing companies in the consumer goods industry sector listed on the IDX in 2014-2018
6	Muzanni & Yuliana (2021)	Zmijewski Model (Indonesian retailer) – Accuracy rate: 87% Altman Z Score model (Singaporean retailer) – Accuracy rate: 86%	Retail companies in Indonesia and Singapore
7	Nilasari & Haryanto (2018)	Zmijewski Model (Accuracy rate: 97.9%)	Retail companies on the IDX in 2012- 2016
8	Sari (2018)	Altman Z Score model (Accuracy rate: 92%)	Food and Beverages companies listed on the IDX in 2014-2011
9	Silaen et al. (2020)	Springate model	PT Hero Supermarket
10	Primasari (2017)	Altman Z Score Model (Accuracy rate: 65.52%)	Consumer Goods Industry in Indonesia
11	Colline (2020)	Springate Model (Accuracy rate: 95.45%)	Retail company in Indonesia

Based on table 4, it can be seen that from previous research that examined the condition of financial distress in retail companies in Indonesia, the conclusions were different from one another. The model with the highest accuracy for each study is also different. In studies of the last 5 years, the Springate model is the most widely mentioned model as the most accurate model for predicting retail company financial distress.

The hypotheses in this study are as follows: 1) There are differences in financial distress conditions before and during the COVID-19 pandemic using the Altman Z Score, Springate, Zmijewski, Ohlson, and Taffler models in primary consumer goods sector companies in Indonesia; 2) The Springate model is the most accurate model for predicting the financial distress of primary consumer goods sector companies listed on the Indonesia Stock Exchange.

METHODOLOGY

Researchers used the method of comparative analysis to determine the comparison between the variables studied. The data used was sourced from annual financial reports. The population in this study were companies in the primary consumer goods sector which were listed on the Indonesia Stock Exchange, totaling 57 companies. The sampling technique used purposive sampling method, with the following criteria; 1) Having a full annual report from 2018 to 2021; 2) Having an annual report in rupiah currency, 3) Having complete data according to the needs of this study.

The sample in this study were 42 companies. The research period is from 2018 to 2021, where 2018-2019 is the period before the COVID-19 pandemic and 2020-2021 is the period during the COVID-19 pandemic. If the data is not normally distributed, then the data is analyzed using the Wilcoxon Signed Rank test. If the Wilcoxon Signed Rank test results show sig. <0.05, then there is a significant difference.

As for calculating the level of accuracy of the model used, following Huda et al. (2019), calculations were carried out using the Altman Z-Score, Springate, Zmijewski, Ohlson, and Taffler formulas. Second, the results obtained are transferred to the standard deviation so that a more significant difference can be seen. Furthermore, the conclusion is drawn, if the results are in accordance with the circumstances that occur, then this method is declared accurate.

The stages of testing in this study are as follows; 1) Enter data used as research samples in Microsoft Excel and process them. Preliminary data processing, namely calculating data from existing samples using formulas from each model; 2) Conduct Wilcoxon Signed Rank test for each measurement model before and during the pandemic; 3) Calculating the analysis of the accuracy of each model by comparing the predicted results with the company's reality conditions. The reality condition of the company that the researcher takes here is if the company experiences a delisting from the stock exchange. The level of accuracy is calculated according to the method mentioned by Kusumaningrum (2021), namely:

$$\text{Level of accuracy} = \frac{\text{Number of correct predictions}}{\text{Number of samples}} \text{ x } 100\%$$

Because the researcher used a 4-year research period, namely 2018 to 2021, the number of correct predictions was averaged over these 4 years. The best prediction model for financial distress is the model that has the highest level of accuracy.

The following presents the variables to be studied:

Table 5
Variable Operationalization

Variable	Indicator	Scale
Financial Distress (Altman Z Score Model)	- Profitability - Solvability - Liquidity - Activity $Z = 1.2X_1+1.4X_2+3.3X_3+0.6X_4+1.0X_5$ Where: X_1 = Working Capital/Total Assets X_2 = Retained Earnings/Total Assets X_3 = Earnings Before Interest and Tax (EBIT)/Total Assets X_4 = Market Value of Shares/Total Debt X_5 = Sales/Total Assets	Ratio
Financial Distress (Springate Model)	- Profitability - Solvability - Liquidity - Activity $S = 1.03\ X_1 + 3.07\ X_2 + 0.66\ X_3 + 0.4\ X_4$ Where: X_1 = Working Capital/Total Assets X_2 = Earnings Before Interest and Taxes/TotalAssets X_3 = Earnings Before Taxes/Current Liabilities X_4 = Sales/Total Assets	Ratio
Financial Distress (Zmijewski Model)	- Profitability - Solvability - Liquidity $X = -4.3 – 4.5X_1 + 5.7X_2 + 0.004X_3$ Where: X_1 = ROA (Return on Asset) X_2 = Leverage (Total Liabilities/Total Assets) or Debt Ratio X_3 = Liquidity (Current Assets/Current Liabilities) or Current Ratio	Ratio

Variable	Indicator	Scale
Financial Distress (Ohlson Model)	- Profitability - Solvability - Liquidity - Activity $O = -1.32 - 0.407X_1 + 6.03X_2 - 1.43X_3 + 0.0757X_4 - 2.37X_5 - 1.83X_6 + 0.285X_7 - 1.72X_8 - 0.521X_9$ Where: X_1 = Logs (Total Assets/GNP index) X_2 = Total Liabilities/Total Assets X_3 = Working capital/Total Assets X_4 = Current Liabilities/Current Assets X_5 = 1 if Total Liabilities > Total Assets; 0 otherwise X_6 = Net income/Total assets X_7 = Cash flow from operation/total liabilities X_8 = 1 if Net Income is negative; 0 otherwise X_9 = Changes in Net Income $(NI_t - NI_{t-1})/(NI_t + NI_{t-1})$	Ratio
Financial Distress (Taffler Model)	- Profitability - Solvability - Liquidity $Z_{Taffler} = 3.20 + 12.18X_1 + 2.50X_2 - 10.68X_3 + 0.0289X_4$ Where: X_1 = Profit Before Tax/Current Liabilities X_2 = Current Assets/Total Liabilities X_3 = Current Liabilities/Total Assets X_4 = Net Profit After Tax/Total Assets	Ratio

Data were analyzed using the Wilcoxon Signed Rank test to measure differences between paired data groups but not normally distributed. If the results of the Wilcoxon Signed Rank test show a sig. <0.05, there is a significant difference between financial distress before and during the COVID-19 pandemic.

FINDINGS AND DISCUSSIONS

There is no significant difference between financial distress before and during the COVID- 19 pandemic using both the Altman Z Score, Springate, Zmijewski, Ohlson, and Taffler models in primary consumer goods sector companies in Indonesia.

Table 6:
Wilcoxon Signed Rank Test Results Financial Distress Before and During the COVID-19 Pandemic

	Altman_during - Altman_before	Springate_during - Springate_before	Zmijewski_during - Zmijewski_before	Ohlson_during - Ohlson_before	Taffler_during - Taffler_before
Z	-0.944[b]	-0.519[c]	-0.006[b]	-0.369[c]	-1.582[b]
Asymp. Sig. (2-tailed)	0.345	0.604	0.995	0.712	0.114

Table 6 shows that the significance value for all models is more than 0.05, which means that there is no significant difference between financial distress before and during the COVID- 19 pandemic using both the Altman Z Score, Springate, Zmijewski, Ohlson, and Taffler models in primary consumer goods sector companies in Indonesia. The financial distress conditions of the sample companies before and after the pandemic are as follows:

Table 7
Sample Company Financial Distress Conditions Before and After the Pandemic

Model	Before the pandemic (2018 to 2019)		During the pandemic (2020 to 2021)	
	Average value	Condition	Average value	Condition
Altman Z Score	3.98	Healthy	3.70	Healthy
Springate	4.08	Not bankrupt	3.57	Not bankrupt
Zmijewski	-2.33	Not bankrupt	-1.40	Not bankrupt
Ohlson	1.84	Distressed	1.92	Distressed
Taffler	2.65	No potential bankruptcy	3.10	No potential bankruptcy

The real conditions of the companies used as research samples as of March 7 2023 are all still listed on the Indonesia Stock Exchange. This means that all sample companies are not in a state of potential bankruptcy during/after the pandemic. When compared with table 7, there are 4 financial distress measurement models that have the same results as real conditions, namely the Altman Z Score, Springate, Zmijewski, and Taffler models. The Ohlson model has different results from real conditions.

Springate and Zmijewski are the most accurate models for predicting the financial distress of primary consumer goods sector companies listed on the Indonesia Stock Exchange.

Table 8
Level of Accuracy of the Financial Distress Measurement Model

Measurement Models	Level of Accuracy
Altman Z Score	57.74 %
Springate	88.69 %
Zmijewski	88.69 %
Ohlson	15.48 %
Taffler	64.88 %

Based on Table 8, models that have a high degree of accuracy are the Springate and Zmijewski models. This level of accuracy is calculated by dividing the number of samples according to real conditions by the total research samples from 2018 to 2021.

CONCLUSION

Based on the results of this study it can be concluded that; 1) There was no significant difference between financial distress before and during the COVID-19 pandemic either using the Altman Z Score, Springate, Zmijewski, Ohlson, or Taffler models for primary consumer goods sector companies in Indonesia; 2) Springate and Zmijewski are the most accurate models for predicting the financial distress of primary consumer goods companies listed on the Indonesia Stock Exchange with an accuracy rate of 88.69%.

The condition of the COVID-19 pandemic has not made most of the primary consumer goods sector companies in Indonesia falter because people will still look for primary necessities such as food and clothing needs for their daily needs. People's purchasing power for primary needs remains high despite the pandemic. However, what is starting to change is the method of buying goods, for example, since the pandemic, buying goods has been directed to online purchases and goods are sent to consumers' homes to reduce direct physical interaction. This is what causes no significant difference in financial distress conditions before and during the pandemic.

This study is expected to be an input for investors whether investing in consumer goods companies will be profitable or not under various conditions. Future research is expected to be able to test other financial distress measurement models for companies similar to this study or other types of companies.

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