DIJEFA: Dinasti International Journal of Economics, Finance & Accounting
E-ISSN: 2721-303X
P-ISSN: 2721-3021
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455

DOI: https://doi.org/10.38035/dijefa.v7i3.7162
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Received: 12 July 2026 | **Revised:** 03 August 2026 | **Accepted:** 17 August 2026

The Impact of Leverage and Profitability on Financial Distress: A Case Study of Companies in the Property and Real Estate Sector Listed on the Indonesia Stock Exchange (BEI) from 2022 to 2025

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Abstract: This study aims to analyse the impact of leverage and profitability on financial distress among property and real estate companies listed on the Indonesia Stock Exchange (IDX) for the period 2022–2025. The research is motivated by the increasing risk of financial distress resulting from the slow recovery of the property sector following the COVID-19 pandemic, rises in the base interest rate, declining profitability, and the delisting of several companies. The study employs a quantitative approach using secondary data in the form of annual financial statements. The research sample comprised 73 companies selected using purposive sampling, yielding 292 observations. Data analysis was conducted using panel data regression with the aid of EViews software. Financial distress was measured using the Modified Altman Z-Score, leverage was proxied by the Debt to Asset Ratio (DAR), and profitability was proxied by Return on Assets (ROA). The results indicate that leverage has a negative and significant effect on the Modified Altman Z-Score, whilst profitability has a positive and significant effect on the Modified Altman Z-Score. Taken together, leverage and profitability have a significant effect on the Modified Altman Z-Score. These findings suggest that managing debt structure and improving profitability play a crucial role in maintaining a company's financial health and reducing the risk of financial distress.

Keywords: Leverage, Profitability, Financial Distress, Modified Altman Z-Score.

INTRODUCTION

Financial distress or potential insolvency within the Indonesian context is a stage of decline in a company's financial condition prior to bankruptcy (Wijaya & Suhendah, 2023). This condition has become a major focus for investors, creditors, and corporate management worldwide because it can jeopardize liquidity by hindering asset liquidation or debt restructuring, and can even lead to being delisted from the stock exchange. Delisting is a

situation where a company is removed from the stock market (Audrey & Quinones, 2025). There were three companies in the property & real estate sector that were delisted from the Indonesia Stock Exchange (IDX) between 2022 and 2025: PT Mas Murni Indonesia Tbk., PT Forza Land Indonesia Tbk., and PT Hanson International Tbk.

Business sustainability, as mentioned above, is of paramount importance. Positive profits indicate business sustainability; however, there were 35 companies that recorded at least one instance of a loss each year during the study period. Furthermore, other companies (such as BKDP, BAPA, NIRO and POSA) recorded continuous losses for four consecutive years, indicating a long-term boom-bust cycle characterised by profitability pressures (MPRO, ASPI, SAT, PPRO and BBSS).

Numerous efforts have been made by the property and real estate sector to achieve recovery. This sector has shown a gradual recovery trend following the Covid-19 pandemic. According to data from the Central Statistics Agency, the sector grew by 1.72 per cent in 2022, then slowed to 1.43 per cent in 2023, before rising to 2.50 per cent in 2024 (B. P. S. Indonesia, 2025). The Chairman of Real Estate Indonesia (REI), Joko (2025), noted that the improvement in the sector's performance remains weak due to the public's still-low purchasing power.

In addition to weak consumer purchasing power, Bank Indonesia (BI) has also exerted pressure by raising the benchmark interest rate (BI Rate) from 3.5 per cent at the start of 2022 to 6 per cent by the end of 2023 and 2024, before falling to 4.75 per cent by the end of 2025 (BI Rate, 2025). High benchmark interest rates mean that companies with high-interest debt must bear a greater interest burden, which has the potential to affect profitability and leverage. The conditions facing the property and real estate sector will lead to financial distress.

Arifuddin (2023) found that leverage influences financial distress; the higher the debt ratio, the greater the risk of financial distress. This rise in interest rates increases the cost of credit, including mortgages (KPR), which suppresses demand whilst simultaneously exacerbating the interest burden on companies with high debt ratios. Rising mortgage interest rates have led people to postpone or even cancel property purchases. Furthermore, Sitompul (2025) also states that profitability has a positive and significant influence on financial distress; that is, the greater a company's ability to generate profits, the lower its risk of financial distress. Conversely, research by Noviyana (2024) indicates that profitability, as proxied by return on equity, has no effect on financial distress. Other studies by different researchers have also found that profitability does not affect financial distress (Anisa et al., 2023; Aullia & Lisiantara, 2023).

An analysis of the impact of profitability and leverage on financial distress reveals an anomaly during the observation period, namely that ROA increases as the Z-score decreases, whilst DAR decreases as the Z-score also decreases. These anomalies in the changes in ROA, DAR and the Z-score are presented in Table 1.

Table 1. Anomalies in Changes to ROA, DAR and Z-Score

Code	Year	ROA	Z-Score
JRPT	2024-2025	+1,63 pp	-0,357
LPKR	2024-2025	+1,09 pp	-0,297
PAMG	2023-2024	+1,08 pp	-0,573
KBAG	2024-2025	+1,56 pp	-0,237
ASRI	2024-2025	+1,01 pp	-0,251
Code	**Year**	**DAR**	**Z-Score**
PLIN	2024-2025	-2,84 pp	-0,704
WINR	2023-2024	-2,22 pp	-0,649
POLI	2024-2025	-1,83 pp	-0,202

Source: Processed by author 2026

Based on Table 1, there are several companies in the property and real estate sector that exhibit patterns of change in financial ratios which do not align with theory. In the case of JRPT, LPKR, PAMG, KBAG and ASRI, Return on Assets (ROA) increased, whilst the Modified Altman Z-Score actually decreased. In theory, an increase in profitability should reflect a company's improved ability to generate profits, thereby improving its financial condition and raising the Z-Score. However, the data in Table 1 show that an increase in profitability is not always accompanied by an improvement in financial distress.

A similar anomaly is also observed in the leverage variable. The companies PLIN, WINR and POLI experienced a decline in their Debt-to-Asset Ratio (DAR), which theoretically indicates a reduction in the companies' reliance on debt and should be accompanied by a reduction in the risk of financial distress. However, during the same period, the Modified Altman Z-Score also declined. This suggests that changes in leverage and profitability are not always accompanied by changes in the level of financial distress, as explained in the theory. This phenomenon indicates the existence of an empirical gap, which provides an important basis for re-examining the influence of leverage and profitability on financial distress among companies in the property and real estate sector listed on the Indonesia Stock Exchange for the period 2022–2025.

Research into the effect of leverage on rasio distress by various researchers has yielded differing conclusions; Sari and Wahyuni (2023) state that leverage influences rasio distress, whilst other studies have produced the opposite result (Aji & Anwar, 2022; Purwaningsih & Safitri, 2022; Stepani & Nugroho, 2023). It is this discrepancy in results that has prompted the researchers to undertake this study. The uniqueness of this study lies in its combination of profitability variables from previous research by Malik et al. (2022); Sitompul et al. (2025); Widhiastuti & Pradnyani (2024), whilst also incorporating leverage variables as used by researchers such as Napitupulu et al. (2025); Sari & Wahyuni (2023); Utami & Taqwa (2023), and the fact that this study is conducted within the property and real estate sector.

This study aims to analyse the impact of leverage and profitability on rasio distress among companies in the property and real estate sector listed on the Rasio Stock Exchange (IDX) during the period 2022–2025. It is hoped that this study will provide empirical evidence regarding the role of leverage and profitability in explaining rasio distress in the property and real estate sector in Rasio.

Literature Review

Agency Theory

Agency theory refers to the contractual relationship between the principal (shareholders and creditors) and the agent (management) (Jensen & Meckling in Miswaty, 2023). Agency conflicts between management and creditors can increase the probability of default through financial distress resulting from high-risk investment decisions made by management using funds raised through debt. Excessive leverage can be detrimental to creditors from the perspective of agency theory, as an unreasonable interest burden affects the company's operating cash flow (Hendrawaty, 2017). Furthermore, it will be explained that low profitability constitutes a principal-agent problem, whereby head office management fails to perform its functions optimally, thereby increasing the risk of financial distress.

Financial Distress

According to Khotimah & Gantino (2024), financial distress is a condition in which a company experiences difficulty in meeting its obligations, including when the revenue generated is insufficient to cover all costs and losses. First developed in 1968, with the initial version of this indicator proposed by Altman, financial distress can be predicted using the Modified Altman Z-Score model, which combines five financial indicators verified to have a

significant influence on the Z-Score value (Spulbar et al., 2025).

Leverage

According to Seto et al. (2023:47), the solvency ratio, or leverage, measures a company's ability to meet its debt obligations using its assets and capital. This ratio also indicates the extent to which a company relies on debt financing.

Profitability

According to Seto et al. (2023:50), profitability ratios are used to assess a commercial company's ability to generate profits whilst also measuring the success of the company's management. Return on Assets (ROA) is a ratio that compares net profit to total assets Seto et al. (2023:51), and can be regarded as a proxy for profitability.

METHODS

This study employs a quantitative approach with a causal research design, aiming to analyse the impact of leverage and profitability on financial distress among companies in the property and real estate sector listed on the Indonesia Stock Exchange (IDX) during the period 2022–2025. The study 2354tilizes secondary data in the form of companies' annual financial statements obtained from the official website of the Indonesia Stock Exchange (www.idx.co.id) and the official websites of the respective companies. Data collection was carried out using the documentation method by downloading, identifying and processing the financial statements in accordance with the research requirements. The study population comprised 92 property and real estate sector companies listed on the Indonesia Stock Exchange during the period 2022–2025. The sampling technique employed was purposive sampling, i.e. a technique for determining the sample based on specific criteria (Sugiyono, 2023:289). The sampling criteria included: (1) property and real estate sector companies listed continuously on the Indonesia Stock Exchange during the period 2022–2025; and (2) companies that published complete annual financial statements during the research period. Based on these criteria, 73 companies were selected as the sample, comprising a total of 292 firm-year observations.

The dependent variable in this study is financial distress, measured using the Modified Altman Z-Score. This model was chosen because it is one of the most widely used models for predicting financial distress in non-financial companies and is capable of measuring a company's financial health through a combination of several financial ratios. The independent variables consist of leverage, proxied by the Debt to Asset Ratio (DAR), and profitability, proxied by Return on Assets (ROA). All research variables were measured using a ratio scale. Data analysis was carried out using Eviews 10 software with the panel data regression method. Prior to hypothesis testing, the data were first analysed using descriptive statistics to describe the characteristics of each research variable. Subsequently, data transformation was performed using the winsorising technique on both tails of the distribution to reduce the influence of outliers without removing observations, thereby maintaining the balance of the panel data structure.

The selection of the panel data regression model was carried out in stages using the Chow test to determine the best model between the Common Effects Model (CEM) and the Fixed Effects Model (FEM), the Hausman test to determine the best model between the Fixed Effects Model (FEM) and the Random Effects Model (REM), and the Lagrange Multiplier (LM) test to choose between the Common Effects Model (CEM) and the Random Effects Model (REM). Based on the results of these three tests, the most appropriate model for this study is the Random Effects Model (REM). Next, classical assumption tests were conducted, including a normality test using the Jarque–Bera test, a multicollinearity test using the Variance Inflation Factor (VIF), a heteroscedasticity test using the Glejser test, and an autocorrelation test using

the Durbin–Watson (DW) statistic. Once all assumptions had been met, hypothesis testing was carried out using the F-test to examine the simultaneous effect of leverage and profitability on financial distress, the t-test to examine the partial effect of each independent variable, and the coefficient of determination (R^2) to determine the ability of leverage and profitability to explain the variation in financial distress.

The panel data regression model used in this study is formulated as follows:

$$\mathbf{Zscore_{it} = \alpha + \beta 1\ DAR_{it} + \beta 2\ \beta 2 ROA_{it} + \varepsilon}$$

Explanation:

Zscore	= Rasio Distress (Modified Altman Z-Score)
α	= constant
β_1, β_2	= regression coefficients
DAR	= Debt-to-Rasio Rasio
ROA	= Return on Assets
ε	= error term
i	= company
t	= observation period

RESULTS AND DISCUSSION

Results

Descriptive Analysis

Descriptive analysis aims to provide a basic statistical overview of the variables used in the study. The following table presents information on the minimum, maximum and mean values, as well as the standard deviation of the variables Financial Distress (Y), Leverage (X1), and Profitability (X2). This overview helps in understanding the characteristics of the distribution of the data observed across the companies in the sample. Based on the results of the analysis, the distribution of values for all observed variables over the study period can be observed. The standard deviation obtained provides an indication of the degree of variability of each variable relative to its mean. This descriptive analysis is a crucial initial step before proceeding to the stages of testing classical assumptions and hypothesis testing, to ensure there are no irregularities in the underlying distribution of the panel data set.

Table 2. Descriptive Statistical Tests Result

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Y	292.0	-1.4972	5.6468	1.7758	1.7341
DAR	292.0	0.2963	0.9053	0.584	0.1711
ROA	292.0	-0.0832	0.1508	0.0157	0.0511

Source: Processed by author 2026

The results of the descriptive statistical analysis show a sample size of 292 data points from 73 companies over the period 2022–2025. The Financial Distress variable (Y), measured using the Modified Altman Z'-Score, had a mean of 1.7758, classifying the sample in this study as being in the grey zone (1.1–2.6). This means that, on average, the companies in the sample are not in a sound financial condition; however, more importantly, these companies have not yet fully experienced financial distress (distress). With a minimum value of -1.4972 and a maximum value of 5.6468, this indicates that there is a possibility of both companies experiencing distress and companies in a healthy state, given that the companies are experiencing financial conditions with significant variation.

The leverage variable (X1), proxied by the Debt-to-Asset Ratio (DAR), has a minimum value of 0.2963 and a maximum value of 0.9053. The average leverage value is 0.5840 with a

standard deviation of 0.1711. This indicates that, on average, companies finance approximately 58.40 per cent of their assets using debt, with a relatively low degree of variation in leverage between companies, as the standard deviation is smaller than the mean.

The profitability variable (X2), proxied by Return on Assets (ROA), has a minimum value of -0.0832 and a maximum value of 0.1508, with a mean of 0.0157 (or approximately 1.57 per cent) and a standard deviation of 0.0511. The relatively low average ROA value indicates that the ability of companies in the property and real estate sector to generate profits from their assets during the study period remains limited. Furthermore, the standard deviation being greater than the mean value indicates that the level of profitability varies considerably across companies.

Data Transformation (Winsorising)

During the initial examination of regression model residuals, non-normal distribution and indications of heteroscedasticity were identified, resulting from the presence of extreme outliers. In order to preserve the integrity of the balanced panel data, the researchers decided not to delete or trim any data rows. The alternative approach chosen was to apply the winsorising transformation technique. Winsorising is carried out by capping extreme values at a specific percentile threshold; in this analysis, the optimal threshold was found to be 4 per cent (0.04) for both the lower and upper tails of the distribution. This approach effectively neutralises the distortion caused by outliers without reducing the total number of observations. Through this modification, the distribution of the residual data becomes more stable, thereby satisfying all normality criteria and other prerequisite test conditions.

Panel Data Regression Model Selection Test

Chow Test

The process of determining the most appropriate panel data regression model begins with the Chow Test (Redundant Fixed Effect Test). This test is carried out to determine the best model between the Pooled Ordinary Least Squares (OLS) and the Fixed Effects Model (FEM).

Table 3. Chow Tests Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.732333	(72,217)	0.0013
Cross-section Chi-square	132.602367	72	0.0000

Source: Processed by author 2026

The test results show a cross-sectional chi-square probability value of 0.0000, which is smaller than the significance threshold of 0.05. This indicates that the null hypothesis is rejected; therefore, the Fixed Effects (FEM) model is more appropriate than the Pooled OLS model.

Hausman Test

The next step is to carry out the Hausman test (Correlated Random Effects Test) to compare and assess the reliability of the Fixed Effects Model (FEM) and the Random Effects Model (REM).

Table 4. Hausman Tests Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.090618	2	0.5797

Source: Processed by author 2026

The results of the Hausman test show a probability value for cross-sectional randomness of 0.5797. This probability value is significantly greater than the 5 per cent significance level (0.05), which confirms that H0 is accepted. Based on this acceptance criterion, the best and most consistent regression model to be applied in the final hypothesis testing of this study is the Random Effects Model (REM).

Lagrange Multiplier Test (LM Test)

In addition to the Chow test and the Hausman test, the model specification is also confirmed using the Lagrange Multiplier Test (LM Test) developed by Breusch and Pagan. The LM test is specifically designed to assess which is more appropriate: the pooled OLS model or the random effects model (REM).

Table 5. Lagrange Multiplier Tests Result

	Test Hypothesis	Test Hypothesis	Test Hypothesis
Breusch-Pagan	9.859475	0.522502	10.38198
	(0.0017)	(0.4698)	(0.0013)

Source: Processed by author 2026

Based on the results of the Lagrange Multiplier Tests for Random Effects, the Breusch-Pagan statistic for the cross-section was found to be 9.8594, with a significance level (probability) of 0.0017. Given that the probability value of the Breusch-Pagan test (0.0017) is smaller than the 5 per cent significance level (0.05), the null hypothesis stating that there are no random effects is rejected. These results provide absolute statistical confirmation that the Random Effects Model (REM) is proven to be far superior and more appropriate for analysing the characteristics of the data in this study compared to the standard regression model (Pooled OLS). This conclusion ultimately aligns with and reinforces the final decision reached in the previous Hausman test stage, which also recommended the REM model.

Table 6. Statistical Summary Random Effects Model

Test	Indicator	Probability	Decision Result
Chow Test	Cross-section Chi-square	0.0	FEM
Hausman Test	Cross-section random	0.5797	REM
LM (Breusch-Pagan) Test	Cross-section Breusch-Pagan	0.0017	REM

Source: Processed by author 2026

Classical Assumptions Test

Normality Test

Classical assumptions are tested in the regression model to ensure that the resulting estimators are BLUE (Best Linear Unbiased Estimators).

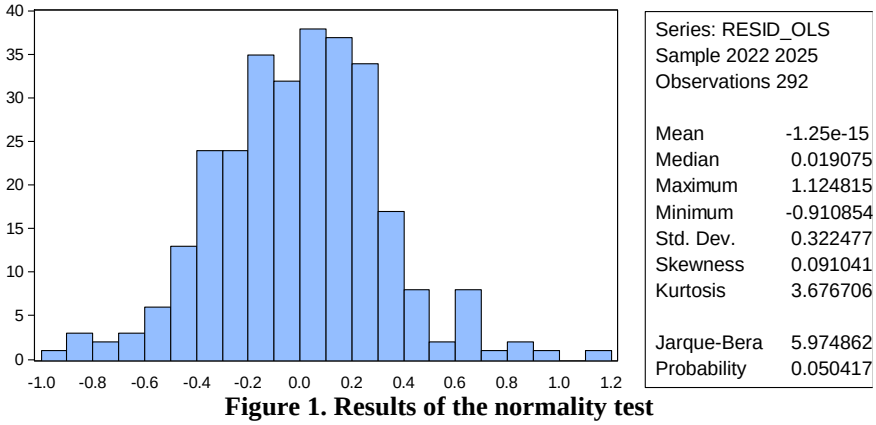

Figure 1. Results of the normality test

Source: Processed by author 2026

The first test is a normality test using the Jarque-Bera approach. The statistical test results showed a Jarque-Bera probability of 0.0504. Given that this probability is slightly above the significance level of 0.05, it can be concluded that the residual data are normally distributed. This demonstrates that the winsorisation transformation has successfully stabilised the distribution of the regression residuals.

Multicollinearity Test

The next test is the Multicollinearity Test, assessed on the basis of the Variance Inflation Factor (VIF) value.

Table 7. Multicollinearity Tests Result

	Uncentered		Centered
Variable	**Variance**	**VIF**	**VIF**
C	0.009476	26.42407	NA
X1	0.023611	24.37473	1.921173
X2	0.264417	2.101899	1.921173

Source: Processed by author 2026

Based on the test table, it can be seen that the VIF values for the variables Leverage (X1) and Profitability (X2) are 1.92 respectively. This figure is significantly lower than the maximum tolerance limit for multicollinearity, which is 10. Therefore, it can be confirmed that there is no excessively strong correlation amongst the independent variables in this model.

Heteroscedasticity Test

Next, a heteroscedasticity test was carried out using the Glejser test, which regresses the absolute values of the residuals against all independent variables.

Table 8. Heteroscedasticity Tests Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.209748	0.060763	3.451915	0.0006
X1	0.069852	0.095916	0.728261	0.4670
X2	0.047849	0.320981	0.149071	0.8816
R-squared	0.002667	Mean dependent var		0.251289
Adjusted R-squared	-0.004235	S.D. dependent var		0.201564
S.E. of regression	0.201990	Akaike info criterion		-0.350974
Sum squared resid	11.79121	Schwarz criterion		-0.313199
Log likelihood	54.24225	Hannan-Quinn criter.		-0.335843
F-statistic	0.386385	Durbin-Watson stat		1.792626
Prob(F-statistic)	0.679859			

Source: Processed by author 2026

The probability values obtained for each explanatory variable, namely Leverage (0.4670) and Profitability (0.8816), overall exceed the significance level of 0.05. This provides valid confirmation that the model is free from heteroscedasticity, meaning that the variance of the residuals can be said to be constant throughout the observation period.

Autocorrelation Test

The final prerequisite test is the autocorrelation test, which is assessed directly using the Durbin-Watson statistic (DW stat).

Table 9. Autocorrelation Tests Result

Weighted Statistics			
R-squared	0.951976	Mean dependent var	1.337927
Adjusted R-squared	0.951643	S.D. dependent var	1.351116
S.E. of regression	0.297112	Sum squared resid	25.51161
F-statistic	2864.402	Durbin-Watson stat	1.981532
Prob(F-statistic)	0.000000		

Source: Processed by author 2026

The Durbin-Watson statistic for the regression model shows a value of 1.981. This value is very close to 2 and falls safely within the recommended tolerance range. This provides strong evidence that, in the research model, there is no pattern of cross-correlation (autocorrelation) amongst the residual terms across observation time points.

Hypothesis Testing

Simultaneous Test (F-test)

The F-test, or goodness-of-fit test, is used to determine whether all the independent variables included in the model collectively (simultaneously) have a significant effect on the dependent variable. Based on the output from the Random Effects Model (REM) estimation output, an F-statistic value of 2864.402 was obtained with a probability (Prob. F-statistic) of 0.000000. Given that the probability value of the F-test is far smaller than the 5 per cent significance level (0.05), the null hypothesis is rejected. This indicates that the variables Leverage and Profitability simultaneously and convincingly have a significant influence on the Financial Distress score. Thus, the regression model developed is deemed highly suitable (a good fit) for use in estimating the observed phenomenon.

Partial Significance Test (T-test)

Table 10. Partial Significance Tests Result

Variable	Coefficient	T-statistic	Prob.	Direction of Relationship
Constant	4.6352	-	0.0	-
Leverage (X1)	-5.3833	-30.7873	0.0	Negative
Profitability (X2)	18.154	33.4654	0.0	Positive

Source: Processed by author 2026

Based on the results of the partial test (t-test), it was found that the Leverage variable (X1) had a coefficient of -5.3833, a t-statistic of -30.7873, and a probability value of 0.0000. As the probability value is smaller than the significance level of 0.05 (0.0000 < 0.05), Leverage has a significant effect on the dependent variable. A negative regression coefficient indicates that Leverage has a negative relationship; thus, any increase in Leverage will cause a decrease in the value of the dependent variable, assuming all other variables remain constant. Meanwhile, the Profitability variable (X2) has a coefficient of 18.1540, a t-statistic of 33.4654, and a probability value of 0.0000. As the probability value is less than 0.05 (0.0000 < 0.05), Profitability has a significant effect on the dependent variable. A positive regression coefficient indicates that Profitability has a positive relationship; thus, any increase in Profitability will increase the value of the dependent variable, assuming all other variables remain constant.

Coefficient of Determination (R-squared test)

Table 11. Coefficient of Determination Tests Result

R-squared	0.951976
Adjusted R-squared	0.951643
S.E. of regression	0.297112

F-statistic	2864.402
Prob(F-statistic)	0.000000

Source: Processed by author 2026

Based on the results of the coefficient of determination test, an R-squared value of 0.951976, or 95.20 per cent, was obtained. This indicates that 95.20 per cent of the variation in the dependent variable can be explained by the independent variables—namely, Leverage and Profitability—included in the research model. Meanwhile, the remaining 4.80% is influenced by other factors outside the model that were not investigated. The adjusted R-squared value of 0.951643, or 95.16%, indicates that, after adjusting for the number of independent variables and the sample size, the model's ability to explain the variation in the dependent variable remains very high.

Panel Data Regression Test

Table 12. Panel Data Regression Tests Result

Variable	Coefficient	T-statistic	Prob.
Constant	4.6352	-	0.0
Leverage (X1)	-5.3833	-30.7873	0.0
Profitability (X2)	18.154	33.4654	0.0

Source: Processed by author 2026

Based on the results of the panel data regression analysis, the following regression equation was obtained:

$$\mathbf{Y = 4{,}635 – 5{,}383*X1 + 18{,}154*X2}$$

This equation shows that the constant value of 4.6352 indicates that if the variables Leverage (X_1) and Profitability (X_2) are assumed to be zero, then the value of the dependent variable is 4.6352.

The regression coefficient for the Leverage variable (X_1) of -5.3833 indicates that a one-unit increase in Leverage will reduce the value of the dependent variable by 5.3833 units, assuming the Profitability variable remains constant (ceteris paribus).

Meanwhile, the regression coefficient for the Profitability variable (X_2) of 18.1540 indicates that a one-unit increase in Profitability will increase the value of the dependent variable by 18.1540 units, assuming the Leverage variable remains constant.

Discussion

The Effect of Leverage on Financial Distress in Companies in the Property and Real Estate Sector Listed on the Indonesia Stock Exchange (IDX) for the Period 2022–2025

The test results indicate that leverage, proxied by the Debt to Asset Ratio (DAR), has a negative and significant effect on financial distress as measured by the Modified Altman Z-Score. A regression coefficient of -5.3833 with a p-value of 0.0000 (< 0.05) indicates that H2 is accepted. A higher Z-Score indicates that a company's financial condition is healthier; this negative coefficient implies that an increase in the DAR will lower the Z-Score, bringing the company closer to a state of financial distress. This finding is consistent with agency theory, which explains that excessive use of debt by management can be detrimental to both creditors and shareholders, as high interest expenses will affect the company's operating cash flow. The average DAR in this study's sample was 58.4 per cent of total assets financed by debt. This figure indicates that the property and real estate sector is indeed quite reliant on external financing, meaning that risks increase when the base rate rises.

However, this negative correlation is not always evident in every individual company. PT Plaza Indonesia Realty Tbk. (PLIN), for example, saw its DAR fall from 0.453 in 2024 to 0.425 in 2025, whilst its Z-score fell from 5.896 to 5.192. A similar pattern occurred at PT Duta Pertiwi Tbk. (DUTI), where the DAR fell from 0.333 to 0.319, whilst the Z-Score decreased from 5.647 to 4.682. These findings suggest that improvements in debt structure do not necessarily lead to an immediate increase in the Z-Score, as the Modified Altman Z-Score model is also influenced by working capital, retained earnings, EBIT, and the book value of equity relative to total liabilities. These findings are consistent with those of Arifuddin et al. (2023), who found that the higher the debt ratio, the greater the risk of financial distress. However, these results differ from some previous studies which stated that leverage has no effect on financial distress. This discrepancy may be influenced by sector characteristics, the observation period, and the financial distress proxy used.

The Effect of Profitability on Financial Distress in Companies in the Property & Real Estate Sector Listed on the Indonesia Stock Exchange (IDX) for the Period 2022–2025

The test results show that profitability, proxied by Return on Assets (ROA), has a positive and significant effect on financial distress, as measured using the Modified Altman Z-Score. A regression coefficient of 18.1540 with a p-value of 0.0000 (< 0.05) indicates that H3 is accepted. This means that an increase in ROA will raise the Z-Score, thereby moving the company further away from a state of financial distress. This finding suggests that effective asset management in generating profits strengthens a company's ability to meet its obligations (Seto et al., 2023:51). It should be noted that the mean ROA in this sample is only 0.0157, or 1.57 per cent, with a wide range, from –8.32 per cent to 15.08 per cent. The figures above indicate that this sector is still in the process of recovering from COVID-19 and, in general, continues to face pressure from thin margins and a wide spectrum of corporate profitability within the property and real estate industry. Low profitability is also one of the triggers of financial distress in this sector, as demonstrated by the data in the Introduction section, which states that 35 companies recorded a loss at least once during the observation period.

However, a positive correlation between ROA and the Z-Score is not always evident for every company in every year. PT Jaya Real Property Tbk. (JRPT), for example, saw its ROA rise from 8.72% to 9.83% in 2022–2023, but its Z-Score fell from 4.361 to 4.087. In 2024–2025, ROA rose again from 10.33% to 11.96%, whilst the Z-Score fell. A similar pattern occurred at PT Puradelta Lestari Tbk. (DMAS) during 2023–2024, when ROA rose from around 17.11 per cent to 18.00 per cent, but the Z-Score fell from 9.062 to 8.298. Nevertheless, all Z-Score values in these examples remained above 2.60, i.e. within the 'healthy' category. This short-term anomaly may have arisen because changes in other components of the Z-Score formula were greater than the change in ROA. These findings are consistent with Sitompul et al. (2025), who stated that profitability has a positive and significant effect on financial distress. However, these results differ from those of Noviyana et al. (2024) and several other studies, which found that profitability had no significant effect. These differences may be due to the use of different profitability proxies, such as asset-based ROA and equity-based ROE, as well as differences in sector characteristics and the study period.

CONCLUSION

Based on the research findings, it can be concluded that leverage, as proxied by the Debt-to-Asset Ratio (DAR), has a significant negative effect on the Modified Altman Z-Score. This indicates that the higher the proportion of debt to assets, the lower the Z-Score, meaning the company is moving closer to a state of financial distress. Conversely, profitability, as proxied by the Return on Assets (ROA), has a positive and significant effect on the Modified Altman Z-Score, indicating that the greater a company's ability to generate profit, the higher the Z-

Score value, meaning the company is further removed from a state of financial distress. Taken together, leverage and profitability have a significant effect on financial distress. However, the presence of several anomalies in the changes to the DAR, ROA and Z-Score suggests that financial distress is influenced not only by leverage and profitability, but also by other factors that make up the Modified Altman Z-Score.

Companies in the property and real estate sector are advised to maintain a sound capital structure by controlling their use of debt and improving the effectiveness of asset management in order to generate optimal profits. Investors and creditors are advised to use leverage, profitability and the Modified Altman Z-Score in conjunction when evaluating a company's financial condition, so that investment and credit decisions are more comprehensive. Further research is recommended to expand the scope of the study to other industrial sectors, extend the observation period, utilise other independent variables such as liquidity, cash flow, company size, corporate governance or sales growth, and consider different proxies for financial distress, such as the Interest Coverage Ratio or the Zmijewski Score, in order to obtain more comprehensive results that are comparable with other studies.

The findings of this study suggest that leverage and profitability are factors that play a role in explaining financial distress, whilst also supporting Agency Theory, which states that financing decisions and the ability to generate profits influence a company's financial health. In practical terms, the findings of this study can serve as a basis for management when formulating capital structure policies and strategies to improve profitability, thereby reducing the risk of financial distress. For investors and creditors, leverage and profitability can be utilised as early indicators in assessing a company's risk, whilst for regulators, the results of this study can provide input into the development of an early warning system for companies at risk of a deterioration in their financial condition.

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