
**ANALYSIS OF COMPANY BANKRUPTCY POTENTIAL DURING THE
COVID-19 PANDEMIC: A STUDY OF THE TRANSPORTATION AND
HEALTH SECTOR IN INDONESIA IN 2020-2021**

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ARTICLE INFO	ABSTRACT
Accepted : 02-08-2023	The Covid-19 pandemic that occurred has damaged the economy of Indonesia and even the world. This poses a threat to companies in various sectors. Thus, this study aims to examine the role of financial ratios (current ratio, debt to asset ratio, return on assets, total asset turnover, sales growth) and macroeconomic factors (lending rate) in predicting potential bankruptcy conditions in transportation and health companies in Indonesia during the Covid-19 pandemic. The study was conducted with the Altman Z-Score of developing countries measured by the panel data regression method. The data used in this study were secondary data obtained from the Thomson-Reuter data stream. The population of this study is companies listed on the Indonesia Stock Exchange (IDX) for the 2020-2021 period with a sample of 69 companies. Based on the results of the research, it was found that the factors of the current ratio, debt-to-asset ratio, and sales growth have a significant effect on the potential bankruptcy of the company. This research is limited by relevant data and time during the Covid-19 pandemic.
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Introduction

Knowing the condition of a company's financial health is important, moreover after the covid-19 outbreak that has hit Indonesia since February 2020 (Harjoto, Rossi, Lee, & Sergi, 2021). The government and society have responded to this pandemic by implementing policies namely Pembatasan Sosial Berskala Besar (PSBB) in several regions which caused slowed down the economic cycle. These have created various positive and negative impacts on several industrial sectors (Nasruddin & Haq, 2020). The result of the Bank Indonesia survey showed that there was a significant decline in business activity in some industries such as transportation & logistic, service, restaurant, hotel, trade, and processing industries due to low demand. In the reverse, telecommunications and pharmaceutical industries gained benefit from the situation because society tends to choose to invest in medicines and communications equipment (Mazur, Dang, & Vega, 2021). Unlike state-owned companies, private companies do not have many financial rescue options in facing potential bankruptcy. Therefore, every company should arrange strategies anticipating financial distress.

Altman Z-Score is one of the tools to predict the health of the company by using the company's financial data. In this paper, we will find out the relationship between

financial factors and macroeconomic of Indonesia factors with the potential bankruptcy of companies in the transportation and healthcare sectors during the COVID-19 pandemic in Indonesia to help stakeholders of the company arrange strategy of their companies. This research will be conducted using the Altman Z-Score and processed using data panel regression methods. The justification for this topic stems from the significant effects of the pandemic on the Indonesian economy, particularly in these sectors.

The novelty of this topic lies in its focus on the transportation and healthcare sectors during a crisis, which presents a unique context for analysis. By examining the impact of financial ratios, such as liquidity ratio, debt-to-asset ratio, return on asset, total asset turnover, sales growth, and operating cash flow, as well as the macroeconomic factor of lending rate, this study aims to contribute to the knowledge by providing insights into the dynamics of these industries during the COVID-19 pandemic and the factors that determine the likelihood of bankruptcy.

The objective of the article is to measure the influence of financial ratios and macroeconomic factors on the potential bankruptcy of companies in the transportation and healthcare sectors during the COVID-19 pandemic in Indonesia. Specifically, the study aims to determine which factors have the most dominant influence on bankruptcy potential and to identify any significant differences between the two sectors.

The article will utilize a quantitative research method, collecting data from financial reports of companies listed on the Indonesia Stock Exchange (BEI) and macroeconomic data sources. Statistical techniques, such as regression analysis, will be employed to analyze the relationship between the variables and bankruptcy potential. The article will consist of several sections. The introduction will provide an overview of the topic, the justification for the research, and the research gap. The literature review will summarize existing research on the impact of financial ratios and macroeconomic factors on bankruptcy potential, emphasizing the need for research during crisis periods. The methodology section will describe the research method, data collection process, variables used, and statistical techniques employed for analysis. The results and discussion section will present the findings, analyze the impact of financial ratios and macroeconomic factors on bankruptcy potential in the transportation and healthcare sectors, and discuss any significant differences between the sectors. Finally, the conclusion will summarize the key findings, discuss the implications of the research, and suggest avenues for future research in this area.

Method

This research endeavor aims to enhance the current scholarly understanding by formulating hypotheses derived from prior investigations. By conducting an extensive literature review, the researchers identified noteworthy gaps and unanswered queries within the subject area. Consequently, this study endeavors to bridge these gaps by proposing a series of hypotheses. Specifically, the research focuses on investigating the interplay between seven independent variables and their potential impact on a single

dependent variable. The following academic explanation outlines the process of hypothesis development in detail.

The potential for bankruptcy/financial distress is the first phase before bankruptcy occurs. The potential bankruptcy of a company can be measured using the Altman Z-Score. The Altman Z-Score equation consists of various financial ratios. Financial distress is a condition in which a company has difficulty making a profit or makes very little profit and is likely to go bankrupt, resulting in a loss of company property capital which directly impacts change and forces the company to rebuild to survive. Financial Distress is also indicated by the inability to fulfill its obligations, namely mainly in the form of short-term obligations, in this case in the form of liquidity obligations and solvency. This condition can be measured by several methods, one of which is Altman Z-Score. This method is the most appropriate method for analyzing non-manufacturing, manufacturing companies, and companies in emerging countries. Where is up to 72% accurate in predicting bankruptcy within 2 years and up to 80-90% accurate in predicting bankruptcy within 1 year? Altman's (1968) model, developed using multiple discriminant analysis (MDA), is widely employed as a measure of financial distress. The model identifies accounting ratios that exhibit strong predictive power in determining corporate bankruptcy. The five variables considered the most effective predictors are working capital divided by total assets, retained earnings divided by total assets, earnings before interest and tax divided by total assets, market value of equity divided by book value of debt, and sales divided by total assets. The coefficients associated with these variables, as derived from MDA in Altman (1968), are multiplied by the size of each company, and the aggregated results yield a Z-score. Altman (1968) concluded that companies with a Z-score below 1.81 are at risk of bankruptcy, while those with a Z-score above 2.99 are not likely to go bankrupt. Companies falling within the range of 1.81 to 2.99 have a precarious financial position, commonly referred to as the 'gray area'. However, for non-manufacturing companies and companies in developing countries, a Z-score equation to use in predicting potential bankruptcy:

$$Z = 3.25 + 6.56 X1 + 3.26 X2 + 6.72 X3 + 1.05 X4 \quad (1)$$

Z = Bankruptcy Index

X1 = Working capital / Total asset

X2 = Retained earnings / Total asset

X3 = Earnings before interest and Taxes / Total asset

X4 = Market value of equity / Total liabilities

In classifying of financially good company to distress can be seen from its Z-score in this Altman equation by this category:

1. Below 1.1 indicates bankruptcy risk,
2. Above 2.6 indicates financial stability,
3. Between 1.1 and 2.6 are also categorized in the 'gray area'.

The current measures the company's ability to meet all short-term obligations. Companies that have a high Current Ratio indicate that the company will pay its short-term obligations; conversely, if the Current Ratio is low, it means the company can experience financial distress problems. The research conducted by (Arilyn, 2020) and (Juliani, Rinofah, & Sari, 2022), indicates that the current ratio can significantly influence the prediction of companies at risk of bankruptcy. However, in contrast, the study conducted by (Sumani, 2019) and (Priyatnasari & Hartono, 2019) suggests that the financial factor of the current ratio cannot be used to predict potential bankruptcy. Based on the above explanation, the hypothesis that can be derived is:

Ha1: Liquidity ratio affects potential bankruptcy.

The debt-to-asset ratio measures how much a company's assets are funded by debt (Antikasari & Djuminah, 2017). Suppose the company has a high Debt to asset ratio. In that case, it indicates that most of its assets are obtained through funding from debt and potentially give birth to financial distress due to the higher debt burden (Yap, Munuswamy, & Mohamed, 2012). The company can default due to payment difficulties. The findings of the studies conducted by (Antikasari & Djuminah, 2017), and (Sumani, 2019) reveal that the debt-to-asset ratio has a significant positive impact on the potential bankruptcy condition. These results contradict the research examined. These studies state that the Debt to Asset Ratio (DAR) does not influence predicting potential bankruptcy. Based on the above explanation, the hypothesis that can be derived is:

Ha2: Debt to asset ratio affects potential bankruptcy.

Return on assets or ROA is a ratio that measures how efficiently a company manages its assets to generate profits over a period. ROA represents profitability ratios in financial distress predictions (Fatmawati, 2010). Based on the research findings of (Yuspita, Pebruary, & Zahra Husnil Kamala, 2019) and (Muflihah, 2017), return on assets had a significant negative impact on financial distress in the mining sector listed on the Indonesia Stock Exchange (BEI) from 2012 to 2016. A study conducted by (Habib, Costa, Huang, Bhuiyan, & Sun, 2020) also found a significant negative influence of return on assets on financial distress in the banking companies listed on BEI. In contrast, the research conducted by (Antikasari & Djuminah, 2017) suggests that return on assets has a significant positive impact in predicting financial distress. Meanwhile, studies conducted by (Handayani, 2021) indicate that return on assets does not expect profitability for financially troubled companies. Based on the above explanation, the hypothesis that can be derived is:

Ha3: Return on Asset ratio affects potential bankruptcy

Total asset turnover is the ratio used in measuring the turnover of all assets owned by the company (Brigham and Houston, 2001). According to Harahap (2013: 309) (NURSIDIN, 2021). Total Asset Turnover is a ratio that shows the total turnover of assets measured from sales volume or can be interpreted as how far the ability of all assets to create sales is. Companies with higher total asset turnover demonstrate their ability to manage assets, leading to increased sales efforts and reduced financial distress

risk (Hidayat, Sari, Hakim, & Abbas, 2021). According to (Yap et al., 2012), total asset turnover hurts financial distress, and this is further supported by the research conducted (Antikasari & Djuminah, 2017), which indicates that total asset turnover can be used to predict the financial distress condition of a company. In contrast, the research findings of (Sumani, 2019) and (Priyatnasari & Hartono, 2019) state that total asset turnover cannot be used to predict the financial distress condition of a company. Based on the above explanation, the hypothesis that can be derived is:

Ha4: Total asset turnover affects potential bankruptcy.

The growth ratio (sales growth) shows the company's ability to increase sales over time (Widarjo & Setiawan, 2009). Sales growth reflects the success of the company's investment in the past period and can be used to predict the company's future development (Widarjo & Setiawan, 2009). According to (Handayani, Widiastara, & Amah, 2019), the higher the sales growth, the lower the likelihood of a company experiencing financial distress. The research conducted, states that sales growth has a significant negative impact on the possibility of financial distress. However, this is in contrast to the findings of previous studies (Sumani, 2019), (Muflihah, 2017), and (Ramadhanti, 2022), which indicate that sales growth (SG) does not have an impact on financial distress. Based on the above explanation, the hypothesis that can be derived is:

Ha5: Sales growth affects potential bankruptcy.

OCFS can show the company's ability to generate operating cash flow, one of which comes from equity investment. If the company's operating cash flow is negative, it may not be able to invest in viable projects and prevent the company from receiving external financing (Fernández-Gamez et al., 2020). Companies that have better investment opportunities, will have the desire to generate significant cash flows as a result of high difficulty costs. Based on the above explanation, the hypothesis that can be derived is:

Ha6: Operating cash flow affects potential bankruptcy.

The trade-off theory explains that with corporate debt, companies can reduce taxes and allow companies to increase profits so that companies do not experience financial difficulties. Using debt as a means of reducing taxes can increase the company's interest expense, an increase in interest rates increases interest costs, which can cause the company to become even more in debt due to rising interest rates and cause financial difficulties for the company. According to (Rinofah, Kusumawardhani, & Putri, 2022), companies that borrow money from banks are subject to interest, which means that the higher the interest rate, the lower the company's profits. Based on the above explanation, the hypothesis that can be derived is:

Ha7: Lending rate affects potential bankruptcy.

This study uses an estimation that combines pooled data from both time series and cross-sections using the Ordinary Least Squares (OLS) approach to estimate its parameters. After that, the next step considers the 2 years of data from 2020-2021 for health and transportation firms listed on the Indonesia Stock Exchange. The sample

period of this study from 2020 to 2021 is selected to provide analysis based on the Covid-19 period dataset. Data are collected from the website Revinitif. By the definition of Altman Z-score, a distressed firm is a firm that has a z-score below 1,1. Based on a prior study (Rinofah et al., 2022), the steps of sample selection are as follows (1) health and transportation companies sector, (2) it has conducted an IPO and has not experienced delisting from 2020 to 2021, (3) have complete data related to the variables needed in this study during the research period 2020 to 2021, (4) each company has financial statement Q1, Q2, Q3, Q4 of 2019 to 2020 (5) align with the criteria, there are 23 companies with the incomplete financial statement for Q1-Q4 for 2020 - 2021 from 92 population with total sample 69 companies. Therefore, the sample to be observed is 138 for 2 years.

Following Bhattacharjee & Han, (2014), potential bankruptcy as the dependent variable, we collected companies' Z-score data from secondary data. We collect it from Revinitif and set the filter to companies listed on Indonesia Stock Exchange. Independent variables used in the study include financial and macroeconomic ratios. The financial ratio consists of the current ratio as part of the liquidity ratio, debt to asset as part of the leverage ratio, return on asset as part of the profitability ratio, total asset turnover as part of the activity ratio, and sales growth. Macroeconomics consists of lending rates.

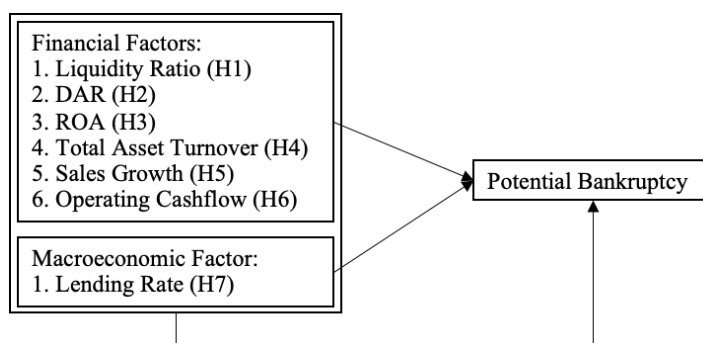


Figure 1. Research model

Based on the general form of panel data regression equations, this research uses the model below:

$$\ln Y_t = \alpha_0 + \beta_1 LQDT_t + \beta_2 DTAR_t + \beta_3 ROAS_t + \beta_4 TATR_t + \beta_5 SGWT_t + \beta_6 OPCF_t + \beta_7 LNDR_t + e_{1t} \quad (1)$$

Where Y is natural logarithm from dependent variable (potential bankruptcy), LQDT is liquidity ratio, DTAR is debt to asset ratio, ROAS is return on asset, TATR is total asset turnover, SGWT is sales growth, OPCF is operating cash flow, and LNDR is lending rate. α_0 is constant, β_1 , β_2 , β_3 , β_4 , β_5 , β_6 , and β_7 is parametric coefficients, and e is error.

Results and Discussion

The findings from the descriptive analysis of the variables in this study are presented in Table 1. Regarding the dependent variable, Potential Bankruptcy, which was assessed using the Altman Z-Score, it was found that the mean score was 6.05, with a standard deviation of 20.2. Turning to the independent variables, the liquidity ratio exhibited a mean of 2.31 and a standard deviation of 2.64. The Debt to Asset Ratio, on the other hand, had a mean value of 0.269, with a standard deviation of 0.311. The Return on Asset Ratio displayed a mean of 0.028, accompanied by a standard deviation of 0.207. In terms of the Total Asset Turnover Ratio, it was observed to have a mean of 0.63, with a standard deviation of 0.55. Moving on to the variable Sales Growth, it showed a mean value of 1.79, with a standard deviation of 0.22. Exploring further, the Operating Cash Flow was found to have a mean of 70.5 billion, and a standard deviation of 258. Finally, the variable Lending Rate exhibited a mean of 0.09, with a standard deviation of 0.00313.

Table 1
Descriptive Statistic

Variable	Mean	SD
Dependent Variable		
Potential Bankruptcy (Z-Score)	6.05	20.2
Independent Variables		
Liquidity Ratio	2.31	2.64
Debt to Asset Ratio	0.269	0.311
Return on Asset Ratio	0.028	0.207
Total Asset Turnover Ratio	0.63	0.55
Sales Growth	1.79	0.22
Operating Cash Flow (in Billion)	70.5	258
Lending Rate	0.09	0.00313

In this research, panel data regression was employed to investigate the influence of several independent variables, namely liquidity ratio, debt-to-asset ratio, return on asset ratio, total asset turnover ratio, sales growth, operating cash flow, and lending rate, on the dependent variable of potential bankruptcy. The regression analysis outcomes are detailed in Table 3, showcasing the relationships between the variables. As depicted in

Table 2, where the random effect model was employed, the regression analysis yielded an adjusted R-squared value of 0.242. This adjusted R-squared value indicates that approximately 24.2% of the variance in potential bankruptcy can be attributed to the independent variables under examination. Hence, these independent variables hold a significant influence on a company's likelihood of facing potential bankruptcy. However, it is important to note that the remaining 75.8% of the variance in potential bankruptcy is influenced by other factors not included in this analysis. These unaccounted variables may include broader economic conditions, industry-specific factors, managerial decisions, or external shocks. Therefore, while the examined independent variables provide valuable insights into potential bankruptcy, it is crucial to consider other factors that may contribute to a comprehensive understanding of this phenomenon.

In Table 3 when looking at the result of hypothesis testing, there are three variables significantly affecting the potential bankruptcy of companies in the health and transportation sector. First, the Liquidity ratio is statistically significant in affecting the potential bankruptcy of a firm measured by z-score. Second, the variable debt-to-asset ratio is statistically significant in affecting potential bankruptcy. Third, variable Sales growth is statistically significant in affecting the potential bankruptcy. The rest variables in this research are statistically not affecting potential bankruptcy companies in the health and transportation sector. The summary of the final hypothesis can be seen in Table 4.

Table 2
Determination coefficient test result

Model	R	R2	Adjusted R2
1	0.530	0.281	0.242

Table 3
Hypothesis Testing

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	3.955	26.119	0.151	0.8799
Liquidity Ratio	2.412	0.671	3.591	0.0005
Debt To Asset Ratio	-12.586	5.882	-2.139	0.0343
Return On Asset Ratio	-3.706	7.150	-0.518	0.6051
Total Asset Turnover Ratio	1.941	3.211	0.604	0.5466
Sales Growth	0.189	0.051	3.688	0.0003
Operating Cash Flow (In Billion)	0.006	0.004	1.512	0.1327
Lending Rate	13.708	271.859	0.050	0.9599

Table 4
Summary of final hypothesis

Initial Hypothesis	Final Hypothesis	Decision
The liquidity Ratio affects potential bankruptcy	The liquidity Ratio affects potential bankruptcy	Reject H01
Debt to Asset Ratio affects potential bankruptcy	Debt to Asset Ratio affects potential bankruptcy	Reject H02
Return on Asset Ratio affects potential bankruptcy	Return on Asset Ratio doesn't affect potential bankruptcy	Do not reject H03
The total Asset Turnover Ratio affects potential bankruptcy	Total Asset Turnover Ratio doesn't affect potential bankruptcy	Do not reject H04
Sales Growth affects potential bankruptcy	Sales Growth affects potential bankruptcy	Reject H05
Operating Cash Flow affects potential bankruptcy	Operating Cash Flow doesn't affect potential bankruptcy	Do not reject H06
Lending Rate affects potential bankruptcy	Lending Rate doesn't affect potential bankruptcy	Do not reject H07

Based on the general form of regression equations as equation 1, the regression equation used in this study is shown in equation 2 below.

$$\ln Y_t = 3.955 + 2.412X_1 - 12.588X_2 - 3.706X_3 + 1.941X_4 + 0.189X_5 + 0.006X_6 + 13.708X_7 + \epsilon_t \quad (2)$$

The research findings indicate that the liquidity ratio has a significant impact on the potential for bankruptcy. The t-test result in Table 3 shows that the current ratio, representing the liquidity ratio, has a t-statistic value of $3.591 > t\text{-table}$, and a probability value of 0.0005. This indicates that H1 is accepted, suggesting that the current ratio significantly predicts the potential for bankruptcy. The positive coefficient value indicates that a higher current ratio corresponds to a higher Altman score in predicting bankruptcy potential, and vice versa. This implies that companies in the healthcare and transportation sectors with high liquidity values were able to avoid bankruptcy during the COVID-19 pandemic, as high liquidity reflects a healthy company condition. This aligns with the research conducted by (Juliani et al., 2022), which suggests that a higher debt-to-asset ratio generally leads to financial distress due to inefficiencies in managing current assets. These findings are also consistent with the studies conducted.

Furthermore, the research reveals that the debt-to-asset ratio (DAR) has a significant impact on the potential for bankruptcy. The t-test results in Table 3 show that the debt-to-asset ratio has a t-statistic value of $-2.3190 < t\text{-table}$, and a probability value of 0.0343. This indicates that H2 is accepted, suggesting that the debt-to-asset ratio partially significantly predicts the potential for bankruptcy. The negative coefficient value indicates that a higher debt-to-asset ratio increases the potential for bankruptcy.

This aligns with the research conducted, which suggests that a higher DAR indicates higher debt, leading to a higher risk of default and potential bankruptcy. These findings are consistent with the studies conducted.

However, the research findings indicate that return on assets (ROA) does not significantly predict the potential for bankruptcy. The t-test result in Table 3 shows that the return on assets has a t-statistic value of $-0.518399 < t\text{-table}$, and a significant value of $0.6051 > 0.05$. This indicates that H3 is rejected, suggesting that a portion of the return on assets does not have a significant impact on predicting the potential for bankruptcy. The research findings also indicate that total asset turnover does not significantly predict the potential for bankruptcy. The t-test result in Table 3 shows that the total asset turnover has a t-statistic value of $0.604392 < t\text{-table}$, and a significant value of $0.5466 > 0.05$. This indicates that H4 is rejected, suggesting that a portion of the total asset turnover does not have a significant impact on predicting the potential for bankruptcy.

On the other hand, the research findings indicate that sales growth significantly predicts the potential for bankruptcy. The t-test result in Table 3 shows that sales growth has a t-statistic value of $3.688577 > t\text{-table}$ and a significant value of $0.0003 < 0.05$. This indicates that H5 is accepted, suggesting that sales growth significantly predicts the potential for bankruptcy. The positive coefficient value indicates that higher sales growth reduces the potential for bankruptcy. Companies with the ability to increase sales are more likely to avoid bankruptcy. This aligns with the research conducted by (Handayani et al., 2019), which suggests that increasing sales reduces the likelihood of bankruptcy, considering that production costs do not exceed company revenues.

The research findings do not indicate a significant impact of operating cash flow on the potential for bankruptcy. The t-test result in Table 3 shows that operating cash flow has a t-statistic value of $1.512918 < t\text{-table}$, and a significant value of $0.130 > 0.05$. This indicates that H6 is rejected, suggesting that operating cash flow partially does not significantly predict the potential for bankruptcy. Similarly, the research findings do not indicate a significant impact of lending rates on the potential for bankruptcy. The t-test results in Table 4.9 show that the lending rate has a t-statistic value of $0.050427 < t\text{-table}$, and a significant value of $0.9599 > 0.05$. This indicates that H7 is rejected, suggesting that a portion of the lending rate does not significantly predict the potential for bankruptcy.

Overall, this research highlights the significant influence of liquidity ratio, debt-to-asset ratio, and sales growth on the potential for bankruptcy, while return on assets, total asset turnover, operating cash flow, and lending rate do not have significant predictive power.

Conclusion

The study concluded that liquidity, as measured by the current ratio, significantly predicted bankruptcy risk, with higher ratios associated with lower bankruptcy potential.

In addition, the debt-to-asset ratio (DAR) also has a significant effect, with a higher ratio increasing the risk of bankruptcy. Sales growth is also an important predictor, with higher growth reducing the likelihood of bankruptcy by increasing revenue to cover operating expenses. However, return on assets (ROA) and total asset turnover do not have a significant impact on bankruptcy predictions. Companies should focus on maintaining good liquidity, controlling debt ratios, and increasing sales growth to reduce bankruptcy risk. In addition, some important managerial implications include maintaining high liquidity during a crisis, effective management of current assets and liabilities, emphasis on sales growth, controlling debt ratios, monitoring operational cash flow, and optimizing cash flow management. The study has limitations due to its focus on the Covid-19 pandemic crisis period, and suggestions for future research include considering external factors such as interest rates, inflation, and government regulation in influencing a company's bankruptcy potential as well as exploring the interaction between financial ratios and non-financial factors in bankruptcy prediction.

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