

Liquidity, Leverage, Profitability, and Financial Distress: Firm Size as a Moderating Variable

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Abstract—This study examines the effects of liquidity, leverage, and profitability on financial distress and tests firm size as a moderating variable in property and real estate companies listed on the Indonesia Stock Exchange (IDX) during 2021–2025. Using an associative quantitative design, 55 companies were selected through purposive sampling, yielding 275 firm-year observations obtained from financial statements published on the official IDX website. Financial distress was measured with the Zmijewski X-score, liquidity with the current ratio (CR), leverage with the debt-to-equity ratio (DER), profitability with return on assets (ROA), and firm size with the natural logarithm of total assets. The data were analysed using descriptive statistics, classical assumption tests, multiple linear regression, and moderated regression analysis (MRA) in EViews 13. The results show that liquidity has a significant negative effect on financial distress ($\beta = -0.004$; $p < 0.05$), leverage has a significant positive effect ($\beta = 5.700$; $p < 0.05$), and profitability has a significant negative effect ($\beta = -4.500$; $p < 0.05$). Firm size significantly moderates the effects of liquidity ($\beta = -0.0002$; $p = 0.016$), leverage ($\beta = 0.207$; $p < 0.001$), and profitability ($\beta = -0.195$; $p < 0.001$) on financial distress and strengthens each relationship. The novelty of this study lies in testing firm size as a moderator of three financial ratios simultaneously in the post-pandemic property sector. The findings provide an early-warning basis for managers, creditors, and investors, while future research is suggested to add non-financial variables, other sectors, and a longer observation period.

Keywords: Financial Distress; Liquidity; Leverage; Profitability; Firm Size

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1. INTRODUCTION

Financial distress describes a condition of deteriorating financial performance, defined by a business's incapacity to fulfil its immediate and long-term financial commitments. This condition is an early warning of approaching bankruptcy (Saraswati, Ratnawati, & Irawan, 2024). Amid post-pandemic economic uncertainty and business pressures, the performance of companies listed on the Indonesia Stock Exchange (IDX) has significantly declined, which may raise the risk of financial trouble in a number of industries (Chrissentia & Handoko, 2025).

Financial distress not only impacts a company's operational sustainability but also affects the confidence of investors, creditors, and other stakeholders. Therefore, identifying its underlying causes is crucial as a basis for forecasting financial conditions and making strategic decisions. In financial analysis, this condition is typically measured using models such as the Z-score or other approaches that combine different financial ratios to evaluate the financial well-being of a business. In the Indonesian property sector, the Zmijewski model has been used to trace distress trends before and during the pandemic (Saraswati, Ratnawati, & Irawan, 2024).

Several previous studies on financial distress have typically analyzed internal corporate factors related to finance, particularly liquidity, leverage, and profitability (Akashi, 2025; Aulia & Fauzan, 2025; Suyono et al., 2024). The ability of a business to fulfil its short-term obligations is known as liquidity, and weak liquidity frequently results in payment issues and a higher risk of financial trouble. Leverage shows how much a business depends on debt-based funding; as a result, a rise in debt can make financial strain worse. Profitability, on the other hand, is a measure of a business's capability to make money, which is typically associated with its ability to preserve financial stability and reduce the danger of financial distress.

Previous empirical research has examined the impact of these factors on financial distress, with differing results. Some studies report that liquidity and profitability reduce financial distress, whereas leverage increases it (Adityaningrum, Widyaningrum, & Mahirun, 2024; Khoiriyah & Amaliyah, 2024). However, other studies have found no significant effects for some variables Hakim et al. (2022) and Pratiwi & Sudiyatno (2022), indicating the possibility of external or conditional factors influencing these relationships.

One variable that may explain the variation in this relationship is firm size. Firm size, as determined by total assets, can reflect the scale and capacity of a firm's resources. Generally, larger firms have better access to financing and resources when facing financial challenges. Nevertheless, research findings on the connection between firm size and financial distress remain inconsistent Andaris & Dasman (2024); Chrissentia & Handoko (2025); Safitri & Ibrahim, (2026), necessitating further study on the role of firm size in the connection between financial factors and financial distress.

Firm size is positioned as a moderator that influences how strongly or weakly independent factors affect financial distress. In keeping with current research trends that examine the intricate interconnections among financial variables, it is hoped that by incorporating this moderator variable, we might obtain a clearer understanding of the mechanisms underlying the occurrence of financial hardship.

According to previous research, many studies on financial distress still focus on the direct effects of financial factors, such as liquidity, leverage, and profitability. Recent studies in the property and real estate sector, for example, examined only direct effects (Hakim et al., 2022; Saraswati et al., 2024; Suyono et al., 2024). There are still relatively few studies exploring how firm size can influence the strength of the relationship between these factors and financial distress, especially among businesses in the real estate and property industries that are listed on the Indonesia Stock Exchange. There is a study gap that needs to be filled because of inconsistencies in the findings of earlier studies and the limitations of analyses concerning the function of firm size as a moderating variable.

Financial distress is the state in which a business's operating cash flow is not sufficient to cover its obligations (Rahardjo & Nariman, 2025). According to financial theory, a company's inability to effectively manage its financial resources is indicated by financial hardship. Therefore, in order to reduce the risk of bankruptcy, early detection of this condition is essential (Saraswati et al., 2024).

In reality, bankruptcy prediction models, such as the Altman Z-Score and the Zmijewski model, which combine different financial ratios to determine a company's financial health, are commonly used to measure financial hardship (Zmijewski, 1984). These models are popular in empirical research because they provide a comprehensive analysis of financial conditions. Studies by Akashi (2025) and Adityaningrum, Widyaningrum, & Mahirun (2024) reveal that financial distress is triggered by internal company factors, particularly aspects of financial performance such as liquidity, leverage, and profitability. This indicates that financial ratio analysis remains a crucial method for identifying potential financial distress.

Liquidity shows whether a business has sufficient current assets to cover its maturing obligations (Khoiriyah & Amaliyah, 2024). Financial management theory states that a company's ability to pay its debts on schedule is a sign of excellent financial protection. On the other hand, limited liquidity can cause financial difficulties and distress. Numerous empirical investigations have discovered a negative correlation between financial distress and liquidity: the higher the liquidity, the lower the risk. For instance, studies by Akashi (2025), Saraswati et al. (2024), and Khoiriyah & Amaliyah (2024) demonstrate that liquidity significantly affects financial distress. However, Khansa, Nugroho, and Nurcahyono (2022) found no effect of liquidity, while Ayem and Sogen (2024) reported a positive effect, showing that liquidity may not always reduce distress depending on the circumstances or other contributing elements.

The ability of a business to pay back its debts is a common definition of leverage (Frederica & Lukman, 2021). Excessive debt can raise financial risk because of the fixed interest payments that must be made, according to capital structure theory. Financial trouble is also more likely if cash flow is inadequate. Consequently, there is frequently a positive correlation between leverage and financial difficulty. According to studies by Adityaningrum et al. (2024), Khansa, Nugroho, & Nurcahyono (2022), and Wulandari and Jaeni (2021), leverage significantly increases financial distress. In contrast, Ayatika, Suryaningprang, Herlinawati, Sudaryo, and Supiyadi (2024) reported a negative effect and Hakim et al. (2022) found no significant effect; to completely comprehend this relationship, more research is necessary.

A company's capacity to turn a profit at a particular level of sales, assets, and equity is measured by its profitability (Aulia & Fauzan, 2025). Profitability and financial difficulty are negatively correlated; businesses with high profits are generally less vulnerable because profit can be used to pay financial responsibilities. Profitability has no bearing on financial distress, according to studies by Wulandari & Jaeni (2021), Adityaningrum et al. (2024), and Aulia & Fauzan (2025). Nonetheless, profitability significantly reduces financial strain, according to Khansa et al. (2022) and Chrissentia & Handoko (2025). According to Lina, Agustawan, and Putri (2022), firm size is a measure of how large or small a firm is, which is generally proxied by total assets. Large companies have easier access to funds, broader business diversification, and more mature management, making them more resilient in facing financial challenges compared to small-scale businesses. According to Safitri & Ibrahim (2026), there is a negative correlation between financial distress and firm size. In the meantime, studies by Chrissentia & Handoko (2025) and Aulia & Fauzan (2025) show a positive correlation between these two variables. However, studies by Andaris & Dasman (2024) and Nurkhasannah and Nawirah (2025) discovered that firm size has no bearing on financial distress.

In this study, firm size is used to demonstrate that it influences the correlation between liquidity, leverage, and profitability with financial distress. This approach stems from inconsistencies in previous research, where the relationship among financial variables was not always clear. Through this moderation analysis, this study aims to uncover the mechanisms of financial distress more clearly.

According to earlier studies, financial difficulty is frequently explained by elements like profitability, liquidity, and leverage. Rahmadianti and Asyik (2021) found that firm size weakens the effects of liquidity and leverage on financial distress. Khoiriyah & Amaliyah (2024) discovered that while sales growth has no bearing on financial distress, liquidity and leverage do. Adityaningrum et al. (2024) showed that while profitability has no discernible impact on financial distress, liquidity, leverage, business size, and retained earnings do. However, Akashi (2025) found that while profitability, leverage, and business size do not demonstrate a substantial impact on financial distress, liquidity does. Aulia & Fauzan (2025) also reported different results, demonstrating that while profitability has no discernible impact on financial distress, leverage has a negative impact while liquidity and business size have a positive impact. Additionally, different research findings about the impact of liquidity, leverage, profitability, and business size on financial distress are presented by Suyono et al. (2024) and Rahardjo & Nariman (2025). In addition to financial factors, several studies have begun to consider firm size in explaining financial distress. Akashi (2025), Aulia & Fauzan (2025), Rahardjo & Nariman (2025) found varying results regarding the connection between firm size and financial distress, although their findings are not entirely consistent. Theoretically, larger firms generally have more resources, better access to financing, and greater

diversification capabilities, so they potentially have greater resilience to financial pressures. However, firm size can be understood not only as a factor that directly influences financial distress but also as one that potentially modifies the strength of the connection between a firm's financial condition and financial distress.

There is still a research gap, especially regarding firm size as a moderating influence. Firm size can moderate the relationship between liquidity, leverage, sales growth, and financial hardship, according to Khoiriyah & Amaliyah (2024). Additionally, Andaris & Dasman (2024) and Ayem & Sogen (2024) showed how business size influences the association between financial variables and financial distress, and Winarsih, Najmuddin, and Fuad (2026) found that larger firm size strengthens the role of operating capacity in mitigating financial distress. However, there is still a chance to look into how firm size influences the relationship between liquidity, leverage, and profitability in the context of financial distress, especially for real estate and property companies listed on the Indonesia Stock Exchange between 2021 and 2025. In order to better understand the factors driving financial hardship, this study employs business size as a moderating variable.

For businesses in the property and real estate industries listed on the Indonesia Stock Exchange between 2021 and 2025, this study intends to examine the impact of liquidity, leverage, and profitability on financial distress as well as explore the function of company size as a moderating variable. Theoretically, this study contributes to the financial distress literature by testing whether firm size conditions the effects of three financial ratios simultaneously in a sector that has been examined mainly through direct-effect models; practically, the findings offer useful guidance for stakeholders, investors, and management in recognizing and controlling financial risks.

2. RESEARCH METHODS

2.1 Research Design, Population, and Sample

This study uses an associative research design and a quantitative methodology, specifically aimed at testing how liquidity, leverage, and profitability influence financial distress, while also exploring the role of firm size as a moderating factor. The choice of a quantitative approach is considered appropriate because this study relies on quantitative data analyzed using statistical methods to verify the formulated hypotheses. The research was conducted on property and real estate companies listed on the Indonesia Stock Exchange, using secondary data in the form of annual financial statements downloaded from the official IDX website (www.idx.co.id) for the 2021–2025 period. The population comprises all 92 property and real estate companies listed on the Indonesia Stock Exchange during 2021–2025. The researcher used a purposive sampling technique to select the sample based on stringent criteria, such as companies that were regularly listed during the study period, published thorough financial reports on a regular basis, supplied information pertinent to the analysis, and had not had their shares delisted during the observation period. Sample selection is presented in Table 1.

Table 1. Sample Selection

Information	Amount
The number of companies in the property and real estate sector listed on the Indonesia Stock Exchange for the 2021–2025 period.	92
Companies that conducted an IPO on the Indonesia Stock Exchange prior to 2021	(15)
Companies delisted or placed under intensive monitoring by the Indonesia Stock Exchange during the 2021–2025 research period.	(22)
Amount	55

Table 1 shows that 55 companies met all sample criteria. With a five-year observation period, the study therefore uses 275 firm-year observations (55 companies × 5 years) as the unit of analysis.

2.2 Operational Definition of Variables

This study involves one dependent variable, three independent variables, and one moderating variable. The dependent variable is financial distress, measured using the Zmijewski model (Zmijewski, 1984), which combines profitability, leverage, and liquidity ratios into an X-score and has been applied to Indonesian property and real estate companies (Saraswati et al., 2024). A positive X-score indicates that a company is in financial distress, whereas a negative X-score indicates a financially healthy company. The independent variables are liquidity, leverage, and profitability, and the moderating variable is firm size. The operational definition and measurement of each variable are presented in Table 2.

Table 2. Operational Definition of Variables

Variable	Operational Definition	Measurement	Scale
Financial distress (Y)	A condition of declining financial health in which a company is unable to meet its obligations	Zmijewski X-score = $-4.3 - 4.5(\text{Net income/Total assets}) + 5.7(\text{Total liabilities/Total assets}) - 0.004(\text{Current assets/Current liabilities})$; $X > 0 =$ distressed	Ratio
Liquidity (X_1)	The ability of a company to meet its short-term obligations with current assets	$CR = \text{Current assets} / \text{Current liabilities}$	Ratio

Variable	Operational Definition	Measurement	Scale
Leverage (X_2)	The extent to which a company finances its assets with debt relative to equity	$DER = \text{Total liabilities} / \text{Total equity}$	Ratio
Profitability (X_3)	The ability of a company to generate profit from its total assets	$ROA = \text{Net income} / \text{Total assets}$	Ratio
Firm size (Z)	The scale of a company reflected by its total assets	$SIZE = \ln(\text{Total assets})$	Ratio

As shown in Table 2, all variables are measured on a ratio scale using data from the companies' financial statements. The hypothesized relationships among these variables are developed in the following subsection.

2.3 Research Hypotheses

Based on the theoretical review and previous studies described in the introduction, the hypotheses of this study are formulated as follows and summarized in the conceptual framework in Figure 1.

H1: Liquidity has a negative effect on financial distress.

Liquidity is the capacity of a business entity to fulfil its short-term financial obligations on time; companies with strong liquidity typically exhibit better financial health, allowing them to avoid the risk of serious financial problems; on the other hand, low liquidity increases the likelihood of financial distress. Prior research has found that liquidity has a negative effect on financial distress (Akashi, 2025; Saraswati et al., 2024).

H2: Leverage has a positive effect on financial distress.

Leverage indicates the proportion of debt financing a company allocates to its operations. When leverage is too high, interest expenses balloon and the risk of default increases, which can then trigger financial distress. Findings from previous studies also confirm that leverage contributes positively to the likelihood of financial distress (Adityaningrum et al., 2024; Khansa et al., 2022).

H3: Profitability has a negative effect on financial distress.

Profitability is a measure of how well a business makes money from its operations. Strong profitability usually makes it easier for businesses to pay their debts, which reduces the possibility of financial difficulties. On the other hand, businesses are more susceptible to financial difficulties if their profitability is low (Chrissentia & Handoko, 2025; Khansa et al., 2022).

H4: Firm size moderates the effect of liquidity on financial distress.

Company size is generally assessed based on total assets, which reflect the scale of operations (Lina, Agustawan, & Putri, 2022). Larger business entities tend to possess greater resource reserves, easier access to financing, and superior managerial capabilities. Consequently, the scale of business operations is considered to influence either strengthening or weakening the connection between financial factors and financial distress (Khoiriyah & Amaliyah, 2024; Rahmadiani & Asyik, 2021).

For instance, large companies tend to be more adept at managing current assets, thereby amplifying the positive impact of liquidity in mitigating financial distress.

H5: Firm size moderates the effect of leverage on financial distress.

Furthermore, large companies are also more adept at structuring their capital, which helps mitigate the negative impact of leverage on financial distress (Andaris & Dasman, 2024; Ayem & Sogen, 2024).

H6: Firm size moderates the effect of profitability on financial distress.

Moreover, large companies are generally more adept at generating and optimizing profits, making the impact of profitability on mitigating the risk of financial distress increasingly evident, although earlier evidence on this moderating role is still mixed (Ayem & Sogen, 2024; Rahmadiani & Asyik, 2021).

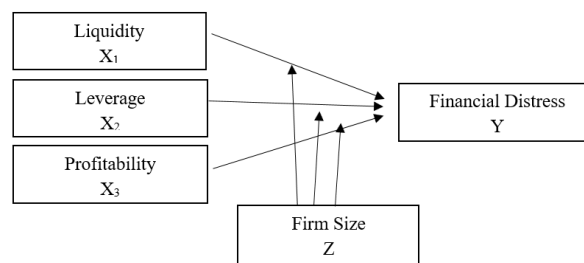


Figure 1. Research Conceptual Framework

Figure 1 shows that liquidity (X_1), leverage (X_2), and profitability (X_3) are expected to affect financial distress (Y) directly, while firm size (Z) is positioned as a moderating variable that may strengthen or weaken each of these effects.

2.4 Data Analysis Techniques

This study used a number of quantitative techniques, such as descriptive statistics, classical assumption tests, and multiple linear regression analysis, to analyze the data (Ghozali, 2021). Descriptive statistics serve to provide an initial summary

of the key attributes of the entire data set. The classical assumption tests conducted included evaluations of normality, multicollinearity, heteroscedasticity, and autocorrelation; all of these steps were intended to verify the suitability of the data for analysis using a regression model.

The impact of independent variables on financial hardship was then assessed using multiple linear regression analysis. When testing for moderating effects, the researchers included interaction terms, specifically the products of liquidity, leverage, and profitability with firm size, into the regression model (moderated regression analysis) (Ghozali, 2021). The t-test was used to measure each variable's partial effects, the F-test was used to analyze the combined effects of these factors, and the coefficient of determination (R^2) was used to gauge how well the model explained the dependent variable. All stages of data processing were supported by EViews 13 software to ensure more accurate and efficient results. The regression models are formulated as follows:

$$FD_{it} = \alpha + \beta_1 CR_{it} + \beta_2 DER_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \varepsilon_{it} \quad (1)$$

$$FD_{it} = \alpha + \beta_1 CR_{it} + \beta_2 DER_{it} + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5 (CR \times SIZE)_{it} + \beta_6 (DER \times SIZE)_{it} + \beta_7 (ROA \times SIZE)_{it} + \varepsilon_{it} \quad (2)$$

where FD is financial distress (Zmijewski X-score), CR is the current ratio, DER is the debt-to-equity ratio, ROA is return on assets, SIZE is the natural logarithm of total assets, i denotes the company, and t denotes the year. A hypothesis is accepted when the probability value of the corresponding coefficient is lower than the 5% significance level.

3. RESULTS AND DISCUSSION

3.1 Test Results

3.1.1 Descriptive Statistics

To give a summary of each research variable's features, descriptive statistics are employed. The mean, standard deviation, and lowest and maximum values are all included in this study. The standard deviation shows the degree of data dispersion, the minimum and maximum values show the lowest and highest values in the sample, and the mean provides the average value of the data (Ghozali, 2021). The results are presented in Table 3.

Table 3. Descriptive Statistics

	N	Descriptive Minimum	Statistics Maximum	Mean	St. Deviation
Liquidity	275	.030000	492.4100	12.19025	46.27427
Leverage	275	-76.75000	27.04000	.655855	5.215740
Profitability	275	-.125000	.428000	.024455	.060556
Financial Distress	275	-441.5970	149.8264	-.720435	29.74269
Firm Size	275	20.57000	32.00000	27.22567	2.706974
Valid N (listwise)	275				

The liquidity variable has a minimum value of 0.030000 and a maximum value of 492.4100, according to Table 3. The liquidity variable has a mean of 12.19025 and a standard deviation of 46.27427. The leverage variable then ranges from a minimum of -76.75000 to a high of 27.04000. The standard deviation is 5.215740, while the mean leverage is 0.655855. The profitability variable has a range of -0.125000 to 0.428000. The standard deviation is 0.060556, while the mean profitability is 0.024455. For financial distress, the smallest value is -441.5970 and the largest is 149.8264. The mean financial distress is -0.720435, while the standard deviation is 29.74269. Meanwhile, the smallest company size is 20.57000, and the largest is 32.00000. The average company size is 27.22567, while the standard deviation is 2.706974.

3.1.2 Normality Test

The purpose of the normality test is to ascertain whether the residuals, or disturbance variables, in a regression model have a normal distribution. Instead of needing each study variable to be normally distributed, the regression model actually looks at the residuals (Ghozali, 2021). The results of the Jarque-Bera test are presented in Table 4.

Table 4. Normality Test Result (Standardized Residuals)

Sample: 2021–2025 Observations 275	
Mean	-9,86e-22
Median	3,57e-09
Maximum	5,96e-05
Minimum	-5,90e-05
Std. Dev.	2,57e-05
Skewness	0,038893
Kurtosis	2,054855
Jarque-Bera	10,30505
Probability	0,005785

Based on Table 4, the Jarque–Bera probability value of 0.005785 is less than 0.05, so the residuals are not normally distributed. However, with 275 observations the sample is large, and according to the central limit theorem the distribution of the estimators approaches normality as the sample size increases, so the deviation from residual normality does not bias the regression coefficients (Ghozali, 2021). In addition, residual normality is not a requirement for the estimator to be BLUE (Best Linear Unbiased Estimator); therefore, the analysis proceeds to the subsequent assumption tests.

3.1.3 Multicollinearity Test

The multicollinearity test, according to Ghozali (2021), is used to ascertain whether independent variables in a regression model exhibit multicollinearity, that is, whether there is a strong connection between them. The Tolerance and Variance Inflation Factor (VIF) values can be examined to make this assessment. Multicollinearity is deemed nonexistent if the VIF value is less than 10 or the tolerance value is greater than 0.10, and it is deemed present if the VIF value is greater than 10 or the tolerance value is less than 0.10. The results are displayed in Table 5.

Table 5. Multicollinearity Test Result

Variable	Collinearity Statistics VIF
Current Ratio	1,001813
Debt to Equity Ratio	1,004010
Return on Assets	1,026567
Firm Size	1,026567

As shown in Table 5, because the VIF values for liquidity, leverage, profitability, and company size are all less than 10, the multicollinearity test findings indicate that there is no multicollinearity in the data.

3.1.4 Heteroskedasticity Test

The heteroscedasticity test seeks to ascertain whether the regression model shows unequal residual variances across observations, according to Ghozali (2021). The condition is referred to as homoscedasticity if the residual variance stays constant and heteroscedasticity if the variance varies. Heteroscedasticity should not be present in a good regression model. The results of the test using the absolute residual (ABS Resid) technique are presented in Table 6.

Table 6. Heteroskedasticity Test Result

	Unstandardized Coefficients			
	Coefficient	Std. Error	t	Prob.
(Constant)	1.88E-05	8.32E-06	2.2644500	0.0243
Current Ratio	1.32E-08	1.76E-08	0.7477890	0.4552
Debt to Equity Ratio	1.23E-07	1.57E-07	0.7853900	0.4329
Return On Assets	9.90E-06	1.36E-05	0.7255220	0.4688
Firm Size	9.28E-08	3.06E-07	0.3038160	0.7615

Table 6 shows that the probability values for liquidity, leverage, profitability, and company size were all more than 0.05; it may therefore be inferred that there was no indication of heteroscedasticity based on the results of the heteroscedasticity test using the ABS Resid technique.

3.1.5 Autocorrelation Test

In a regression model, autocorrelation testing is performed to ascertain whether residuals in a certain period and those in the previous period are correlated. Regression models without autocorrelation problems are considered good, according to Ghozali (2021). The Durbin–Watson statistic or other testing techniques suitable for the study model can be used to perform autocorrelation testing. The Durbin–Watson result is presented in Table 7.

Table 7. Autocorrelation Test Result

Model	R	R Square	Adjusted R Square	Durbin-Watson
1	1,000000	1,000000	1,000000	2,23288

Table 7 shows that the Durbin–Watson value is 2.232888, which is greater than 2.2100 for 4–dL, indicating negative autocorrelation in the research model.

3.1.6 T-Test (Partial Test)

The t-test is used to ascertain each independent variable’s partial impact on the dependent variable, according to Ghozali (2021). The significance level for the test is set at 5%. The independent variable has a significant partial impact on the dependent variable if the probability value is smaller than 0.05. On the other hand, a probability value higher than 0.05 suggests that the impact of the variable is not significant. The results are presented in Table 8.

Table 8. T-Test (Partial Test) Result

Variable	Coefficients	Std. Error	t-Statistic	Prob.
(Constant)	-4.299913	0.000367	-11703.17	0.0000
Current Ratio	-0.004000	7.02E-08	-56974.10	0.0000
Debt to Equity Ratio	5.700000	3.56E-07	16014333	0.0000
Return on Assets	-4.499994	3.95E-05	-113904.0	0.0000
Firm Size	-3.17E-06	1.35E-05	-0.235084	0.8144

Based on Table 8, the constant value determined by the (partial) t-test is -4.299913. This shows that the value of financial distress is equal to the constant value of -4.299913 when the independent variables and the moderating variable are taken to be constant.

Additionally, the estimated t-value is -56,974.10, the p-value is 0.0000, and the coefficient for the liquidity variable assessed using the CR is -0.004000. Liquidity has a significant impact on financial distress since the p-value is less than the 5% significance level ($0.0000 < 0.05$). The negative coefficient shows that a company's degree of financial hardship decreases with increasing liquidity; thus, H1 is accepted.

Leverage was calculated using the DER with a coefficient of 5.700000, a t-value of 16,014,333, and a probability of 0.0000. Because the probability value is $0.0000 < 0.05$, leverage has a substantial impact on financial distress. The positive coefficient shows that a company's degree of financial hardship rises in tandem with an increase in leverage; thus, H2 is accepted.

Next, the ROA-based profitability variable has a p-value of 0.0000, a computed t-value of -113,904.0, and a coefficient of -4.499994. Profitability has a significant impact on financial distress because the p-value is less than 0.05. The negative coefficient shows that the higher a company's profitability, the lower its level of financial distress; thus, H3 is accepted.

Meanwhile, firm size has a coefficient of -3.17E-06 with a probability of 0.8144 (> 0.05), indicating that firm size has no significant direct effect on financial distress. Together with the significant interaction terms reported in Table 9, this pattern suggests that firm size acts as a pure moderator.

3.1.7 Moderating Regression Analysis (MRA) Test

A type of multiple linear regression analysis that includes an interaction variable between the independent and moderating variables is called Moderated Regression Analysis (MRA), according to Ghazali (2021). The purpose of this analysis is to ascertain if the moderating variable makes the association between the independent and dependent variables stronger or weaker. This study uses MRA to investigate how business size modifies the impact of profitability, leverage, and liquidity on financial distress. The results are presented in Table 9.

Table 9. Moderated Regression Analysis (MRA) Result

Variable	Coefficients	Std. Error	t-Statistic	Prob.
Current Ratio*Firm Size	-0.000180	7.43E-05	-2.419395	0.0162
Debt to Equity Ratio* Firm Size	0.206526	0.000656	314.8813	0.0000
Return on Assets*Firm Size	-0.195426	0.056205	-3.477043	0.0006

As presented in Table 9, the interaction between liquidity and firm size (Current Ratio $\times$ Firm Size) produced a coefficient of -0.000180, a t-value of -2.419395, and a p-value of 0.0162. The test findings show that business size moderates the association between liquidity and financial hardship because the probability of 0.0162 is smaller than 0.05. Because the interaction coefficient has the same (negative) sign as the direct effect of liquidity, firm size strengthens the negative effect of liquidity on financial distress; thus, H4 is accepted.

Furthermore, a coefficient of 0.206526, a t-value of 314.8813, and a probability of 0.0000 are obtained from the interaction between the Debt-to-Equity Ratio and Firm Size. Firm size moderates the impact of leverage on financial distress because the probability of 0.0000 is less than 0.05. The positive interaction coefficient indicates that firm size strengthens the positive effect of leverage on financial distress; thus, H5 is accepted.

In contrast, the interaction between profitability and business size has a probability of 0.0006, a t-value of -3.477043, and a coefficient value of -0.195426. Firm size moderates the association between profitability and financial distress because the probability of 0.0006 is smaller than 0.05. The negative interaction coefficient indicates that firm size strengthens the negative effect of profitability on financial distress; thus, H6 is accepted.

Overall, the results of this study show that company size moderates the relationship between liquidity, profitability, and the debt-to-equity ratio and the degree of financial hardship experienced by businesses in the property and real estate sector throughout the study period, and in all three cases it strengthens the relationship.

3.2 Discussion

3.2.1 The Effect of Liquidity on Financial Distress

The results show that companies with stronger liquidity are better able to meet their short-term obligations and maintain financial stability. Adequate current assets are especially important in the property and real estate sector because

companies need sufficient funds to support operational activities and meet short-term liabilities. Therefore, maintaining an adequate level of liquidity can reduce the potential for financial difficulties. This finding is consistent with the findings of Khoiriyah & Amaliyah (2024), Akashi (2025), and Saraswati et al. (2024), who found that liquidity is a significant determinant of financial distress. However, it differs from Khansa et al. (2022), who found no effect, and Ayem & Sogen. (2024), who found a positive effect, suggesting that the role of liquidity depends on sector characteristics.

3.2.2 The Effect of Leverage on Financial Distress

The results indicate that financial distress is positively impacted by leverage. According to this research, a company's reliance on debt raises its financial load and, as a result, its chance of financial issues. Companies with high leverage may have to devote a larger percentage of their resources to paying debt and interest, which would limit their financial flexibility. This outcome is in line with the findings of Khoiriyah & Amaliyah (2024), Adityaningrum et al. (2024), and Khansa et al. (2022), who discovered a positive connection between financial distress and leverage, but contrasts with Ayatika, Suryaningprang, Herlinawati, Sudaryo, & Supiyadi (2024), who reported a negative effect. In order to avoid undue financial strain, businesses must properly manage their debt structure.

3.2.3 The Effect of Profitability on Financial Distress

The results show that financial distress is negatively impacted by profitability. Stronger internal financial resources and a greater ability to fulfil responsibilities are typically found in companies that are able to produce larger returns from their assets. Thus, increased profitability can improve financial performance and lower the probability of financial problems. The results of Khansa et al. (2022) and Chrissentia & Handoko (2025), which demonstrated that profitability lessens financial distress, are in line with this conclusion. However, other research has also produced conflicting results Adityaningrum et al., 2024; Aulia & Fauzan (2025); Wulandari & Jaeni (2021), suggesting that the impact of profitability may vary depending on the features of the businesses and sectors under investigation. The current research highlights how crucial it is to preserve sustainable profitability in order to prevent financial distress.

3.2.4 The Moderating Role of Firm Size in the Relationship Between Liquidity and Financial Distress

The results demonstrate that the association between liquidity and financial distress is moderated by firm size. Because the interaction coefficient is negative, the liquidity-reducing effect on distress becomes stronger as firm size increases. Bigger businesses typically have more assets and easier access to finance, which allows them to convert and manage current assets more effectively. This outcome is in line with the findings of Khoiriyah & Amaliyah (2024), who similarly found that firm size moderated the association between financial distress and financial characteristics. It differs, however, from Rahmadiani & Asyik (2021) and Ayem & Sogen (2024), who found that firm size weakens the effect of liquidity. Therefore, business size offers a crucial background for comprehending how liquidity affects financial hardship.

3.2.5 The Moderating Role of Firm Size in the Relationship Between Leverage and Financial Distress

The connection between leverage and financial distress is also found to be moderated by firm size. The positive interaction coefficient indicates that the adverse effect of debt on distress is stronger in larger property companies, which typically finance land banks and large projects with substantial borrowing. Larger businesses may have more flexibility in managing their capital structure because they often have more assets and operating capability. However, the financial distress connected with excessive debt is not eliminated by operating on a greater scale. The finding confirms that firm size moderates this relationship, as reported by Khoiriyah & Amaliyah (2024) and Andaris & Dasman (2024), but its direction differs from Ayem & Sogen (2024) and Rahmadiani & Asyik (2021), who found that firm size weakens the effect of leverage. Therefore, regardless of the size of the organization, debt management is still crucial.

3.2.6 The Moderating Role of Firm Size in the Relationship Between Profitability and Financial Distress

The results also show that the association between profitability and financial distress is moderated by firm size. This result implies that the capacity of profitability to alleviate financial distress differs depending on the size of the business. Bigger businesses might have more operational resources and be able to make better use of their assets, which could affect how profitability and financial health are related. This finding differs from Rahmadiani & Asyik (2021), Andaris & Dasman. (2024), and Ayem & Sogen (2024), who found no moderating effect of firm size on the profitability–distress relationship, and therefore represents a contribution of this study to the literature. Therefore, while evaluating the risk of financial hardship, profitability should not be taken into account separately from business characteristics.

4. CONCLUSION

This study concludes that, among property and real estate companies listed on the Indonesia Stock Exchange during 2021–2025, liquidity measured by the current ratio has a significant negative effect on financial distress, leverage measured by the debt-to-equity ratio has a significant positive effect, and profitability measured by return on assets has a significant negative effect, while firm size significantly moderates and strengthens all three relationships without having a significant direct effect, so that all six hypotheses are accepted. The main benefit of these findings is that they provide an early-warning reference: managers of property companies should maintain adequate current assets, control debt-financed

expansion, and sustain asset productivity, particularly in large firms in which these effects are amplified, while investors and creditors can use CR, DER, and ROA together with firm size to screen distress risk. This study has several limitations, namely that it covers only one sector and 55 companies over five years, uses only three financial ratios and one distress model (Zmijewski) whose components overlap with the independent variables, and does not consider macroeconomic or governance factors. Future researchers are therefore recommended to use alternative distress measures such as the Altman Z-score, Springate, or Grover models, to add non-financial and macroeconomic variables such as corporate governance, sales growth, interest rates, and inflation, to extend the observation period, and to compare several sectors in order to improve the generalizability of the results.

5. DECLARATION

5.1 Author Contributions

Conceptualization: E.S. and H.;

Methodology: E.S. and H.;

Software: E.S.;

Validation: E.S. and H.;

Formal Analysis: E.S.;

Investigation: E.S.;

Resources: E.S.;

Data Curation: E.S.;

Writing Original Draft Preparation: E.S.;

Writing Review and Editing: E.S.;

Visualization: E.S.;

All authors have read and agreed to the published version of the manuscript.

5.2 Data Availability

The data used in this study were obtained from the annual financial statements of property and real estate companies listed on the Indonesia Stock Exchange (IDX). The data are publicly available through the official IDX website. The processed dataset used in this study is available from the corresponding author upon reasonable request.

5.3 Funding

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5.4 Institutional Review Board Statement

Not applicable. This study used secondary data obtained from publicly available company financial statements and did not involve human participants or animals.

5.5 Informed Consent Statement

Not applicable. This study did not involve human participants.

5.6 Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

5.7 Generative AI and AI-Assisted Technologies in the Writing Process

Generative AI tools were used to assist with improving the clarity and language of the manuscript. The authors reviewed and edited the AI-assisted content and take full responsibility for the final content of the manuscript.

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