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Research Article

Springate Model to Analyze Liquidity, Leverage, and Profitability Ratios Toward Financial Distress

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Abstract: This study systematically analyses the predictive ability financial ratios have in relation to the emergence of financial distress among non-cyclical companies on the Indonesia Stock Exchange during the period 2020-2023. Secondary data was collected from a sample of 151 secondary data companies listed on the Indonesia Stock Exchange, spanning the years from 2020 to 2023. In order to ascertain the relationship between the independent variables (X1, X2, X3) and the dependent variable, Multiple Linear Regression models are utilised by employing the Eviews calculation application. As a model, the Springate model is employed, which is used to measure financial distress. The financial ratios selected for analysis encompass the liquidity ratio, the leverage ratio, and the profitability ratio. The findings of this study suggest that the profitability ratio exerts a substantial positive effect, or a moderate effect, on the phenomenon of financial distress. In contrast, the liquidity ratio and leverage ratio demonstrate an absence of statistically significant influence on the phenomenon of financial distress. Extensive analysis of the results indicates that financial distress, as measured by Springate, does not exert a substantial influence on the findings obtained from this study. The incorporation of diverse samples and models in subsequent studies is likely to introduce variations into the research outcomes.

Keywords: financial distress; leverage; liquidity; profitability; springate

1. Introduction

The economic crisis has impacted Indonesia, a developing country, on several occasions. For instance, in 1998, the nation experienced a monetary crisis, in 2008 due to the subprime mortgage crisis, in 2013 due to the decline in US interest rates and crude oil prices, and most recently in 2021 due to the impact of the Covid-19 pandemic (Amri & Aryani, 2021). The economic field has been particularly impacted, as it is associated with numerous companies that are affected by the consequences of these crises. This necessitates a re-evaluation of the significance of financial distress prediction as a reference point and a preventative measure for academics and the company itself.

Financial distress is defined as the inability of a company to generate sufficient income or revenue to fulfill its financial obligations (Mukherjee et al. 2020). Financial distress is a symptom that companies should be aware of. The financial distress is increasingly studied when it occurs in several major events such as the Covid-19 pandemic, the declining value of the US dollar, the massive growth in the Industrial Revolution 2.0 era, and the current state of the world economy that is linked to the policies of the superpower countries towards other countries due to the Cold War, trade wars, and political and state instability in several countries. It is widely acknowledged that the ability to forecast financial distress is one of the most reliable indicators of whether a company is likely to experience long-term growth and

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to what extent it will be successful in a competitive market (Kliestik, Valaskova, Lazaroiu, Kovacova, & Vrbka, 2020).

Financial distress correlates in line with the health of the company, which is significant because it affects all aspects that occur in a company such as the number of shares provided by the company, an increase or decrease in dividends to investors, to the amount of revenue generated, these matters because a healthy company is a company that minimizes the symptoms of financial distress experienced as little as possible.

Non-cyclical companies are a durable field, characterised by the ready-to-use status of their products, which are not subject to fluctuations in the economy. However, it should be noted that this expression does not always align with the actual data observed in the field. Specifically, net profit fluctuations were exhibited by non-cyclical companies listed on the IDX throughout the 2020-2023 period (idx.co.id, 2023).

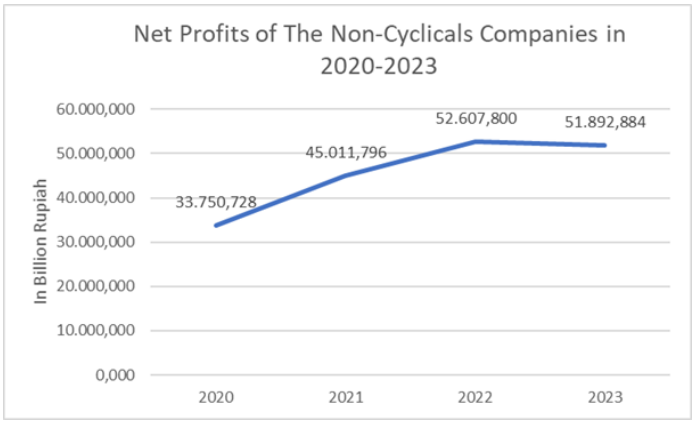

Figure 1 source: author via IDX with data processed

A notable surge in net profit was observed from 2020 to 2021, a period that coincided with the global pandemic of the Coronavirus. This finding indicates that non-cyclical companies are a durable field. A similar trend was observed in 2022, with an increase of 16.87%. However, in 2023, the opposite occurred, with a net profit of Rp. 51,892,884 being reported. Continued existence of this condition could indicate the company's inability to maintain adequate financial performance, which could result in financial distress. The utilization of financial ratios is imperative for the early identification of risks, thereby facilitating enhanced risk prediction.

Financial ratios are employed in the evaluation of a company's financial performance by comparing financial statements, including balance sheets, income statements, statements of changes in equity, and cash flow statements. The utilization of financial ratios assists investors and managers in minimizing potential weaknesses experienced by the company, evaluating the company's financial condition, and facilitating the development of effective investment and operational decisions (Suot & Koleangan, 2020).

Liquidity ratios are comprised of the current ratio, the quick ratio and the cash ratio. The leverage ratio encompasses the debt-to-equity ratio, the debt-to-assets ratio, and the debt-to-capital ratio. The profitability ratios encompass Net Profit Margin (NPM), Gross Profit

Margin (GPM), Return On Assets (ROA), and Return On Equity (ROE). In this study, the calculation of financial distress will use liquidity ratio, leverage ratio, and profitability ratio with the non-cyclical companies are listed from 2020-2023 on the BEI/IDX as the object of study.

The measurement of financial distress typically requires several influencing financial ratio variables, including the profitability ratio, liquidity ratio, leverage ratio and activity ratio (Podedworna-Tarnowska, 2023). The models employed to forecast the financial distress of companies are subject to variation, depending on the methodology selected. There are four widely utilised models that are frequently employed in the calculation of financial distress predictions: the Altman Z-score model (1968) (Ebaid, 2022), the Springate model (1978) (Pramesti & Yuniningsih, 2023), the Zmijewski model (1983) (Muzanni & Yuliana, 2021), and the Grover model (2001) (Liew et al. 2023). Researchers who work on calculating the prediction of financial distress very often use one of these four models (Mukherjee et al. 2020).

The Springate model constitutes an adaptation of the 1968 Altman Z-Score model, with enhanced variations. The merits of this model are evident in its strategic placement of status, which can be distilled into two conclusions: distress and non-distress. A primary rationale for selecting the Springate model as a metric for predicting financial distress is its ability to yield unambiguous results (Pramesti & Yuniningsih, 2023). This particular model finds application in non-financial companies operating within the real sector, such as non-cyclical companies. The ratios employed in this model reflect the operations of non-financial companies rather than financial companies due to the divergent structure of financial statements.

Ratios of liquidity, leverage and profitability are employed in the calculation of financial distress, yet this is contingent upon the capacity of the company to fulfil short-term obligations, extant reliance on debt financing of assets, and the company's ability to generate profits from operational activities (Aslamiah et al. 2023).

These three ratios are the most commonly used variables in the prediction of financial distress. Numerous studies exist which demonstrate conflicting results with regard to previously conducted studies. Research conducted by (Dirman, 2020) demonstrates that only the profitability ratio exerts a significant effect on financial distress, while the liquidity ratio and leverage ratio demonstrate no significant effect. (Saudicha & Kautsar, 2024) have found that the leverage ratio exerts a significant influence on financial distress. The remaining two ratios, the profitability ratio and the liquidity ratio, have been found to have no significant effect on financial distress. Moreover, the research findings of (Chandio & Anwar, 2020) posit that the liquidity ratio is the only ratio that has a significant impact on financial distress. A close examination reveals that the profitability ratio and the leverage ratio do not support the significant response shown to financial distress. Until the research findings of (Moch et al. 2019) were published, it was not known that the three ratios (i.e. liquidity ratio, leverage ratio

and profitability ratio) significantly affect the phenomenon of financial distress. The diversity of the results of these studies on the calculation of financial distress predictions is indicative of the evolution of economics to continue to produce new or renewable results.

2. Literature Review

2.1 Trade Off Theory

In 1958, the seminal Trade Off Theory was initially formulated by Modigliani and Miller, proposing that the capital structure of a firm is not influenced by market conditions and does not affect its value. Subsequently, in 1963, the prevailing theory underwent a revision, asserting that indebtedness confers tax advantages, thereby prompting corporate entities to optimize their capital structure by taking into account tax shields and bankruptcy costs (Khoa & Thai, 2021). In considering the relationship between risk and return in this theory, an increased level of debt would lead to an increased risk borne by shareholders. Furthermore, the debt used to increase the rate of return is also expected to increase.

This study employs Trade Off Theory to elucidate the impact of the DER variable on the prediction of financial distress, which posits that increasing debt levels correspond to higher interest expenses and, thus, heightened risk of financial distress. To circumvent this predicament, the company will balance the benefits of debt and the risk of bankruptcy due to debt (Umdiana & Nurjanah, 2020). Conversely, if the debt is excessive, the cost of bankruptcy escalates to the point of becoming inefficient and endangering the company's financial stability. It is imperative for companies to thoroughly examine the theoretical underpinnings of debt financing and its purported tax advantages, while also taking into account the potential financial obligations it might incur.

2.2 Financial Distress

Financial distress is used as an effort to prevent a worse state of the company before the unwanted thing happens (Dirman, 2020). Financial distress provides a set of symptoms that may be observed, such as a significant decline in recurring profits and a decrease in the company's share price. Nevertheless, it is crucial to acknowledge that not all instances of bankruptcy are attributable to financial distress, and conversely, financial distress does not invariably result in bankruptcy. This predicament arises from the company's inability to execute its operations, such as lack of funds, lack of a market that is the main consumer, and the company's inability to manage the company's resources, so it also has an impact on external parties, such as investors (as evidenced by the decreasing number of issuers) and consumers, who feel that the company is not as productive as before (Baros et al. 2022).

Some of the factors that cause financial distress are general factors, which include the economic sector, government sector, social sector, and technology sector. Then external factors, which include factors from consumers themselves, creditor factors, investor factors, and company competitor factors. And the last is internal factors, this problem cause more

focus on bankruptcy from within the company, such as credit delinquency experienced by the company, inefficient company management thus it can not release the potential of its resources, and an unhealthy work environment between employees. The occurrence of any of these factors over an extended period is indicative of the likelihood of financial distress (Kliestik et al., 2020).

2.3 Springate S-Score Model

As a model for the prediction of the occurrence of financial distress phenomena, the Springate S-score has been employed. The Springate model was first presented in 1978 by Gordon L. V. Springate, subsequent to the Multiple Discriminant Analysis (MDA) model developed by Altman Z-score model (1968) (Ambarwati and Sriwardany 2021). The Springate model has a decent accuracy of results because it has only two possibilities, the company is considered healthy or the company is considered unhealthy. Initially, 19 financial ratios were tested in the development of the Springate model, including various types of liquidity, leverage, profitability, efficiency, and market ratios. Eventually, 4 main ratios were obtained in the calculation of the Springate model. These four main ratios have become known as the S-score (Muzanni and Yuliana 2021) with the use of the formula:

$$S = 1{,}03A + 3{,}07B + 0{,}66C + 0{,}4D$$

With the information:

S = overall or bankruptcy index

A = working capital / total asset

B = earnings before interest and taxes / total asset

C = earnings before taxes / current liabilities

D = sales / total asset

The classifications determined by the Springate model are as follows:

S-score > 0.862 indicates that the company has no potential for bankruptcy.

S-score < 0.862 indicates that the company is financially unhealthy and has a potential for bankruptcy.

2.4 Liquidity Ratio

A company's liquidity ratio is defined as the proportion of its short-term debts to total assets. The purpose of this ratio is to offer an assessment of the ability of companies with substantial asset bases to meet their short-term obligations. Higher values of the liquidity ratio are indicative of a higher company value in terms of its ability to pay its short-term debt. (Buntu, 2023) posits that there are three distinct categories of liquidity ratios: namely, the current ratio, the quick ratio, and the cash ratio. The liquidity ratio employed in this study to measure financial distress using the Springate model is the current ratio (CR). It is imperative to note that the current ratio is a liquidity ratio whose purpose is to evaluate a company's capacity to settle current liabilities held within a year using current assets, such as cash, accounts receivable, and inventory. This ratio is used to compare the total current assets of a

company with its total current liabilities. The current ratio was chosen because this ratio can maximize the current assets recorded so that it is intended to be able to meet all current liabilities. The formula used to calculate this ratio is (Atang et al., 2022):

CR = (current assets)/(current liabilities) x 100%

2.5 Leverage Ratio

The leverage ratio is a tool used to assess the financial health of a company, measuring the amount of debt used to finance its assets. This ratio is a measure of the extent to which a company uses debt to finance its operations compared to the use of its own capital. As the level of leverage rises, so too does the uncertainty surrounding returns (Buntu, 2023). In this particular instance, the primary objective of leveraging debt as a financial instrument is to optimise the tax shield and mitigate potential risks. Consequently, the utilisation of debt is regarded as reasonable, provided that its application remains optimal. The following leverage ratios have been identified: the debt-to-assets ratio (DAR), the debt-to-equity ratio (DER), the debt-to-capital ratio, and the debt-to-EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) ratio (Ciptawan & Angeline, 2023). The debt-to-equity ratio (DER) denotes a key metric in the context of financial analysis, utilised to evaluate a company's financial health. With regard to the leverage ratio, the debt-to-equity ratio (DER) is a critical component. The latter is a measure of the proportion of a company's assets financed by debt compared to equity. This suggests that as the DER increases, the probability of encountering financial distress also rises in proportion. A higher DER leads to increased interest expenses and obligations, which can result in a heightened risk of financial distress. The following formula is employed to calculate the ratio of debt to equity (Lucky & Michael, 2019):

DER = (total debt)/(total equity) x 100%

2.6 Profitability Ratio

Profitability ratio is defined as the company's ability to generate profits by utilizing all existing capabilities and resources, including sales activities, cash, capital, and the number of employees. The efficacy of a company's management can be assessed by this ratio (Baros et al., 2022). A total of nine types of profitability ratios have been identified, comprising four ratios of net profit margin (NPM), gross profit margin (GPM), return on assets (ROA), and return on equity (ROE). Return on assets (ROA) is a tool used to assess the percentage of profit to total assets owned by the company. In selecting an indicator of the company's financial performance in generating profits from its assets, the return on assets (ROA) ratio was selected. An elevated return on assets (ROA) signifies that a corporation's financial performance is favorable. The ability of the company to withstand various financial challenges, including financial distress, is indicative of its financial resilience. To calculate return on assets, use the formula as (Sariroh, 2021):

ROA = (net income)/(total assets) x 100%.

2.7 Conceptual Framework

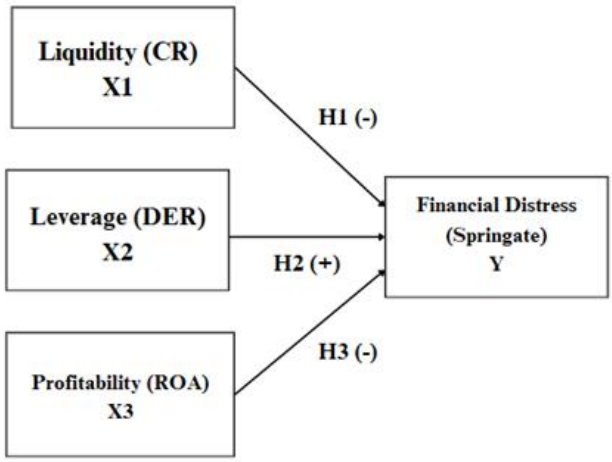

Figure 2. Conceptual Framework

This study used three independent variables: liquidity ratio, leverage ratio, and profitability ratio. Furthermore, X1 as liquidity ratio uses current ratio (CR), X2 as leverage ratio uses debt to assets ratio (DER), and X3 as profitability ratio uses return on assets (ROA). Y, the dependent variable in this study, utilises the Springate financial distress calculation. The three independent variables are selected according to the relationship among these variables and the dependent variable. The expectation is that the results obtained will satisfy several hypotheses as stated.

2.8 Hypothesis

H1: Liquidity ratio has a negative and significant effect on financial distress

Liquidity ratios can affect the financial distress condition of a company when the value of this ratio is low, the first symptoms that can be marked are delays in salary payments, interest installments and other short-term obligations. This is because the liquidity ratio measures the company's ability to pay its short-term obligations. In other words, if short-term obligations cannot be met, then long-term obligations will not be paid at all, so the assessment of this ratio is often used as a benchmark in the early signs of a company's condition, including the measurement of financial distress. The hypothesis is to be considered fulfilled if the value of the liquidity ratio is negative and does not exceed 0.05 ($n < 0.05$). In the event that these criteria are met, H1 is accepted.

The research by (Jessie & Tannia, 2024) indicates that liquidity ratios negatively impact companies. High liquidity helps cover current liabilities, making companies less vulnerable to financial distress. (Ciptawan & Angeline, 2023) also support this, showing that a higher Current Ratio suggests improved liquidity, reducing financial distress risk. Additionally, (Kisman & Krisandi, 2019) found that profitability ratios negatively predict financial distress. Excessively high Current Ratio values may signal suboptimal asset usage, indicating too much cash on hand.

H2: Leverage ratio has a positive and significant effect on financial distress

The second issue to be addressed is the impact of the leverage ratio on the calculation of the conditions of financial distress. The presence of a high leverage ratio may be indicative of a significant debt burden, which can result in increased interest expense and elevated financial distress. This phenomenon is ascribed to the fact that the leverage ratio itself is recognised as a metric that signifies the extent to which a company is financed by debt in order to sustain its daily operations. In order for the hypothesis to be considered fulfilled, it is necessary that the value of the leverage ratio is positive and does not exceed 0.05 ($n < 0.05$). In the event that these criteria are met, H2 is accepted.

Research by (Lucky & Michael, 2019) shows that the leverage ratio positively affects financial distress. This is linked to the high correlation between government debt financing costs and borrowed funds' interest rates. (Giarto & Fachrurrozie, 2020) support this, stating that a higher leverage ratio increases the risk of repayment issues. When a company's liabilities exceed its assets, it relies heavily on borrowed funds. (Dwiantari et al. 2021) also confirm that a higher leverage ratio increases the potential for financial distress.

H3: Profitability ratio has a negative and significant effect on financial distress

In addition, the X3 profitability ratio is a measure of a company's capability to make profits from its operating income, so the sign of financial distress in this ratio is characterized by a low profitability value. This low value is feared to make negative cash flow, so it triggers a financial distress condition (Sariroh, 2021). The hypothesis is to be considered fulfilled if the value of the profitability ratio is negative and does not exceed 0.05 ($n < 0.05$). In the event that these criteria are met, H3 is accepted.

This hypothesis is supported by (Agil Krisna Rivanda, Kurnia Fajar Afgani, Radia Purbayati, & Marziana Madah Marzuki, 2023) through research showing that profitability ratios significantly affect predicting financial distress. The study indicates that the risk of financial distress correlates with the Return on Assets ratio, which decreases as financial distress increases, suggesting that net profit growth is small in the companies studied. (Fatimah et al. 2019) also found that profitability ratios negatively impact financial distress. Effective standards can reduce company financing needs, allowing for sufficient funds to minimize financial distress. Additionally, (Fadlillah, 2019) noted that a higher profitability

3. Research Methodology

3.1 Population

Population can be defined as all objects or subjects in the research target that meet certain conditions and characteristics (Candra Susanto, Ulfah Arini, Yuntina, Panatap Soehaditama, & Nuraeni, 2024). All companies in the non-cyclical sector listed on the Indonesia Stock Exchange in 2020-2024 are used as the population for this study. The general geographical location is in all non-cyclical companies in the country of Indonesia, with the placement of a four-year period, that is, 2020-2023. The population of non-cyclical companies

was chosen because this field has experienced progress and a fairly rapid increase in the number of companies in the last four years. In the data shown in the Indonesia Stock Exchange alone, there were 125 non-cyclical companies listed in 2023. The robust expansion of non-cyclical companies coincides with the increasing symptoms of financial distress, as the companies listed in 2023 are new companies, while the old companies previously listed in 2020 and 2021 have failed to maintain their existence in the Indonesian capital market. The decline of these companies was caused by lower profits, which are lower than the minimum requirements set by the Indonesia Stock Exchange.

3.2 Sample

Based on certain criteria, a sample is a portion of the total population selected for analysis. The sample is considered through several provisions underlying the research, such as the consideration of the problem to be studied, the objectives to be achieved in the research, the various hypotheses devoted to the research and the methods used during the research (Purwanza et al., 2022), The samples were taken using the Purposive Sampling technique, where the samples were selected based on the required criteria.

Table 1. Table of Total Sample

Criteria Sample	Year through 2020-2023				Total
	2020	2021	2022	2023	
Non-cyclical sample companies listed on the Indonesia Stock Exchange	63	98	113	125	399
Non-cyclical sample companies that have positive profit increases for two consecutive years	(21)	(36)	(50)	(30)	(137)
Non-cyclical sample companies that do not include annual financial statements	(2)	(8)	(10)	(20)	(40)
TOTAL SAMPLE	40	54	53	75	222
Non-cyclical sample companies that became outliners after testing on Eviews	(13)	(19)	(18)	(21)	(44)
TOTAL SAMPLE	30	41	37	70	151

The objects used in this study are companies in the mining sector listed on the Indonesia Stock Exchange (IDX). The observation time span used in this study covers a four-year period, namely in 2020-2023. The type of data used in this study is secondary data. The secondary data used comes from the annual reports of mining companies listed on the IDX for the 2020-2023 period. Data analysis in this study uses multiple linear regression models, which are carried out with the help of SPSS (Statistical Product and Service Solutions) software. A series of classical assumption tests will be carried out first, including normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test. Next, regression analysis will be conducted to test the hypothesis. Hypothesis testing includes the classical assumption test, coefficient of determination (R2), t statistical test.

4. Research results

4.1 Research results

The results obtained after predicting the financial distress of non-cyclical companies using the Springate model can be described in the following table:

Table 2. Table After Predicting the Financial Distress

Description	Total Sample	Percentage (%)
Companies predicted to be in financial distress	108	48,65%
Companies predicted not to be in financial distress	114	51,35%
TOTAL	222	100%

The research results still use 222 samples instead of 151 samples. This follows the original number of samples before removing outliers when using Eviews for research tests. Out of the results, 108 companies showed symptoms of financial distress with an S-score < 0. 862: 20 in 2020, 24 in 2021, 26 in 2022, and 38 in 2023. Meanwhile, 114 companies with an S-score > 0. 862 showed no symptoms of financial distress, detailed as follows: 20 in 2020, 30 in 2021, 27 in 2022, and 37 in 2023.

4.2 Descriptive Statistical Analysis

	CR	DER	ROA	FINANCIAL_DISTRESS
Mean	2.457141	2.055636	0.420432	1.122901
Median	1.640991	0.859125	0.018763	0.871583
Maximum	21.50400	54.97976	81.57850	6.440542
Minimum	0.000221	-4.862583	-1.235372	-2.024599
Std. Dev.	2.917249	5.176415	5.495727	1.319882
Skewness	3.342106	6.558535	14.61368	1.048615
Kurtosis	16.76010	57.03131	216.1811	5.174125
Jarque-Bera	2164.675	28595.82	428278.9	84.40806
Probability	0.000000	0.000000	0.000000	0.000000
Sum	545.4853	456.3513	93.33579	249.2839
Sum Sq. Dev.	1880.785	5921.754	6674.867	385.0015
Observations	222	222	222	222

Figure 3. Table of Descriptive Statistical Analysis Results

Source: Eviews 10 (2025), data processed by author

Based on the descriptive tests carried out, the results obtained on the variable Current Ratio (CR) have 2.457141 as the average value and 2.917249 as the standard deviation. The standard deviation value indicates a substantial variation among companies, suggesting significant differences in their performance metrics. The minimum value of 0.000221 is observed to be held by the company PT. Austindo Nusantara Jaya Tbk (ANJT) in 2023, and on the other hand, the maximum value was obtained by the company PT. Estee Gold Feet Tbk (EURO) in 2023 with a value of 21.50400. With the median value of CR, the liquidity ratio value is considered good because the amount of good CR value is $1.5 \leq CR \leq 3$. However, there is a minimum value with a very low value which is below 0.05 ($n < 0.05$), which is very contrasting when compared to the maximum value which reaches 21. The majority of companies exhibit a good level of liquidity, with a median value of 2.457141. However, a number of companies demonstrate a CR value that falls below 1, even almost close to 0, indicating difficulties in paying short-term liabilities. In contrast, some companies

have CR values above 10 and some even touch the number 21, indicating the existence of non-optimized current assets owned.

The variable Debt to Equity Ratio (DER) has an average value of 2.055636 with a standard deviation of 5.176415. The minimum value is -4.862583 which is expected by PT. Estika Tata Tiara Tbk (BEEF) in 2021, reflecting a very low value touching negative numbers. Meanwhile, the maximum value is obtained by the company PT. Wicaksana Overseas International Tbk (WICO) in 2023 with a value of 54.97976, very high compared to the minimum value which reaches a negative number. A good average leverage ratio value is usually $0.5 \leq DER \leq 2$, thus the very large gap between the minimum and maximum value indicates that the capital structure is quite risky with a high level of debt so that it is inversely proportional to the equity owned and shows a rather worrying average value of 2.055636. This is in line with the standard deviation value, which shows a large gap between companies. It can be concluded that the leverage values obtained after the descriptive test are dangerous, with some companies having extreme debt that poses a financial threat to them.

Furthermore, the variable Return on Assets (ROA) has an average value of 0.420432, which is the smallest among the other variables, and 5.495727 standard deviation. At the minimum, it has a value of -1.23537232, specifically in the company PT. Campina Ice Cream Industry Tbk (CAMP) in 2021. The maximum value is indicated by a value of 81.57850 in the company PT. Darya Varia Tbk (DVLA) in 2020, indicating a remarkably high profitability ratio value. The average value of good profitability ratio is $5\% \geq ROA \geq 20\%$ and the maximum value exceeds these results ($n > 20\%$). Although the average value of ROA, which is 0.420432 (4.2%), is less than 5%, it is still quite good because it means that the sample companies earn a profit of 4.2% of their total assets. While some companies have negative ROA values, this means that these companies are incurring losses that also result in low ROA values.

The mean of the financial distress variable is 1.22901 with 1.319882 as its standard deviation. The minimum value recorded was -2.024599, with a maximum value of 6.440542. In the listed table, the average value results show results closer to 1 than 0 ($1.22901 > 1$), It has been asserted that the utilization of data samples does not incur financial distress on an aggregate basis. Moreover, all data samples are classified as financially viable.

4.3 Classical Assumption Test

4.3.1 Normality Test (Normally Distributed Residuals)

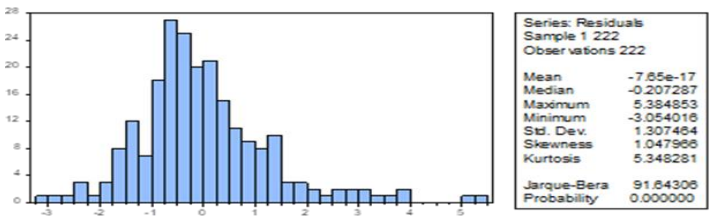

Figure 4. Table of Normality Test Results 1

Source: Eviews 10 (2025), data processed by author

Using the Jarque-Bera Test method, normality test results show a p-value of 0.000, indicating a very low value that is less than 0.05 (n < 0.05) and suggesting a non-normal distribution of data. To obtain the required p-value results, data transformation is performed on the sample used, by transforming to logarithmic form on CR, DER, ROA and financial distress variables. Previously, financial distress was not transformed into logs, yet the p-value obtained was still 0.000, indicating the necessity for log transformation. One of the studies that explore logarithmic transformation scientifically, with emphasis on research tests conducted on sample data, is (Tuvadaratragool, 2023)'s study. The resulting description based on the test discusses changes in logarithmic transformation in the variables of net profit margin, total asset turnover, equity multiplier, and return on equity.

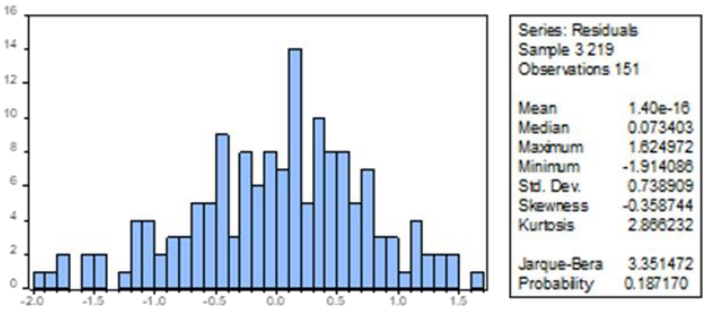

Figure 5. Table of Normality Test Results 2

Source: Eviews 10 (2025), data processed by author

The results obtained after transforming the data of the tested sample are shown in the table above. It has been determined that the p-value has increased to 0.187170, which indicates that after the previous data transformation of the tested sample, the data are normally distributed. Because the sample data is normally distributed, it can be used in parametric statistical analysis.

4.3.2 Heteroscedasticity Test

Heteroskedasticity Test: White

F-statistic	1.192125	Prob. F(9,141)	0.3046
Obs*R-squared	10.67756	Prob. Chi-Square(9)	0.2985
Scaled explained SS	9.442535	Prob. Chi-Square(9)	0.3975

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/08/25 Time: 10:22
Sample: 3 219
Included observations: 151

Figure 6. Table of Heteroscedasticity Test Results

Source: Eviews 10 (2025), data processed by author

Heteroscedasticity test results are obtained using the White Test model by analyzing the results of the Obs*R-squared with prob. Chi-Square. There is no heterocedasticity if the value 0.05 is less than the p-value (p-value > 0.05). Plotting the results presented in the figure reveals that the p-value of 0.2985 satisfies 0.05 (0.2985 > 0.05), indicating that heteroscedasticity is not a factor and the regression coefficient is therefore deemed valid.

4.3.3 Multicollinearity Test

Variance Inflation Factors
Date: 04/08/25 Time: 10:29
Sample: 1 222
Included observations: 151

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.020456	5.544328	NA
LOG_CR	0.005333	2.054862	1.497607
LOG_DER	0.005572	1.792340	1.495503
LOG_ROA	0.001158	4.664400	1.053904

Figure 7. Table of Multicollinearity Test Results

Source: Eviews 10 (2025), data processed by author

A favourable multicollinearity test result is when multicollinearity is absent in the tested regression model. The VIF (Variance Inflation Factor) Test model was selected for the test because it yielded more accurate results than the Correlation Matrix Test. The criteria include two stipulations, namely a Uncentered VIF and Centered VIF. In the above table, the Uncentered value of CR is 2.054862, DER is 1.792340, and ROA is 4.664400. This investigation revealed that there is no multicollinearity in the data sample tested, since the value is less than 10 (p-value < 10).

4.4 Regression Analysis

4.4.1 F Test (Simultan)

R-squared	0.069930	Mean dependent var	0.100592
Adjusted R-squared	0.050949	S.D. dependent var	0.766184
S.E. of regression	0.746410	Akaike info criterion	2.279050
Sum squared resid	81.89787	Schwarz criterion	2.358978
Log likelihood	-168.0683	Hannan-Quinn criter.	2.311521
F-statistic	3.684201	Durbin-Watson stat	1.631317
Prob(F-statistic)	0.013509		

Figure 8. Table of F Test Results

Source: Eviews 10 (2025), data processed by author

The F test can show if the independent variable significantly affects the dependent variable. A good outcome is a p-value under 0.05. Further analysis of the results indicates a p-value of 0.013509, confirming the F Test's success with a value below 0.05 (0.013509 < 0.05) and demonstrating the regression model's feasibility in explaining the effect of the independent variable on the dependent variable. As the F test demonstrates, the independent variables have a significant effect on the dependent variable, financial distress.

4.4.2 T Test (Partial)

Dependent Variable: LOG_FINANCIAL_DISTRESS
Method: Least Squares
Date: 04/08/25 Time: 10:31
Sample (adjusted): 3 219
Included observations: 151 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.372728	0.143026	2.606027	0.0101
LOG_CR	-0.056487	0.073029	-0.773485	0.4405
LOG_DER	-0.128137	0.074649	-1.716518	0.0882
LOG_ROA	0.086638	0.034027	2.546139	0.0119

Figure 9. Table of T Test Results

Source: Eviews 10 (2025), data processed by author

Use of the T Test is a common practice in order ascertain links between either the independent variable and the dependent variable. Requisite T test results are indicated by a p-value that is less than 0.05 (p-value < 0.05). This finding suggests a substantial impact of the independent variable on the dependent variable. The CR variable had a p-value of 0.4405 with a negative coefficient, and the DER variable showed a p-value of 0. 0882 with a negative coefficient. The ROA variable had a p-value of 0.0119 with a positive coefficient, indicating a strong positive influence on predicting financial distress, supporting the hypothesis. The end result is positive, not negative.

5. Discussion

5.1 Liquidity ratio effect on financial distress

Using Eviews, the study found that the Current Ratio exhibits a negative effect on financial distress, though this is not significant for forecasting purposes. The p-value of 0.4405 is above 0.05. The regression coefficient is -0. 056487, showing that a 1 decrease in the Current Ratio leads to a -0.056487 unit decrease in financial distress. Consequently, the first hypothesis (H1) is partially rejected. Increased liquidity relates to reduced financial distress, aligning with previous studies. An increase in the liquidity ratio in the study sample leads to a decrease in financial distress conditions. This study's findings match those of other studies by (Dianova & Nahumury, 2019), (Dewi et al. 2021), and (Agil Krisna Rivanda et al., 2023).

The liquidity ratio exerts a negligible influence on the probability of financial distress for a number of reasons. A higher liquidity ratio in the data does not greatly lower the chance of financial distress. The stability of cash flows in non-cyclical companies, where changes in liquidity have minimal impact, could be a contributing factor. These findings may also suggest inadequate cash management, as elevated current assets may not be employed in an effective manner to avert financial distress.

5.2 Leverage ratio effect on financial distress

The T Test results concerning the Debt to Equity Ratio reveal a p-value of 0.0882 and a regression coefficient of -0.128137, suggesting a negative correlation with financial distress. Since the p-value exceeds 0. 05, it can be concluded that the leverage ratio does not have a

significant impact on financial distress. Consequently, hypothesis H2 rejects that the leverage ratio does not have a significant effect on financial distress. These findings align with studies by (Finishtya, 2019), (Stepani & Nugroho, 2023), and (Khafid et al. 2019), which had similar results.

The leverage ratio is not strongly negative due to various factors. One factor is the poor management of current assets like cash and receivables. These assets continue to accumulate and are not managed in an effective way, so even though the value of the liquidity ratio is high, it does not really prove the ability to avoid financial distress. Therefore, effective current asset management, debt structure, and profitability are more important for assessing a distressed company's financial health.

5.3 Profitability ratio effect on financial distress

An examination of the findings indicated that the Return on Assets exhibited a substantial positive influence on financial distress, yielding a p-value of 0.0119 and a regression coefficient of 0.086638. Hypothesis 3 (H3) proposes a positive relationship between the profitability ratio and financial distress, which is partially supported. The results align with previous studies by (Giovanni et al. 2020), (Sholikah & Khoiriawati, 2022), and (Aslamiah et al. 2023). A higher profitability ratio is linked to more signs of financial distress, agreeing with the idea that a low profitability ratio signals financial problem. Higher profitability ratios indicate more financial distress symptoms. This aligns with the theory that a negative profitability ratio shows financial distress, suggesting efficiency in profit and asset generation.

In the sample companies examined, the profitability ratio value is found to be positive due to several conditions. One such condition could be the presence of a high profitability ratio that is deemed unsustainable, possibly resulting from temporary gains or the sale of assets to offset losses when the company's actual condition is suboptimal. Financial distress may also arise due to factors other than those examined in this study, such as the instability of the sample companies in the field.

6. Conclusions And Suggestion

6.1 Conclusion

In the development of financial science, non-cyclical companies are one of the interesting objects of study. Furthermore, the prediction of financial distress remains a subject of perpetual interest to researchers, encouraging ongoing investigation and further study. Utilizing the Springate model as a methodological framework, this analysis thoroughly investigates how liquidity, leverage, and profitability ratios influence the onset of financial distress. Findings from a sample of 178 non-cyclical companies listed on the Indonesia Stock Exchange between 2020 and 2023 validate just one hypothesis: the profitability ratio, indicated by Return on Assets, exhibits a positive and significant correlation with financial

distress. Conversely, the liquidity ratio and the leverage ratio were found to be non-significant in this context. It is imperative to acknowledge that this finding is not conclusive and may not necessarily reflect the reality of the situation on a broader scale. Such conclusions are indicative of the repression of this research, primarily due to the restricted sample of non-cyclical companies, a constrained time period for the research on the sample, and the incorporation of alternative financial ratios as the variables of study, serve as a contributing factor to these findings.

6.2 Suggestion

The study's results indicate that the main role of managers is to maintain the stability of the liquidity and leverage ratios to reduce the risk of financial distress. Efficient management is crucial for executing successful financial management strategies, such as cash management, and for routinely evaluating the company's debt structure.

In future research on the same dependent variable, financial distress, it is hoped that researchers will use one of the financial distress calculation models, namely the Altman Z-score model, the Springate model, the Zmijewski model, and the Grover model. Consequently, future research samples will no longer be constrained to non-cyclical sectors. A multitude of other sectors can be utilized as research objects to predict financial distress conditions. In addition, the utilization of alternative ratios as independent variables is recommended, including growth ratios, investment ratios, and activity ratios.

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