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The Impact of Financial Distress on Firm Value: The Moderating Role of Macroeconomic Factors in Indonesian Property and Real Estate Companies (2019–2023)

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A B S T R A C T
Examining property and real estate firms listed on the Indonesia Stock Exchange (IDX) between 2019 and 2023, this paper evaluates how financial distress affects market valuation alongside the potential moderating effect of interest rates. Financial vulnerability was measured using the Altman Z"-Score model, whereas firm value was assessed through the Price-to-Book Value (PBV) ratio. Applying panel data regression and Moderated Regression Analysis (MRA) in EViews, the empirical results indicate that financial distress exerts a pronounced influence on firm value, as declining corporate health systematically undermines investor perception. In contrast, interest rates fail to show a significant moderating role in this relationship, suggesting that the negative valuation impact of financial distress persists independently of prevailing interest rate environments. These outcomes offer relevant considerations for managers, market participants, and regulators evaluating firm stability amidst broader economic shifts.

INTRODUCTION

The property and real estate sector serve as a fundamental pillar of the Indonesian economy, functioning not only to meet housing demand but also as a critical barometer of national economic vitality. In an increasingly dynamic global economy, this sector faces structural headwinds that threaten corporate performance and long-term sustainability. Notably, the sector's contribution to Indonesia's Gross Domestic Product (GDP) has exhibited a concerning downward trajectory, contracting from 2.92% in the third quarter of 2020 to 2.33% by mid-2024 (BPS, 2024). This macro-level slowdown underscores the urgent need to evaluate the underlying factors shaping corporate performance and market valuation within this strategic industry.

Firm value represents a crucial metric reflecting management's efficacy in resource allocation and strategic goal achievement (Ningrum, 2022). Enhanced firm value signifies superior shareholder wealth creation, thereby elevating investor return prospects. In capital markets, market valuation is fundamentally encapsulated by stock prices, which convey investor expectations regarding a firm's growth potential (Cahyaningrum & Ahmadi, 2025). However, the market valuation of listed Indonesian property and real estate firms as measured by Price to Book Value (PBV) remains sub-optimal. A significant majority of companies in this sector trade at a PBV below 1.0, indicating that equity prices currently lag behind the underlying book value of their net assets.



Figure 1. PBV of Property and Real Estate Companies in 2023

Conversely, financial distress arises when a firm experiences a substantial deterioration in its financial performance (Sulistiyowati & Devinaya, 2022). A higher leverage or debt burden increases the probability of entering financial distress, which, if unmitigated, can ultimately trigger corporate insolvency and bankruptcy (Eftasari & Desriani, 2025). Early indicators of financial distress manifest through multiple operational and structural metrics, including asset contraction, eroding profitability, declining revenues, and escalating debt obligations (Bahrum et al., 2024). Empirical assessments using the Altman Z''-Score reveal considerable heterogeneity across property companies, with several operating near the threshold of the safe zone underscoring their potential vulnerability to financial distress in response to adverse macroeconomic shocks.



Figure 2. Z-Score Values of Property and Real Estate Companies in 2023

Prior literature has examined the relationship between financial distress and firm value through diverse theoretical lenses. Trade-Off Theory posits that while leverage can initially enhance firm value via interest tax shields, exceeding optimal debt capacity escalates financial distress risk, ultimately depressing corporate valuation (Hasnawati, 2020). From a Signaling Theory perspective, financial distress conveys negative signals to the capital market regarding a firm's future prospects, triggering share price declines and valuation discounts (Wawo & Nirwana, 2020). Furthermore, Agency Theory highlights that financial distress intensifies agency conflicts between managers and shareholders, thereby jeopardizing firm value (Lewier et al., 2024). Although empirical studies such as Sari (2022) demonstrate a significant association between financial distress and firm value, most research focuses predominantly on manufacturing or cross-sectoral samples, leaving sector-specific evidence in property and real estate relatively scarce. Moreover, existing studies frequently examine direct relationships without incorporating external moderating variables, particularly macroeconomic conditions that heavily influence real estate dynamics.

To address these literature gaps, the primary novelty of this study lies in integrating interest rates as a macroeconomic moderating variable to re-evaluate the financial distress–firm value nexus within the property and real estate sector. This approach offers a novel contribution by providing a more nuanced understanding of how external macroeconomic shifts buffer or exacerbate the internal effects of financial distress on firm valuation. Given that the property sector is uniquely sensitive to interest rate fluctuations due to its heavy reliance on mortgage and debt financing, incorporating interest rates fills a critical empirical gap. Accordingly, this study analyzes the effect of financial distress on firm value, moderated by interest rates, among property and real estate firms listed on the Indonesia Stock Exchange (IDX) from 2019 to 2023, offering valuable empirical evidence on the interplay between internal financial vulnerability and external economic conditions.

LITERATURE REVIEW

The theoretical foundation of this study is built upon five relevant theories that explain the relationship between financial distress, firm value, and the moderating role of interest rates:

Signaling Theory

Signaling theory proposed by Spence (1973) asserts that asymmetric information between company management and external investors leads management to send signals regarding the company's internal condition and future prospects. In financial management, a company's financial health serves as a critical signal to the market. When a firm exhibits good financial health evidenced by a high Altman Z''-Score investors interpret this as a positive signal (good news), which enhances market confidence and drives up stock prices, leading to an increase in Price to Book Value (PBV) (Wawo & Nirwana, 2020). Conversely, indications of financial distress convey a negative signal (bad news) that triggers adverse market reactions and reduces firm value.

Trade-off Theory

Trade-off theory, developed by Kraus and Litzenberger (1973), states that firms balance the tax-shield benefits of debt financing against the potential costs of financial distress and bankruptcy. Increasing debt up to an optimal capital structure enhances firm value through interest tax deductions. However, beyond this optimal point, additional debt exponentially increases the probability of financial distress and bankruptcy costs, ultimately diminishing firm value (Hasnawati, 2020; Umdiana et al., 2021). In the property and real estate sector, which relies heavily on leverage, trade-off theory helps explain how excessive debt exposure threatens firm valuation.

Agency Theory

Agency theory, formalized by Jensen and Meckling (1976), addresses the potential conflicts of interest between principal shareholders and agent managers, as well as between equity holders and debt holders. When a firm enters financial distress, agency conflicts intensify. Managers may engage in risky decision-making or under-investment to preserve liquidity, while creditors may impose restrictive covenants. These agency problems generate agency costs of financial distress that impair operational efficiency and erode total firm value (Lewier et al., 2024).

Bankruptcy Theory and Financial Distress

Bankruptcy theory, pioneered by Altman (1968), defines financial distress as a stage where a firm's operational cash flows are insufficient to satisfy its current debt obligations, potentially leading to insolvency or liquidation. Altman's modified Z''-Score model integrates multiple financial metrics—including working capital ratio, retained earnings ratio, operating margin, and capital structure ratio—to assess the risk of bankruptcy. Companies experiencing financial distress face higher cost of capital, lower supplier trust, and declining market valuation due to the perceived risk of business disruption (Bahrum et al., 2024; Sulistiyowati & Devinaya, 2022).

Macroeconomic Interest Rate Parity / Transmission Theory

Macroeconomic transmission theory (Mishkin, 1995) explains how monetary policy adjustments, particularly central bank interest rates (e.g., BI

Rate), propagate through financial institutions into real economic activities. In capital-intensive industries such as property and real estate, interest rates directly impact cost of capital, consumer mortgage demand (KPR), and debt servicing burdens (Fauzi et al., 2023). High interest rates elevate borrowing costs and decrease demand, which can exacerbate the adverse impact of financial distress on firm valuation (Wafi et al., 2021).

METHODOLOGY

Sample Description

This study adopts a quantitative methodology featuring descriptive and verificative approaches to evaluate the effect of financial distress on firm value, alongside the moderating role of interest rates. Designed as a causal-explanatory investigation, the research analyzes empirical relationships among the specified variables within property and real estate companies listed on the Indonesia Stock Exchange (IDX) over the 2019–2023 period.

The research population comprises 92 listed property and real estate firms. A non-probability purposive sampling method was employed based on explicit inclusion criteria: (1) continuous listing on the IDX Main Board during the 2019–2023 observation period, (2) availability of complete financial report indicators required for variable measurement, and (3) absence of extreme outlier ratios.

The empirical framework models a causal structure with financial distress as the independent variable, firm value as the dependent variable, and the Bank Indonesia Benchmark Interest Rate (BI Rate) as the moderating variable. Data collection and empirical analysis were executed over a six-month period from February to July 2025.

Data Collection Method

Empirical data for this study were gathered from secondary sources comprising a panel dataset (combining time-series and cross-sectional observations). Firm-level secondary data, specifically audited annual financial statements and stock market metrics, were collected from the official Indonesia Stock Exchange portal (www.idx.co.id) and individual corporate websites. Macroeconomic data regarding the benchmark interest rate (BI Rate) were retrieved from Bank Indonesia's official portal. Data collection was executed using documentation and literature review techniques. The documentation method involved systematically archiving annual reports and financial statements of the sampled property and real estate firms across the observation period. Concurrently, the literature study entailed a comprehensive review of academic journals, books, and empirical literature pertinent to financial distress, firm valuation, and macroeconomic moderation dynamics.

Data Analysis Method

This study uses inferential statistics to test statistical hypotheses derived from the research sample. Data analysis techniques include descriptive analysis and verifiable analysis processed using EViews 12 software. This study uses three main variables. The dependent variable, company value (Y), is measured using the Price-to-Book Value (PBV) ratio, which is calculated using the formula of

market price divided by book value per share. The independent variable, financial distress (X), is measured using a modification of the Altman Z"-Score for non-manufacturing companies in developing countries using the formula:

$$Z'' = 6{,}56X_1 + 3{,}26X_2 + 6{,}72X_3 + 1{,}05X_4,$$

where:
X_1: working capital to total assets
X_2: retained earnings to total assets
X_3: EBIT to total assets
X_4: book value of equity to total liabilities.

The moderating variable, interest rate (Z), is represented by the BI Rate percentage obtained from official Bank Indonesia data. Meanwhile, the tabulated data was further processed using e-views and tested using Data Panel.

Panel Data Regression Analysis

Panel data integrates cross-sectional units observed across multiple time horizons (Sugiarto & Salim, 2025). To evaluate both direct and moderated effects, the moderated panel data regression model is specified as follows:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_{it} + \beta_3 (X_{it} \times Z_{it}) + \varepsilon_{it}$$

Where:

- Y_{it} = Firm value (Price to Book Value) of property and real estate firm i in year t (2019–2023)
- α = Constant term (intercept)
- $\beta_1, \beta_2, \beta_3$ = Regression slope coefficients
- X_{it} = Financial distress (Altman Z"-Score) of firm i in year t
- Z_{it} = Moderating variable (Interest rate / BI Rate) in year t
- $X_{it} \times Z_{it}$ = Interaction term between financial distress and interest rate
- ε_{it} = Stochastic error term

Estimation Approach and Model Selection

Panel data parameters can be estimated using three standard specification models:

- **Common Effect Model (CEM):** Assumes uniform intercept and slope coefficients across all cross-sectional units and time periods, estimating parameters via Ordinary Least Squares (OLS).
- **Fixed Effect Model (FEM):** Allows intercepts to vary across individual entities while holding slope coefficients constant, typically estimated using the Least Squares Dummy Variable (LSDV) technique.
- **Random Effect Model (REM):** Assumes cross-sectional intercept variations are random and uncorrelated with independent variables, estimated using Generalized Least Squares (GLS).

Selecting the optimal regression specification involves three empirical tests: the Chow Test (CEM vs. FEM), the Hausman Test (FEM vs. REM), and the Lagrange Multiplier Test (CEM vs. REM). Based on these diagnostic assessments,

the Random Effect Model (REM) was determined to be the most appropriate specification for this study.

RESEARCH RESULT

The specified Random Effect Model (REM) was subjected to rigorous diagnostic testing for classical econometric assumptions, successfully passing tests for normality, multicollinearity, heteroscedasticity, and serial correlation. Consequently, the model satisfies the Best Linear Unbiased Estimator (BLUE) properties, ensuring the statistical validity and reliability of the empirical estimations. The summary of the data processing results is presented below:

Table 1. Regression Test of the Effect of Financial Distress on Company Value with Macroeconomics as a Moderating Variable

Dependent Variable: LOG(Y)
Method: Panel EGLS (Cross-section random effects)
Date: 07/08/25 Time: 01:37
Sample: 2019 2023
Periods included: 5
Cross-sections included: 10
Total panel (balanced) observations: 50
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.998790	0.247018	-4.043387	0.0002
X	0.117232	0.055783	2.101559	0.0411
M	-0.240559	0.418776	-0.574435	0.5685
XM	0.012790	0.104786	0.122059	0.9034

Effects Specification	S.D.	Rho
Cross-section random	0.401422	0.7243
Idiosyncratic random	0.247668	0.2757

Weighted Statistics			
R-squared	0.178142	Mean dependent var	-0.175684
Adjusted R-squared	0.124543	S.D. dependent var	0.272911
S.E. of regression	0.255352	Sum squared resid	2.999403
F-statistic	3.323584	Durbin-Watson stat	0.943295
Prob(F-statistic)	0.027734		

The resulting regression equation is as follows:

$$\text{Company Value} = -0.999 + 0{,}117_{FD} - 0{,}240_{M} + 0{,}0128_{FDM} + et$$

With Hypothesis:

H_0 : Financial distress partially has no significant effect on company value.

H_a : Financial distress partially has a significant effect on company value.

H_0 : Macroeconomics, which moderates the relationship between financial distress and company value, does not have a significant partial effect on company value.

H_a : Macroeconomics, which moderates the relationship between financial distress and company value, has a significant partial effect on company value.

DISCUSSION

This study empirical examines the effect of financial distress operationalized via the Altman Z''-Score on firm value (PBV), alongside the moderating role of interest rates as a macroeconomic variable. The empirical findings reveal that financial distress significantly affects PBV ($p = 0.0411 < 0.05$). This indicates that superior corporate financial health translates directly into higher market valuations. A higher Altman Z''-Score places a firm in the safe zone, signifying low bankruptcy risk and conveying positive signals to capital markets. Enhanced market confidence subsequently strengthens investor trust regarding the firm's long-term prospects. These results align with Signaling Theory, which posits that strong financial health serves as a credible signal of favorable future performance, supporting investment decisions and driving market valuation. These outcomes align with prior literature confirming the critical role of financial health in determining firm value, notably studies by Sari (2022) and Damayanti et al. (2023), which demonstrated that lower financial pressure boosts investor confidence in a firm's profitability and business continuity.

Conversely, the interaction term between financial distress and the macroeconomic variable (FD × Macroeconomics) yielded a non-significant probability value ($p = 0.9034 > 0.05$). This confirms that interest rates do not moderate the relationship between financial distress and PBV. In other words, short-term macroeconomic interest rate fluctuations neither amplify nor buffer the impact of internal financial health on market valuation. This outcome contrasts with Raisa and Jonnardi (2025), who found that interest rates significantly moderated the effects of profitability and leverage components embedded within the Altman Z''-Score framework on firm value.

However, our findings align with Yunaningsih and Sapruwan (2023), who observed that interest rates fail to significantly moderate the effects of capital structure and profitability on firm value. The non-significant moderating role may be partially explained by the model's coefficient of determination ($R^2 = 0.178$), which indicates that only 17.8% of PBV variance is explained by financial distress and interest rates, while the remaining 82.2% is driven by unexamined factors such as dividend policy, profitability, capital structure, and market sentiment. From the perspective of Trade-Off Theory, which explains how firms balance debt tax shields against distress costs to achieve optimal capital structure, if a firm operates near its optimal financing threshold, short-term interest rate shifts will not fundamentally alter financing strategies. Consequently, interest rates exert negligible moderating leverage over the distress–valuation relationship. In the property and real estate industry, investors prioritize core internal fundamentals such as solvency and profitability over external monetary fluctuations. Furthermore, due to the long-term investment horizon

characteristic of real estate, interest rate shifts are not immediately priced into market valuations.

Overall, this research provides empirical evidence that internal financial conditions remain the primary driver of corporate value, whereas interest rates do not play a significant moderating role. These findings offer practical implications for corporate management, highlighting the necessity of prioritizing internal financial strengthening strategies, as investors predominantly evaluate core financial stability when determining market valuations.

CONCLUSIONS AND RECOMMENDATIONS

This study yields several critical insights into the impact of financial distress on firm value (PBV) and the moderating influence of interest rates as a macroeconomic variable. First, financial distress evaluated via the Altman Z''-Score exerts a statistically significant effect on firm value. This indicates that superior corporate financial health directly enhances market valuation, aligning with Signaling Theory, which posits that sound financial health conveys positive signals to capital markets and bolsters investor confidence.

Second, the benchmark interest rate does not significantly moderate the relationship between financial distress and firm value. This suggests that interest rate fluctuations neither amplify nor attenuate the effect of internal financial stability on market performance. Consequently, future research should explore additional, highly relevant determinants. Internally, future investigations could consider liquidity, cash holdings, profitability, capital structure, and dividend policy, as these factors directly dictate fundamental corporate strength. Externally, variables such as economic policy uncertainty, inflation rates, exchange rate volatility, GDP growth, and property market dynamics could better capture broader macroeconomic shifts. Integrating these constructs will provide a more comprehensive framework for evaluating the financial distress–firm value nexus.

Overall, this research concludes that internal financial health remains the primary driver of corporate valuation, whereas interest rates offer negligible moderating utility. From a managerial standpoint, corporate leaders must prioritize internal strategies aimed at improving and maintaining robust financial health, as fundamental stability remains the primary criterion utilized by investors when evaluating market performance.

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