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DETERMINANTS OF FINANCIAL DISTRESS USING A BINARY APPROACH: EVIDENCE FROM PROPERTY AND REAL ESTATE FIRMS ON THE IDX (2014–2023)

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ABSTRACT

The study explores factors that influence the probability of distress on IDX. The study focuses on property and real estate companies. The study measures distress, with a dummy variable, where 1 mark a distressed firm and 0 marks a healthy firm. I looked at profitability, liquidity, solvency and efficiency ratio as indicators. The study used a targeted sampling method to select 36 issuers observed from 2014 to 2023. I tested the relationship, between ratios and financial distress using a regression model. I see that the results show the profitability reduces the chance of the distress. I notice that when the profitability is higher the chance that a firm will face the distress goes down. I see that the liquidity raises the chance of the distress. I notice that when the liquidity is higher, in this sector the liquidity may point to working capital management. I find that the solvency does not change the chance of the distress. I find that the efficiency ratio does not change the chance of the distress either. I see that the findings show the profitability and the liquidity matter for predicting the distress, in the property and real estate industry. I find the study gives information for the investors the creditors and the regulators. The study helps the investors; the creditors and the regulators check the stability and find the warning signs.

INTRODUCTION

Indonesian capital market shows opposite development patterns during last five years. Number of companies that launched their Initial Public Offerings (IPOs) kept rising during this time. Tari (2025) states that Indonesia Stock Exchange experienced its most active period between 2021 and 2025 because new firms' listed at the highest rate since exchange has ever seen. The number of new listings at exchange reached 54 in 2021 before increasing to 59 in 2022 and then to 79 in 2023 and finally to 62 in 2024. Market maintained continuous high investor and firm's interest for public funding throughout 2025.

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The growing number of IPOs has not led to better performance from listed companies that stay listed on the exchange. The IDX delisted 24 issuers from its platform during the period spanning from 2021 to 2025 according to CNBC Indonesia (Setiawati, 2025). The delisting process achieved its highest point during 2025 when ten issuers received simultaneous delisting because of their weak financial condition and negative equity and extended periods of losses and failure to meet reporting requirements and extended trading interruptions and legal problems. The market demonstrates rising distinctions between new businesses that enter the market and established companies which sustain their financial stability after their first public offering.

The property-related companies Cowell Development (COWL) and Forza Land Indonesia (FORZ) and Mas Murni Indonesia (MAMI) and Hanson International (MYRX) faced severe financial problems which led to their delisting from the market. The IDX assigned special notations to these issuers which included negative equity and auditor disclaimer opinions and multiple failures to meet financial reporting standards (Setiawati, 2025). The financial situation of these companies reveals their exposure to financial instability because their debt levels are high and interest rates are volatile.

A company experiences financial distress when it cannot meet its payment responsibilities which results in worsening operational and financial stability. Spector (2019) explains financial problems create higher operational costs and delayed work progress because of weak management and industrial disputes and supply chain breakdowns. Decrease in financial resources leads to faster firms' deterioration according to Cladera et al. (2021) shows why businesses need operational methods to identify financially struggling firms. Research studies have discovered three essential indicators which help forecast financial distress: companies with negative equity (Luu Thu, 2023) multiple years of negative cash flow (Sehgal et al., 2021), and prolonged periods of negative operating cash flows (Wruck, 1990). Indonesian market lacks a standardized model for financial distress assessment so experts use multiple financial performance metrics.

Research indicates that financial performance metrics help predict the probability of financial distress in companies. The existing research data shows wide variations in its results. Research findings indicate profitability results in financial distress according to Abdioğlu (2019); Chen (2018) but Wu (2022) a negative connection between these variables and recent research has shown no connection between the two (Ibrahim & Azzam, 2023). The relationship between Current Ratio and financial distress shows inconsistent results because some studies find a positive link (Luu Thu, 2023; Zhu et al., 2022; Ceylan, 2021; Chen, 2018; Çolak, 2021; Gregova et al., 2020; Waqas & Md-Rus, 2018), while others discover a negative relationship (Hassan et al., 2023) and some studies find no association between the two (Isayas, 2021). The research findings about

leverage and asset efficiency present conflicting results because different studies show different effects (Gyarteng, 2021; Ceylan 2021; Liang et al., 2022).

Literature review

1. Agency Theory

The theory of agency explains how managers (agents) will pursue objectives that differ from those of shareholders (Laskin, 2021). Managers who do not own stock in their companies focus on personal financial gains which leads to agency costs because they need to monitor expenses and implement bonding systems and deal with residual damage (Jensen & Meckling, 1976). The situation of financial distress leads managers to increase their risk-taking activities and delay changes which results in faster firms' deterioration.

2. Bankruptcy

Firms experience financial deterioration because they fail to meet their operational and financial obligations due to persistent losses and rising debt and declining investor confidence (Brigham & Houston, 2019a). The technical definition of insolvency occurs when businesses become unable to fulfill their debt obligations despite having assets that surpass their liabilities but the legal definition of insolvency happens when liabilities surpass asset values (Altman et al., 2017). The two separate financial conditions which Brigham & Houston (2019) identify as economic problems and financial problems lead to firms' failure.

3. Financial distress

Financial distress happens when businesses cannot fulfill their payment responsibilities which creates operational problems and increases their chances of becoming insolvent (Kristanti et al., 2016). Research now uses direct financial indicators to study distress through negative equity (Luu Thu, 2023) and decreasing market value (Luu Thu, 2023) and declining market valuation (Sehgal et al., 2021).

4. Financial ratio

Financial ratios serve as analytical tools for measuring a firm's performance trends, indicating whether its financial condition is improving or deteriorating (Brigham & Houston, 2019). The ratios used in this study are described in Table 1.

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Table 1 *Financial Ratio*

Ratio Category	Definition
Profitability	Measures the firm's capability to generate earnings from its operations over a specific period (Brigham & Houston, 2019)
Liquidity	Evaluate the company's ability to meet short-term liabilities using readily accessible assets (Brigham & Houston, 2019)
Solvency	Evaluates extent to which long-term debt is supported by firm's asset base and its ability to fulfil all financial (Subramanyam, 2017)
Activity (Efficiency)	Measures how effectively the firm utilizes its assets to generate revenue (Brigham & Houston, 2019)

5. Hypothesis Development

Research studies have investigated the relationship between corporate profitability and financial distress. The research by (Abdioğlu, 2019; Chen, 2018) shows that companies with high Return on Equity (ROE) face increased financial risk because they use aggressive funding methods and their profitability becomes less predictable. The research by Wu et al. (2021) shows that businesses which achieve higher earnings performance maintain stronger financial stability which reduces their risk of financial distress. The research by Ibrahim & Azzam (2023) did not discover any significant relationship between these variables. The research hypothesis emerged from theoretical evidence which supports the findings according to Wu et al. (2021), as follows:
H_1: ROE has a significant and negative effect on probability of financial distress.

The research on liquidity produces multiple conflicting results. The studies by Ceylan (2021); Chen (2018); Çolak (2021); Gregova et al. (2020); Luu Thu (2023; Waqas & Md-Rus (2018); Zhu et al. (2022) shows that businesses with better liquidity face higher financial threats because they do not use their assets efficiently and keep too much money idle. The research by Hassan et al. (2023) shows that companies with large cash reserves become less financially unstable but Isayas (2021) and Waqas & Md-Rus (2018) found no significant relationship. The study supports Hassan et al. (2023), this study proposes:
H_2: CR has a significant and negative effect on probability of financial distress.

The Debt to Assets Ratio (DAR) serves as a solvency indicator which researchers have not fully supported through their studies. The research conducted by Fatmayuni et al. (2024); Gregova et al. (2020); Hassan et al. (2023); Luu Thu (2023); Waqas & Md-Rus (2018) demonstrates that companies with excessive debt face higher financial risks because they must pay more debt service costs and lose their ability to make financial decisions. The research conducted by Abdioğlu (2019); Gregova et al. (2020) suggests that leverage may improve firm performance when debt is productively deployed. The

research conducted by Luu Thu (2023)showed that leverage does not affect how well a firm performs. The research supports its findings through experimental data collection and theoretical models:

H_3: DAR has a significant and positive effect on probability of financial distress.

Research findings about asset utilization efficiency present an unclear pattern of results. The research by Ceylan (2021); Luu Thu (2023) shows that financial distress occurs when efficiency ratios rise because it leads to asset-intensive firm problems. The research conducted by Fatmayuni et al. (2024); Gregova et al. (2020); Zhu et al. (2022) demonstrates that organizations which optimize their asset usage will achieve better operational performance while reducing their risk of financial distress. The research conducted by Gyarteng (2021) did not find any significant relationship between the studied variables. The study supports the majority of empirical evidence by stating:

H_4: TATO has a significant and negative effect on probability of financial distress

6. Conceptual Framework

The conceptual framework relationships are summarized in Figure 1.

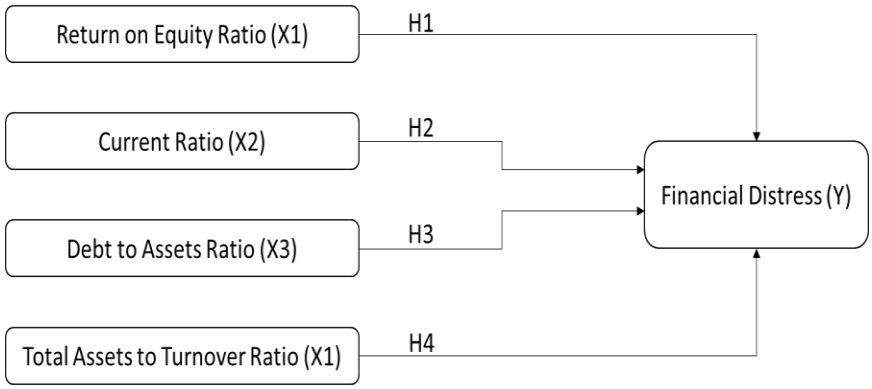

Figure 1. Structural Framework

METHOD

The research design employs quantitative descriptive methods which combine numerical data with statistical methods to test the proposed hypotheses (Bougie & Sekaran, 2016). The research population consists of all property and real estate firms listed on Indonesia Stock Exchange while the sampling method involves purposive selection. The research includes property and real estate sector firms that operated on Indonesia Stock Exchange between 2014 and 2023 while excluding financial institutions and companies that withdrew their IPOs and organizations without accessible annual reports on their websites or IDX portal. The research team identified 36 firms which met all study criteria.

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The research data comes from two sources: corporate financial statements available on company websites and stock price information retrieved from public financial platforms including sahamidx.com and finance.yahoo.com and investing.com.

The research variables receive their operational definitions from Table 2.

Table 2. Operational Definition of Variable

Variable	Descriptive	Description
Y	Company Status 1: Financially distressed company 0: Healthy company	Negative equity (3 consecutive years) Negative profit (3 consecutive years) (Luu Thu, 2023)
X_1	Profitability Ratio	ROE = NI / CE (Brigham & Houston, 2019)
X_3	Liquidity Ratio	CR= CA/CL (Brigham & Houston, 2019)
X_3	Solvency Ratio	DtA= TL/TA (Brigham & Houston, 2019)
X_4	Activity Ratio	TATO =Sales/TA (Brigham & Houston, 2019)

Note: CA: Current Assets; CE: Common Equity; CL: Current Liability; CR: Current Ratio; DtA: Debt to assets ratio; NI: Net Income; ROE: Return on Equity; TA = Total Assets; TATO: Total Assets Turnover ratio; TL = Total Liability.

The research design uses descriptive quantitative methods with statistical evaluation to analyze financial ratio effects on financial distress risk. The research team performed all data processing operations through STATA. The research starts by creating descriptive statistics which present essential data characteristics through observation numbers and value ranges and mean values and standard deviations. The analysis uses logistic modeling with Cox regression and Breslow method to predict financial distress because the dependent variable exists as a binary value.

$$FD_{(1|0)} = h_i(t) = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik}$$

Description:

FD = Financial distress if the company is in a healthy condition, it is assessed as 0, and if the company is experiencing a financial crisis, it is assessed as 1

Pi = The probability that the firm is suffering from financial distress

X1 = return on assets

X2 = current ratio

X3 = debts to assets ratio

X4 = total assets turnover

RESULTS AND DISCUSSION

1. Descriptive Statistical Analysis

The research used descriptive statistics to analyze the data characteristics. The analysis shows number of observations, mean score, standard deviation, minimum and maximum scores for every variable. The descriptive results summary appears in Table 3.

Table 3. Descriptive Statistics

Variabel	Observation	Mean	Std. dev	Min	Max
FD	360	.3611111	.4809912	0	1
ROE	360	.0479629	.1123719	-.5762188	.4801055
CR	360	3.70439	6.198535	. 2077274	65.59248
DAR	360	.3756298	. 1722068	. 0125196	.7776966
TATO	360	.1732673	.1012552	. 0042861	.7237835

Source: STATA 17

The data summary in Table 3 shows the main characteristics of the dataset. The financial distress category includes 36% of all observations. The average ROE value stays at a low level but the standard deviation stays high which shows that different firms in the sample achieve varying levels of profitability. The current ratio shows a high average value but its standard deviation is wide which indicates that liquidity levels between firms differ significantly. The DAR variable shows a stable middle-level average value with no changes in its distribution pattern. The TATO variable maintains a low average value while showing minimal changes in its distribution.

2. Tabulate financial distress

The research shows how companies distributed their issuances between financially stable and distressed entities during 2014–2023. The results appear in table 4.

Table 4 Tabulate financial distress 2014-2023

FD	Freq.	Percent	Cum
0	57	63.3	63.3
1	33	36.7	100.00
Total	90	100.00	

Note: 0 = Healthy issuer; 1 = *financial distress* issuer

Financial health status of companies shows 63.33% healthy and 36.67% distressed based on Table 4. Financial distress category demonstrates substantial industry vulnerability.

3. Goodness of fit

The Cox regression model needs the proportional-hazards assumption for conducting data assessment. The model remains suitable for interpretation when the Prob>chi² value reaches higher levels because it indicates no violation of the proportional-hazards requirement. The results of this goodness of fit appear in Table 5.

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Table 5. Test of proportional-hazards assumption

FD	Chi2	df	Prob>chi2
Global Test	11.50	4	0.215

The proportional-hazards assumption test (Table 5) shows a chi2 11.50 with probability 0.215 which exceeds the 0.05 threshold. The Cox model demonstrates appropriate and statistically reliable performance for financial distress analysis because it does not violate the proportional-hazards requirement.

4. Cox regression with Breslow method

Proportional Cox Hazard model examines how different explanatory factors affect event occurrence at specific points in time. The Cox regression results appear in Table 6.

Tabel 6. *Proportional Cox Hazard*

Number of Obs = 360

Log likelihood = -655.80778 Prob > chi2 = 0.0122

_t	Coefficient	Std. error.	z	P>|z|	[95% conf. interval]	
ROE	-2.383459	.0639181	-3.44	0.001	.0237124	.3587386
CR	.0203293	.0103363	2.01	0.045	1.000478	1.040999
DAR	.0516319	.5934018	0.09	0.927	.3489286	3.177681
TATO	1.0506057	2.497753	1.20	0.229	.5161583	15.84184

Source: STATA 17

From table 6. Proportional Cox Hazard regression equation is obtained as follows:

$$FD_{(1|0)} = h_i(t) = \alpha - 2{,}383\, ROE + 0{,}02\, CR + 0{,}051\, DAR + 1{,}051\, TATO$$

The Proportional Cox Hazard results (Table 4.6) demonstrate that the complete model achieves statistical significance at p = 0.0122 (LR χ^2 = 12.81) which proves that independent variables affect financial distress results. The results show that ROE has a statistically significant negative effect which decreases financial distress risk. The current ratio shows a statistically significant positive relationship which indicates that better liquidity levels increase the risk of financial distress. The model does not show strong relationships between financial distress and both leverage and asset efficiency. The model shows that financial distress depends only on profitability and liquidity as its two essential predictors.

5. Hazard ratio - cox regression with Breslow method

The hazard ratio function enables researchers to measure relative risk levels which demonstrate how each variable affects financial distress probability at different time points. The interpretation of hazard ratios proves easier than regression coefficients

because any value above one indicates increased distress risk and any value below one indicates decreased risk. The Cox proportional hazards model produced hazard ratio estimates which are presented in Table 7.

Table 7 Cox regression with Breslow's approach

Number of Obs = 360

Log likelihood = -655.80778 Prob > chi2 = 0.0122

_t	Haz ratio	Std. error.	z	P>|z|	[95% conf.	interval]
ROE	.092231	.0639181	-3.44	0.001	.0237124	.3587386
CR	1.020537	.0103363	2.01	0.045	1.000478	1.040999
DAR	1.052988	.5934018	0.09	0.927	.3489286	3.177681
TATO	2.859528	2.497753	1.20	0.229	.5161583	15.84184

Source: STATA 17

Based on The Cox regression and hazard ratio results indicate that ROE significantly That ROE significantly decreases probability of financial distress, as indicated by its negative coefficient and hazard ratio of 0.092, meaning a 1-unit increase in profitability lowers distress risk by about 90.8% (H_1 supported). The current ratio shows a small but significant positive effect, with a hazard ratio of 1.02, suggesting that higher liquidity increases distress probability by roughly 2%, likely due to inefficient working-capital structures (H_2 supported). In contrast, both conversely, both solvency and activity ratio showed insignificant coefficients as well as a hazard ratio close to one, indicating that leverage and asset utilization did not significantly predict distress in the sample. (H_3 and H_4 rejected).

6. Discussion

Hazard ratio results show following hypothesis outcomes for each studied variable.

a. The impact of profitability on probability of a firm having financial distress

The research findings show that return on equity (ROE) negatively affects the chances of financial problems among property companies listed on the Indonesia Stock Exchange. The research results show that profitability acts as a stabilizing element for industries which use high leverage and work on long-term projects and need substantial funding. A higher ROE value indicates that companies generate superior equity returns which enables them to fund their operations through equity rather than debt in the property and real estate sector where cash flow instability and construction delays are common. Companies with high ROE values show better financial stability because they handle market pressure effectively which decreases their chances of financial problems. The combination of weak operational results from low ROE values

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because it shows poor operational results and higher financing expenses that decrease net income and boost financial distress risks. The research findings from this study confirm the results which Wu et al. (2021), who demonstrated that higher profits lead to lower financial condition deterioration risks.

The research results oppose Abdioğlu (2019); Chen (2018); Ibrahim & Azzam (2023), who found profitability and financial distress either had a positive link or no meaningful statistical relationship.

b. The impact of liquidity on probability of a firm having financial distress

The current ratio showed a positive relationship with financial distress probability for all property companies operating on the Indonesia Stock Exchange. The results show unexpected patterns because property and real estate businesses maintain most of their current assets through land reserves and unfinished development projects and construction sites. The assets in these inventories maintain their non-liquid status because they do not have quick cash conversion capabilities. Companies with elevated current ratios seem liquid on paper but their ability to produce quick cash remains restricted. The combination of high inventory levels creates two major problems which reduce working capital efficiency and create financial instability during times of project delays and market slowdowns.

The research findings match previous studies by Ceylan (2021); Chen (2018); Çolak (2021); Gregova et al. (2020); Luu Thu (2023); Waqas & Md-Rus (2018); Zhu et al. (2022), shows that inventory-heavy current assets produce misleading liquidity readings. The research findings differ from Hassan et al. (2023); Isayas (2021); Waqas & Md-Rus (2018), because they found no connection between liquidity and financial distress.

c. The impact solvency on probability of a firm having financial distress

The research results show that the debt-to-asset ratio fails to produce meaningful results for predicting financial distress among Indonesia Stock Exchange listed property firms. The ratio shows how debt financing affects total assets but its lack of significance proves that leverage does not serve as an effective warning sign for financial problems in property and real estate businesses. The property sector requires substantial debt financing because it needs large amounts of capital to operate and because projects take extended periods to complete and external funding sources must be used extensively. The financial stability of companies that obtain big loans for business operations remains intact because investors predict their projects will succeed and they will meet their future payment obligations. The company achieves financial stability through its asset value management system even though it uses aggressive financing approaches that include high debt levels.

The solvency ratio fails to evaluate financial vulnerability does not show enough changes so interest coverage ratio and cash flow-based leverage indicators might provide better risk assessment for property companies. The research findings match Luu Thu (2023), because he discovered no meaningful connection between the variables. The study findings disagree with Abdioğlu (2019); Ceylan (2021); Fatmayuni et al. (2024); Gregova et al. (2020); Hassan et al. (2023); Waqas & Md-Rus (2018), who found positive or negative relationships between solvency and financial distress.

d. The impact efficiency on probability of a firm having financial distress

The research findings show that efficiency ratio does not create any substantial risk for financial distress among property companies that trade on the Indonesia Stock Exchange. The property and real estate sector face unstable revenue patterns because its financial performance relies on the completion of projects and pre-sales achievements and current market trends. The unstable nature of annual sales figures makes total asset turnover an unreliable indicator for evaluating company financial stability. Property companies maintain extensive asset portfolios which include land reserves and ongoing construction projects and extended development initiatives so their sales efficiency does not directly indicate their short-term financial stability.

The specific characteristics of this sector require organizations to use project completion ratios and inventory turnover for finished goods and ongoing development cash inflows instead of total asset turnover for distress risk assessment. The research results match Gyarteng (2021), because his study found no connection between asset turnover and financial distress. The research findings disagree with Ceylan (2021); Fatmayuni et al. (2024); Gregova et al. (2020); Luu Thu (2023); Wu et al. (2021); Zhu et al. (2022), who document either a positive or negative influence.

CONCLUSION

The research shows profitability stands as a vital element which enables businesses to defend their financial stability because organizations with higher profitability achieve superior financial stability results. The analysis demonstrates that liquidity creates a strong positive link with financial distress occurrence. The research data indicates that financial distress probability does not affect the solvency and efficiency ratio in any meaningful way. The research shows that profitability and liquidity quality act as vital elements which determine financial health performance in Indonesia's property industry.

The research contains multiple restrictions which affect its results. The research findings from this study apply only to property sector businesses because they do not represent other business sectors. The study fails to evaluate how the studied variables

affect financial distress over time while economic conditions shift. The model fails to account for all variables which affect financial distress because it lacks essential factors such as macroeconomic conditions and governance quality and market cycles and project-specific risks. The research needs to include these variables to create a full method for financial distress prediction.

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