Determinants of potential bankruptcy of companies during the Covid-19 pandemic

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Abstract

The Covid-19 pandemic has had a real and widespread impact on all industries in Indonesia, potentially increasing corporate bankruptcy (financial distress). This study examines the effect of financial ratios on financial distress in various industrial sub-sectors on the Indonesia Stock Exchange *(Bursa Efek Indonesia-BEI)* during and before the pandemic. The research began with creating a financial distress prediction model using the Logistics Regression Model with monetary and macroeconomic ratio data input during 2016 – 2020. The economic distress prediction model will measure financial distress during the pandemic and pre-pandemic periods. Empirical testing shows that the pandemic affects the ability of financial ratios to predict bankruptcy. Only the debt ratio and sales growth were significant in predicting bankruptcy during the pre-pandemic period, but cash flow could also expect a default during the pandemic. During a pandemic, sales growth is the most important because it is the aspect most affected by restrictions on consumers' social and economic activities.

Keywords: Bankruptcy; companies; covid-19 pandemic; industrial

1.   Introduction

The Indonesian economy has recovered very significantly due to the Covid-19 pandemic which has been endemic since February 2020. One of the economic impacts was that the rupiah exchange rate against the US$ weakened by 12.4% and the Jakarta Composite Index (*Indeks Harga Saham Gabungan-IHSG*) was corrected by 28.44% from March 2 to April 16 2020. Although this volatility is still relatively better when compared to the 2008 financial crisis, at which time the JCI corrected up to 50% and the Rupiah depreciated by 30.9%. If this pandemic is not handled properly, it is feared that panic will spread and worsened, resulting in a snowball effect. It is not even impossible that the impact of the Covid-19 pandemic on the economic sector could be worse than the 2008 crisis.

World Bank projections predict that the Indonesian economy will contract or be depressed by 2.1% in 2021. The reason is because the spread of the Covid-19 virus has widespread both abroad and within the country so that the economic order has been significantly disrupted. This prediction is also corroborated by Bank Indonesia (BI) projections which estimate Indonesia's economic growth at 5 percent or maybe only 2.5 percent. Covid-19 had a negative impact as an example of a decrease in the price of financial market volatility as well as commodities, of course this impact occurred both abroad and domestically (Syukur *et al.*, 2021). Therefore, concrete steps are needed to deal with the Covid-19 pandemic outbreak so that its impact can be suppressed in such a way.

The government and society responded to concern over the high rate of spread of this pandemic with the imposition of Large Scale Social Restrictions (*Pembatasan Sosial Berskala Besar-PSBB*) in most extensive areas in Indonesia, which slowed down the economic cycle. This economic slowdown had a different impact on each industry. The survey results by Bank Indonesia (BI) noted that the most

significant decline in business activity occurred in the manufacturing, trade, hotel, and restaurant sectors, as well as the services sector, due to reduced demand. The Indonesian Ministry of Finance (*Kementerian Keuangan-Kemenkeu*) recorded at least eight losses due to the outbreak of the virus. First, until April 11, 2020, more than 1.5 million employees went on strike or terminated employment relations (*Pemutusan Hubungan Kerja-PHK*) and were formulated. Each of which comes from the formal sector as much as 1.2 million, in the informal sector alone as many as 265,000. Second, Indonesia's Purchasing Managers' Index (PMI) is below 50, only getting an index of 45.3 in March 2020. Third, from 15 airports, 12,703 flights had to be canceled during the January-February period due to the restrictions in place. The details of these flights are 1,023 foreign flights and 11,680 domestic flights. Fourth, the result of the flight cancellation itself caused a loss of around Rp. 207 billion for the aviation services sector alone. Fifth, tourist arrivals have fallen to 6,800 every day, especially tourists coming from China, the country where Covid-19 originated. Sixth, an estimate from PHRI is that the occupancy rate of hotels or inns from 6,000 places will drop by 50%. Of course this will greatly affect the decline in foreign exchange in the tourism sector. Seventh, Indonesia's imports from January to March 2020 fell by 3.7% year to date (YTD). Eighth, March 2020 inflation recorded at 2.96% year on year (yoy) was also contributed by an increase in the price of gold jewelery because some food prices had soared (Syukur *et al.*, 2021). On the other hand, the sectors considered to have benefited during this pandemic are the telecommunications sector due to the policy to stay at home and the pharmaceutical industry due to the increasing public demand for health products such as medicines, vitamins and masks, and others.

The different impacts on each of these industrial sectors will determine how far the perceived financial distress profile of each company (Cladera et al., 2021). The current financial distress prediction model consists of various models such as the Springate Model, the Altman Z-Score, the Zmijewski Model, and the Grover Model. These use internal indicators (financial ratios) based on company financial reports. The internal (micro) factors of the company are considered to be still unable to predict the financial distress felt by each company. Therefore external factors (macroeconomics) as an influential systematic risk are included in predicting this (Habib et al., 2020). Several empirical tests, including by Sumani (2020), Widhiari and Merkusiwati (2015), Artha (2014), Indrayani and Nazar (2020), Priyatnasari and Hartono (2019), found that financial ratios proved capable of predicting the probability of bankruptcy of a company in various types of different industries.

The results of this study were carried out during standard economic times, and there were variations in the impact of each financial ratio on financial distress. This study will measure the effect of each financial ratio on financial distress during regular economic times (Pre-Pandemic Period) and turbulent (Pandemic Period) in various economic sectors, as well as determine which variable is the most dominant. Thus this research can cover the gaps in previous research and, at the same time, become a novelty.

2. Literature review
Signaling theory

Signaling theory is the basis of this research because the financial ratios used come from published financial reports. These financial reports are used to signal company management policies to the public or investors. Signaling theory is a demand to explain financial report information to external parties due to the disparity of information between the company and external parties, this is because internal companies know better about the future prospects of external parties (investors or creditors). To deal with this, one way to reduce information disparities is by explaining reliable financial information as well as mitigating risks the company faces in the future. According to Brigham and Houston (2001) a signal or signal is an action taken by company management that informs investors about how management sees the company's prospects. Companies that choose to seek new capital with debt rather than selling their shares can be said if the company has profitable prospects or opportunities in the future.

Conversely, companies with unfavorable prospects will tend to sell their shares. Signaling theory can show information in financial reports to management and other parties of concern within the company. Signal theory on financial distress explains that financial report information can be used as a medium to discover possible signals of company failure or bankruptcy.

Determinants of financial distress

Financial distress is when a company experiences financial difficulties before bankruptcy occurs. Financial distress can start when a company experiences continuous operational losses resulting in a lack of capital. A decrease in their financial ability characterizes companies experiencing economic pain, so they have the potential to experience bankruptcy or the inability to pay off their debts and obligations (Natariasari and Indarto, 2014). Conversely, companies not experiencing financial distress will be more flexible in carrying out their operations and can guarantee the security of investors' and creditors' funds. Deteriorating economic conditions on an ongoing basis will lead to bankruptcy unless the company takes immediate action to resolve the problem. Dwijayanti (2010) revealed that there are 3 (three) reasons a company can experience financial distress which has the potential for bankruptcy, namely: 1) Neoclassical Model, in which companies do not allocate their resources effectively. 2) Financial Model, where there is a problem with the company's liquidity. 3) Corporate Governance Model, where the company is managed in a way that could be better. Rodoni and Herni (2014), revealed that three conditions trigger financial distress in terms of economic aspects, namely: 1) The capital shortage factor due to an imbalance in the flow of revenue with the expenditure of funds. 2) High debt and interest expense due to poor risk management. 3) Suffer operational losses continuously.

Mustafa (2017), states that financial distress conditions will have an impact on 1) economic failure, namely a condition where the income received by the company is not sufficient to cover the company's operational costs. If this happens continuously, the company will experience operating losses over several years and business failure. 2) Business Failure, namely when the company fails, can cause losses to creditors because the company cannot pay its debts. Because of the severe impact of financial distress, companies need to know what factors can cause economic pain as an early warning so that the company does not go bankrupt. Financial distress can be predicted using financial and macroeconomic ratios (Chang *et al.*, 2019). Financial ratios are indicators of company performance that show the extent to which a company manages resources efficiently and effectively. This financial ratio is also a relatively controllable variable for the company. Information on financial ratios is very useful, especially for investors as a consideration for investing in certain companies, for creditors as an estimate of the potential risks associated with guaranteed payment of interest expenses and principal loans, especially for company management who use financial ratios as a reference in making decisions (Bhattacharjee and Han, 2014).

Previous research has shown the effect of financial ratios on financial distress. Analysis by Arilyn (2020), Sumani (2020), and Burhanuddin *et al.* (2019) found Total Asset Turnover, Debt to Asset Ratio, Sales Growth, and Curret Ratio with good ability to predict financial distress. Total Asset Turnover, Debt to Asset Ratio, Sales Growth, and Curret Ratio prove financial distress if these ratios have a positive impact. Platt and Platt (2002), state that the current ratio and return on assets are the most frequently used financial ratios and have a high predictive ability for financial distress, in addition to total asset turnover (Cherotich, 2018). If a company has an excellent current ratio, return on assets, and total asset turnover, it is less likely to experience financial distress. Yap *et al.* (2012), found that the debt-to-asset ratio can be used in predicting financial distress because it can show how much the company bears the financial burden. The greater the financial burden, the more likely the company will experience financial distress even though Sumani (2020) research did not find a significant effect of the debt-to-asset ratio on financial distress because even though the company has a high debt-to-asset ratio, it is not necessarily accompanied by a high financial burden. The higher it is, so it can still generate adequate profits and avoid financial distress. Another financial ratio influencing financial distress is sales growth because the higher the sales growth, the higher the company's income and ability to pay its financial burdens. Wulandari and Fitria (2019) found that the sales growth ratio significantly negatively affected the company's financial distress.

Hypothesis development

The definition of Current Ratio is the ratio used to measure a company's ability to pay its short-term obligations (Brigham and Houston, 2001). A company with a high Current Ratio indicates that it will be able to pay its short-term debts. In contrast, a low Current Ratio means the company may experience financial distress. The research results of Arilyn (2020) and Burhanuddin *et al.* (2019) found that the current ratio has a significant influence in predicting a company's financial distress. Based on this description, the hypotheses that can take are:

H1: Current ratio can predict financial distress.

The debt-to-asset ratio measures how much a company's assets are funded by debt (Brigham and Houston, 2001). Suppose the ratio of debt owned by a company to its assets is very high. This indicates that the assets acquired by the company come from debt, which has the potential to cause financial distress. Because the debt burden is getting higher, companies are worried about experiencing default due to payment difficulties. The results of research by Yap *et al.* (2012), and Sumani (2020) show that the debt-to-asset ratio has a significant positive effect on financial distress. Based on this description, the research hypothesis is formulated, namely:
H2: Debt to asset ratio can predict financial distress.

Total asset turnover is the ratio used to measure the turnover of all assets owned by a company (Brigham and Houston, 2001). Companies that have a higher total asset turnover value show their ability to manage assets. So that it can reduce financial distress and increase sales steps so that they are higher. According to Yap *et al.* (2012), that total asset turnover hurts financial distress. This is reinforced by Antikasari and Djuminah (2017) research that can use total asset turnover to predict a company's financial distress. Based on this description, the hypotheses that can take are:
H3: Total asset turnover can predict financial distress

The growth ratio (sales growth) shows the company's ability to increase sales from time to time (Widarjo and Setiawan, 2009). Sales growth reflects the success of the company's investment in the past period and can be used as a prediction for the company's growth in the future. Research by Widhiari and Merkusiwati (2015) states that sales growth significantly negatively affects the case of financial distress.
H4: sales growth can predict financial distress

3. Method

This research is explanatory research using the data period for 2015-2020 with a research population of companies in the sub-sectors: Pharmaceuticals (10), Telecommunications (6), Hotels and Restaurants (35), Health (7), and Financing Institutions (19). Meanwhile, the sample was selected based on specific criteria (purposive sampling): having been IPO and never experiencing delisting from 2015 to 2020. To test the difference in the effect of the independent variable on the dependent variable before the Covid-19 pandemic and during the Covid-19 pandemic, the data will be disaggregated into two, namely:
  a. Before the covid-19 pandemic: average data for 2015 – 2019
  b. Before the covid-19 pandemic: data for 2020

The dependent variable in this study is financial distress. A company is said to be experiencing economic pain if, for two consecutive years, it has experienced negative net operating profit, while a company that has not experienced negative operating profit for two straight years is categorized as not experiencing financial distress. Independent variables are financial ratios, including Current Ratio, Debt to Assets, Sales Growth, and Total Asset Turnover.

The analytical model used in this study is logistic regression analysis. This analysis is used if the dependent variable data is in the form of dichotomous data. Dichotomous data is nominal data with two categories, such as healthy or unhealthy. The dichotomous value is usually expressed as 0 or 1 (Sumani, 2020). The stages in the logistic regression analysis are as follows.
  a. Grouping the initial sample based on financial distress conditions
  b. Create a logit analysis model for predicting financial distress based on the following model.

$$FD_i = Ln\left(\frac{P_i}{1 - P_i}\right) = \alpha_0 + \beta_1 CR + \beta_2 DA + \beta_3 SG + \beta_4 TAT \dots (1)$$

Several tests in assessing the fit model of logistic regression analysis:
  a. -2 Logs Likelihood
     If the -2 Log Likelihood value decreases, the hypothesized model fits with the data.
  b. Cox and Snell's R Square and Nagelkerke R Square

Cox and Snell's R Square is a measure to compare the value of -2 Log Likelihood with the full scale. Meanwhile, Nagelkerke R Square is a form of testing to determine how much the independent variable can explain the dependent variable.

c. Hosmer and Lemeshow's Goodness of Fit Test

This statistical test is used to test whether the value used follows empirical data. If the value of Hosmer and Lemeshow's Goodness of Fit Test is equal to or less than 5%, the author can conclude that the hypothesis test cannot be continued later. In contrast, if the value is more than 5%, then the model is suitable for further analysis.

Testing the significance level carried out in this study is a partial (individual) test. Therefore, this test was carried out using the Wald test using a significance level of 5%. Criteria for decision making, namely:

a. If the p-value of the Wald test (Sig) > α, then $H0$ is accepted, which means that the independent variable partially does not affect the company's financial distress.

b. If the p-value of the Wald test (Sig) ≤ α, then $H0$ is rejected, which means that the independent variables partially affect the company's financial distress.

4. Results and discussion
Pre-pandemic predictability

Table 1. Pre-pandemic predictability model

Nagelkerke R square	Hosmer and Lemeshow test probability	Predicted percentage
0.722	0.708	67.3

Before the pandemic, the four variables used as predictive models had an excellent fit value because the probability value was > 0.05 (prob 0.708). The predictive determinant value in the Nagelkerke R Square model is also high, at 72.2%. In addition, the model's accuracy in predicting bankruptcy reaches a percentage of 67.3%.

Table 2. Predictability pre-pandemic

	B	Sig.
CR0	-2.401	0.492
DA0	2.350	0.048
TAT0	-2.310	0.169
SG0	-1.587	0.047
Constant	1.515	0.213

Before the pandemic, sales growth (SG) and debt ratios (DA) were seen, which could predict company bankruptcy. The two ratios have relatively the same level of influence (coefficient). At the same time, cash flow (CR) and asset turnover (TAT) cannot predict bankruptcy.

Predictability at pandemic

Table 3. Predictability model at pandemic

Nagelkerke R square	Hosmer and Lemeshow test probability	Predicted percentage
0.654	0.943	57.7

During the pandemic, the four variables as a prediction model have an excellent fit value because the probability value is > 0.05 (prob 0.943). This figure is higher than before the pandemic. The predictive determinant value seen in the Nagelkerke R Square model has decreased compared to the pre-pandemic period, which was 65.4%. In addition, the model's accuracy in predicting bankruptcy was also reduced by 57.7%.

Table 4. Predictability at pandemic

	B	Sig.
CR1	-0.935	0.045
DA1	0.592	0.046
TAT1	-1.912	0.190
SG1	-1.103	0.029
Constant	1.239	0.200

During the pandemic, it was seen that there was a significant addition of variables in predicting bankruptcy, namely cash flow (CR). So that the number of variables that can predict bankruptcy is three variables, namely cash flow (CR), sales growth (SG), and debt ratio (DA). Meanwhile, asset turnover (TAT) is still unable to predict bankruptcy. Of the three proportions, sales growth is the ratio with the most excellent predictability (-1,103), followed by cash flow (-0,935), and finally, the ratio of debt to assets (0,592). Sales growth is the most important factor because, during the pandemic, sales were affected by restrictions on consumers' social and economic activities. Sales are also a source of company income that affects cash flow and the ability to pay the company's current liabilities.

The results of this test support several previous studies (Artha, 2014; Indriyani and Nazar, 2020; Sumani, 2020; Widhiari and Merkusiwati, 2015). The addition of financial ratios that can predict company bankruptcy shows that the difficult economic situation due to the Covid-19 pandemic impacts the importance of companies maintaining their financial ratios. Cash flow, which was insignificant in pre-pandemic times in predicting bankruptcy, became important during the pandemic. When the pandemic occurred, many companies experienced a decrease in income due to restrictions on the community's social activities as consumers. This decrease in social activity also means economic regulations that reduce people's purchasing power, reducing their consumption level.

5. Conclusion

Empirical testing shows that pandemic exposure can influence the determination of financial ratios to predict potential company bankruptcy. During the pre-pandemic period, there were only two significant variables in predicting bankruptcy, but during the pandemic, there were three variables. During the pandemic, the sales growth ratio was the most dominant predictor of potential bankruptcy, followed by cash flow and, finally, the company's debt ratio. Sales growth is the most critical factor because it is most affected by restrictions on consumers' social and economic activities. For further research, it is suggested to include macro factors as a determinant of potential corporate bankruptcy because there has been a lot of empirical evidence showing the significant influence of macro factors on predicting the potential for corporate bankruptcy. Company managers can pay more attention to sales, cash flow, and debt ratios because investors and creditors may focus on these three aspects before deciding to invest or lend funds.

References

Antikasari, T.W. and Djuminah, D. (2017), "Memprediksi Financial Distress Dengan Binary Logit Regression Perusahaan Telekomunikasi", *Jurnal Keuangan Dan Perbankan*, Vol. 21 No. 2, pp. 265–275, doi: 10.26905/jkdp.v21i2.654.

Arilyn, E.J. (2020), "The Effect of Financial Ratios and Macroeconomic Variables to Financial Distress of Agriculture Industry Listed in the Indonesia Stock Exchange from 2013 to 2018", Vol. 115 No. Insyma, pp. 347–349, doi: 10.2991/aebmr.k.200127.071.

Artha, D.R. (2014), "Analisis Fundamental , Teknikal Dan Makroekonomi", *Jurnal Manajemen Dan Kewirausahaan*, Vol. 16 No. 2, pp. 175–183, doi: 10.9744/jmk.16.2.175.

Bhattacharjee, A. and Han, J. (2014), "Financial distress of Chinese firms: Microeconomic, macroeconomic and institutional influences", *China Economic Review*, Vol. 30, pp. 244–262, doi: 10.1016/j.chieco.2014.07.007.

Brigham, E.F. and Houston, J. (2001), *Dasar-Dasar Manajemen Keuangan*, 8th ed., Salemba Empat, Jakarta.

Burhanuddin, A., Sinarasri, A. and S, R.E.W.A. (2019), "Analisis Pengaruh Likuiditas , Leverage Dan Sales Growth Terhadap Financial Distress (Studi Kasus Pada Perusahaan Property Dan Real Estate Yang Terdaftar Di Bei Tahun 2014-2018)", *Prosiding Mahasiwa Seminar Nasional Unimus*, Vol. 2, pp. 532–543.

Chang, X., Chen, Y. and Dasgupta, S. (2019), "Macroeconomic conditions, financial constraints, and firms'

financing decisions", *Journal of Banking and Finance*, Elsevier B.V., Vol. 101, pp. 242–255, doi: 10.1016/j.jbankfin.2018.10.016.

Cherotich, E. (2018), "Prediction of Financial Distress in the Light of Financial Crisis : a Case of Listed Firms in Kenya", Vol. VI No. 6, pp. 207–226.

Crespí-Cladera, R., Martín-Oliver, A. and Pascual-Fuster, B. (2021), "Financial distress in the hospitality industry during the Covid-19 disaster", *Tourism Management*, Vol. 85, doi: 10.1016/j.tourman.2021.104301.

Dwijayanti, P.F. (2010), "Dampak Dan Prediksi Dari Financul D /, Stness Serta Solusi T] Nttjk Mengatasi Financul D /, Sure , Ss", *Jurnal Akuntansi Kontemporer*, Vol. 2 No. 2, pp. 91–205.

Habib, A., Costa, M.D., Huang, H.J., Bhuiyan, M.B.U. and Sun, L. (2020), "Determinants and consequences of financial distress: review of the empirical literature", *Accounting and Finance*, Vol. 60 No. S1, pp. 1023–1075, doi: 10.1111/acfi.12400.

Indriyani, U. and Nazar, S.N. (2020), "Pengaruh Makro Ekonomi Dan Rasio Perbankan Terhadap Prediksi Financial Distress", *Jurnal Ilmiah Akuntansi Universitas Pamulang*, Vol. 8 No. 1, p. 53, doi: 10.32493/jiaup.v8i1.3769.

Mustafa. (2017), *Manajemen Keuangan*, ANDI, Yogyakarta.

Natariasari, R. and Indarto, M. (2014), "Manfaat laba dan arus kas untuk memprediksi kondisi financial distress (studi pada perusahaan manufaktur di bursa efek Indonesia)", *Jurnal Sosial Ekonomi Pembangunan*, Vol. 6 No. 11, pp. 152–173.

Platt, H.D. and Platt, M.B. (2002), "Predicting Corporate Financial Distress: Reflections on Choice-Based Sample Bias", *Journal of Economics and Finance*, Vol. 26 No. 2, pp. 184–199.

Priyatnasari, S. and Hartono, U. (2019), "Rasio Keuangan, Makroekonomi dan Financial Distress: Studi Pada Perusahaan Perdagangan, Jasa dan Investasi di Indonesia", *Jurnal Ilmu Manajemen*, Vol. 7 No. 4, pp. 1005–1016.

Rodoni, A. and Herni. (2014), *Manajemen Keuangan Modern*, Mitra Wacana Media, Jakarta.

Sumani, S. (2020), "Prediksi Financial Distress : Rasio Keuangan Dan Sensitivitas Makroekonomi Perusahaan Sektor Primer", *EKUITAS (Jurnal Ekonomi Dan Keuangan)*, Vol. 3 No. 3, pp. 285–305, doi: 10.24034/j25485024.y2019.v3.i2.4153.

Syukur, M., Salam, M.N. and Junaidi, M.I. (2021), "Dampak Pandemi Covid-19 terhadap Perekonomian Indonesia: Analisis terhadap Sektor Domestik dan Stabilitas Inflasi", *TRILOGI: Jurnal Ilmu Teknologi, Kesehatan, Dan Humaniora*, Vol. 2 No. 3, pp. 382–388, doi: 10.33650/trilogi.v2i3.3082.

Widarjo, W. and Setiawan, D. (2009), "Pengaruh Rasio Keuangan Terhadap Kondisi Financial Distress Perusahaan Otomotif", *Jurnal Bisnis Dan Akuntansi*, Vol. 11 No. 2, pp. 107–119.

Widhiari, N.L.M.A. and Merkusiwati, N.K.L.A. (2015), "Pengaruh Rasio Likuiditas, Leverage, Operating Capacity dan Sales Growth Terhadap Financial Distress", *E-Jurnal Akuntansi*, Vol. 11 No. 2, pp. 456–469.

Wulandari, V.S. and Fitria, A. (2019), "Pengaruh Kinerja Keuangan, Pertumbuhan Penjualan Dan Ukuran Perusahaan Terhadap Financial Distress", *Jurnal Ilmu Dan Riset Akuntansi*, Vol. 8 No. 1, pp. 1–18.

Yap, B.C.F., Munuswamy, S. and Mohamed, Z. (2012), "Evaluating Company Failure in Malaysia Using Financial Ratios and Logistic Regression", *Asian Journal of Finance & Accounting*, Vol. 4 No. 1, pp. 330–344, doi: 10.5296/ajfa.v4i1.1752.