

THE EFFECT OF DEBT TO EQUITY RATIO, TOTAL ASSET TURNOVER, AND SALES GROWTH
ON RETURN ON ASSETS IN PROPERTY AND REAL ESTATE COMPANIES LISTED ON THE
INDONESIA STOCK EXCHANGE, 2021-2025Darminsyah Putra Manggopa¹, Maryam Mangantar², Vionalisa Chandra³Department of management, Faculty of Economics and Business, Sam Ratulangi University
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Abstract

This study examines the effect of Debt to Equity Ratio (DER), Total Asset Turnover (TATO), and Sales Growth on Return on Assets (ROA) in property and real estate companies listed on the Indonesia Stock Exchange during 2021-2025, controlling for inflation, the policy interest rate, and the IDXPROPERT index. Panel data regression was applied to 240 observations from 48 companies selected through purposive sampling. The Fixed Effect Model was chosen through the Chow and Hausman tests, and heteroscedasticity was corrected using robust standard errors. The results show that DER, TATO, and Sales Growth jointly have a significant effect on ROA. Partially, only TATO has a positive and significant effect, indicating that efficient asset utilization is the main driver of profitability, whereas DER and Sales Growth have no significant effect. These findings are interpreted through Trade-Off Theory, DuPont Analysis, growth theory, and Signaling Theory.

Keywords: *Debt to Equity Ratio, Total Asset Turnover, Sales Growth, Return on Assets, and Property Sector*

Abstrak

Tulis Penelitian ini bertujuan menguji pengaruh *Debt to Equity Ratio* (DER), *Total Asset Turnover* (TATO), dan *Sales Growth* terhadap *Return on Assets* (ROA) pada perusahaan sektor properti dan *real estate* yang terdaftar di Bursa Efek Indonesia periode 2021-2025, dengan inflasi, suku bunga, dan IDXPROPERT sebagai variabel kontrol. Regresi data panel diterapkan pada 240 observasi dari 48 perusahaan yang dipilih melalui *purposive sampling*. *Fixed Effect Model* dipilih melalui Uji Chow dan Uji Hausman, dan heteroskedastisitas dikoreksi menggunakan *robust standard error*. Hasil penelitian menunjukkan bahwa DER, TATO, dan *Sales Growth* secara simultan berpengaruh signifikan terhadap ROA. Secara parsial, hanya TATO yang berpengaruh positif dan signifikan, yang mengindikasikan bahwa efisiensi pemanfaatan aset merupakan penentu utama profitabilitas, sedangkan DER dan *Sales Growth* tidak berpengaruh signifikan. Temuan ini dianalisis melalui *Trade-Off Theory*, *DuPont Analysis*, teori pertumbuhan perusahaan, dan *Signaling Theory*.

Kata Kunci: *Debt to Equity Ratio, Total Asset Turnover, Sales Growth, Return on Assets, dan Sektor Properti*

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1. Pendahuluan

Profitability is a key indicator of corporate performance, as it reflects a firm's ability to generate earnings and signals important information to investors, creditors, and other stakeholders. Among the various profitability measures, *Return on Assets* (ROA) is the most

widely used, since it captures how effectively a company deploys its total assets to produce net income [1]. The property and real estate sector is a strategic driver of economic growth, and the 2021-2025 period brought unusually sharp swings for this industry: Indonesia's economy rebounded from a 2.07 percent contraction in 2020 to 5.11 percent growth in 2025 [2], the IDX Properties & Real Estate sectoral index gained 54.41 percent over the course of 2025 [3], Bank Indonesia cut its policy rate five times for a cumulative 125 basis points down to 4.75 percent [4], and the government expanded VAT-borne-by-government incentives for landed houses and apartment units [5].

Yet a review of the financial statements of 48 firms in this sector reveals opposing trends: the average *Debt to Equity Ratio* (DER) rose from 0.41 times in 2021 to 0.49 times in 2025, while average ROA fell from 1.67 percent in 2023 to 0.73 percent in 2025. This pattern hints at a possible negative relationship between debt financing and profitability, though no firm conclusion can be drawn without statistical testing that controls for other factors. Three financial factors are theoretically relevant to ROA: capital structure (DER), asset efficiency (*Total Asset Turnover*, TATO), and business growth (*Sales Growth*). *Trade-Off Theory* holds that an optimal capital structure is reached when the tax benefits of debt are balanced against the costs of *financial distress* [6]; *DuPont Analysis* treats asset turnover as one of the components that build profitability [7]; and growth theory views firm growth as a dynamic capability that lifts earnings when paired with cost efficiency [8]. Empirical evidence points in different directions: sales growth has been found to raise profitability among *consumer cyclicals* firms [9] as well as property firms [10], while asset efficiency is regarded as an important determinant of profitability in asset-heavy property companies [11]. Even so, a joint test of these three ratios that also controls for recent macroeconomic conditions, including the 2025 rate cuts, has yet to be carried out.

The novelty of this study rests on three points: an observation period, 2021-2025, that spans the post-pandemic recovery through the sharp 2025 rate cuts; panel data regression across 48 firms (240 observations) that accommodates cross-firm heterogeneity and corrects for heteroscedasticity using *robust standard errors*; and the inclusion of inflation, the interest rate, and the IDXPROPERT sector index as control variables, which helps separate the influence of macroeconomic conditions from that of firm-level financial ratios.

Accordingly, this study aims to examine and analyze the effect of DER, TATO, and *Sales Growth* on ROA among property and real estate companies listed on the Indonesia Stock Exchange during 2021-2025, both partially and simultaneously, while controlling for inflation, the interest rate, and IDXPROPERT.

2. Literature Review

2.1 Theoretical Foundation

Trade-Off Theory holds that an optimal capital structure is reached when the tax benefits of debt (the *tax shield*) are balanced against the costs of *financial distress* that arise from higher bankruptcy risk; once that optimal point is exceeded, additional debt actually erodes firm profitability [6]. DER, the ratio of total debt to total equity [1], captures this capital-structure risk directly: in property companies that require large amounts of capital to develop their projects, a high DER raises interest expense and financial risk, which can in turn suppress net income and ROA.

DuPont Analysis breaks profitability down into profit margin, asset turnover, and the equity multiplier [7]. TATO represents the asset-turnover component, that is, the sales generated per rupiah of assets [12]; the higher the TATO, the larger its contribution to ROA, and this efficiency in asset use is regarded as an important determinant of profitability for asset-heavy property companies [11].

The theory of firm growth views growth as a dynamic capability through which a company expands its market share and revenue [8]. *Sales Growth* captures the increase in sales from one period to the next [13], [14] and lifts ROA when the rise in revenue outpaces the accompanying rise in costs; conversely, when growth is accompanied by a larger increase in costs, its contribution to profitability can turn out to be non-significant [9].

Signaling Theory explains that firms reduce information asymmetry by conveying signals to outside parties through the financial ratios they publish [15]; here it is treated as a complementary lens for interpreting the results rather than a source of separate hypotheses. Inflation, for its part, affects both construction costs and consumer purchasing power, while the policy interest rate affects project financing costs and mortgage installments [16]; inflation has also been linked to firm value and market performance in the property sector [17], [18]. The IDXPROPERTY index is included to capture aggregate market sentiment toward the sector, separate from each company's own fundamental performance.

2.2 Hypothesis Development

Under *Trade-Off Theory*, debt levels that exceed the optimal point erode profitability [6], consistent with the negative DER effect reported by Lim [9]; this leads to H1: DER has a negative and significant effect on ROA. Under *DuPont Analysis*, efficient asset turnover is a primary building block of profitability [7], [11], leading to H2: TATO has a positive and significant effect on ROA. Under the theory of firm growth, *Sales Growth* can raise ROA when it is accompanied by cost efficiency [8], consistent with the positive effect reported by Lim [9] and by Manurung and Hasyim [10], leading to H3: *Sales Growth* has a positive and significant effect on ROA. Taken together, these three ratios represent the dimensions of capital-structure risk, operational asset efficiency, and business growth that, in theory, jointly shape profitability [6], [7], [8], leading to H4: DER, TATO, and *Sales Growth* jointly have a significant effect on ROA, with inflation, the interest rate, and IDXPROPERTY included as control variables that are not themselves part of the hypotheses.

3. Research Methodology

This study adopts a quantitative approach using secondary data in the form of annual financial statements, analyzed through panel data regression, a technique that combines cross-firm and cross-time variation. This approach was chosen because every variable can be measured directly from financial-ratio data and official publications, and because panel regression is able to capture unobserved differences across firms, such as scale of operations, project location, developer reputation, and management strategy.

The population comprises all 90 property and real estate companies listed on the Indonesia Stock Exchange. The sample was determined through *purposive sampling* using four criteria: (1) listed no later than January 1, 2021 and not *delisted* at any point during 2021-2025; (2) no *initial public offering* after January 1, 2021; (3) consistently classified as a property and real estate issuer throughout the study period; and (4) publication of complete, audited annual

reports for 2021-2025. The selection process yielded 48 companies, producing 240 observations (48 companies $\times$ 5 years) in a balanced panel (Table 1).

Table 1. Sample Selection Process

No.	Description	Number of Companies
1	Property and real estate companies listed on the IDX	90
2	Companies that conducted an IPO after January 1, 2021	(15)
3	Companies not consistently classified in the property and real estate sector	(2)
4	Companies that did not publish complete, audited annual reports for 2021-2025	(25)
	Total research sample	48
	Total observations (48 companies $\times$ 5 years)	240

Source: www.idx.co.id and each company's annual reports, processed by the authors (2026).

Data on ROA, DER, TATO, and *Sales Growth* were drawn from audited annual reports and financial statements downloaded from the Indonesia Stock Exchange website (www.idx.co.id) and from each company's own website. Inflation and interest-rate data came from Bank Indonesia publications, while IDXPROPERT data came from the Exchange's historical index records. Data were collected through documentation. The operational definitions of the variables are presented in Table 2.

Table 2. Operational Definitions of Variables

Variable	Measurement	Data Source	
ROA (Y)	Net income $\div$ Total assets	Company statements	financial
DER (X1)	Total liabilities $\div$ Total equity	Company statements	financial
TATO (X2)	Total sales $\div$ Total assets	Company statements	financial
Sales Growth (X3)	$(\text{Sales } t - \text{Sales } t-1) \div \text{Sales } t-1$	Company income statements	
Inflation (control)	$(\text{CPI } t - \text{CPI } t-1) \div \text{CPI } t-1$	Bank Indonesia	
Interest Rate (control)	Year-end BI-Rate (%)	Bank Indonesia	
IDXPROPERT (control)	Year-on-year change in the IDXPROPERT index	Indonesia Stock Exchange	

Source: compiled by the authors from various references (2026).

Data analysis proceeded in several stages using Stata 17. First, descriptive statistics were used to examine the characteristics of the data; extreme values in DER and *Sales Growth* were treated through *winsorizing* at the 1st and 99th percentiles, without reducing the number of observations. Second, the estimation model was chosen among the *Common Effect Model* (CEM), *Fixed Effect Model* (FEM), and *Random Effect Model* (REM) using the Chow and Hausman tests. Third, classical assumption tests were conducted, including the *Variance Inflation Factor* (VIF) for multicollinearity, the Shapiro-Wilk test for residual normality, the Wooldridge test for autocorrelation, and the *Modified Wald* test for heteroscedasticity. Where heteroscedasticity was detected in the FEM, the model was re-estimated with *robust standard errors* clustered by firm. The regression model estimated is specified as follows.

$$ROA_{it} = \alpha_i + B_1DER_{it} + B_2TATO_{it} + B_3SG_{it} + B_4Inflasi_t + B_5SukuBunga_t + B_6IDXPROPERTY_t + \varepsilon_{it} \quad (1)$$

In Equation (1), α_i is the firm-specific intercept (the fixed effect), B_1 - B_3 are the coefficients of the independent variables, B_4 - B_6 are the coefficients of the control variables, i indexes firms (1, 2, ..., 48), t indexes years (2021-2025), and ε is the *error term*. The partial hypothesis tests (t-tests) for H1-H3 are one-tailed, since the direction of each effect was predicted in advance by theory. Because Stata reports two-tailed p-values, H0 (the coefficient equals zero) is rejected when the two-tailed p-value divided by two is below 0.05 and the sign of the coefficient matches the hypothesized direction. The simultaneous hypothesis (H4) is tested with an F-test on DER, TATO, and *Sales Growth* (the *testparm* command), with H0 rejected when the p-value is below 0.05. Model fit is reported through the within R^2 coefficient of determination.

4. Results and Discussion

4.1 Descriptive Statistics

Table 3 presents descriptive statistics for all variables before *winsorizing*. The mean ROA of 0.015 (1.5 percent), with a range from -0.450 to 0.430, points to wide variation in profitability, including firms that recorded losses. The mean DER of 0.432 times indicates that debt is generally smaller than equity, while the mean TATO of only 0.140 times reflects the asset-heavy nature of the industry. *Sales Growth* shows very large dispersion (standard deviation of 12.874; maximum of 174.6, or 17,460 percent), consistent with a revenue-recognition pattern tied to unit handover (PSAK 72) that can produce sharp sales spikes in a given year. All subsequent estimations therefore use the *winsorized* versions of DER and *Sales Growth*, with the number of observations unchanged at 240.

Table 3. Descriptive Statistics (Before Winsorizing)

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
ROA	240	0.015	0.065	-0.450	0.430
DER	240	0.432	0.449	0.010	2.860
TATO	240	0.140	0.102	0.010	0.820
Sales Growth	240	1.344	12.874	-0.940	174.600
Inflation	240	0.028	0.010	0.020	0.040
Interest Rate	240	0.050	0.009	0.040	0.060
IDXPROPERTY	240	0.066	0.247	-0.180	0.530

Source: Stata 17 output, processed by the authors (2026). All ratios are expressed in decimal form (0.015 = 1.5 percent).

4.2 Model Selection and Classical Assumption Tests

The results of model selection and the classical assumption tests are presented in Table 4. The Chow test rejected H0, indicating that the FEM is preferable to the CEM, and the Hausman test likewise favored the FEM over the REM. Within the FEM, all VIF values fall well below 10, indicating no multicollinearity, and the Wooldridge test shows no evidence of autocorrelation. The residuals are not normally distributed, but with 240 observations, statistical inference remains reliable under the *Central Limit Theorem*. The *Modified Wald Test* detected

heteroscedasticity, so the final model was re-estimated using the FEM with *robust standard errors* clustered by the 48 companies.

Table 4. Model Selection and Classical Assumption Test Results

Test	Statistic	p-value	Decision
Chow Test	$F(47, 186) = 7.17$	0.0000	FEM preferred over CEM
Hausman Test	$\chi^2(6) = 19.87$	0.0029	FEM preferred over REM
Multicollinearity (VIF)	Mean 1.14; maximum 1.31	—	No multicollinearity
Normality (Shapiro-Wilk)	$W = 0.76606$; $z = 8.619$	0.0000	Residuals not normally distributed
Autocorrelation (Wooldridge)	$F(1, 47) = 0.038$	0.8456	No autocorrelation
Heteroscedasticity (Modified Wald)	$\chi^2(48) = 25,983.61$	0.0000	Heteroscedasticity present

Source: Stata 17 output, processed by the authors (2026). The Hausman test was accompanied by the note “V_b-V_B is not positive definite,” which is common for panel data with $T = 5$ per firm and does not affect the test decision.

4.3 Final Model Estimation Results and Hypothesis Testing

Table 5 compares the plain FEM with the FEM using *robust standard errors*, the latter serving as the final model. The coefficients are identical across both specifications, since the correction only affects the *standard errors*. After correction, DER, which had appeared significant in the plain FEM, becomes non-significant (its *standard error* rises from 0.0140 to 0.0427), while TATO remains significant at the 1 percent level ($t = 4.60$). The final model is significant overall, with a within R^2 of 0.4110, meaning the model explains 41.10 percent of the within-firm variation in ROA.

Table 5. FEM and FEM with Robust Standard Error Estimation Results (Final Model)

Variable	FEM	FEM Robust	p-value (FEM Robust)
DER	0.0643*** (0.0140)	0.0643 (0.0427)	0.139
TATO	0.3998*** (0.0438)	0.3998*** (0.0870)	0.000
Sales Growth	-0.0010 (0.0028)	-0.0010 (0.0034)	0.777
Inflation	0.2356 (0.2747)	0.2356 (0.2160)	0.281
Interest Rate	-0.2849 (0.2975)	-0.2849 (0.2389)	0.239
IDXPROPERT	-0.0126 (0.0115)	-0.0126 (0.0152)	0.411
Constant	-0.0597*** (0.0174)	-0.0597** (0.0233)	< 0.05
Observations / firms	240 / 48	240 / 48	
R^2 within	0.4110	0.4110	

Source: Stata 17 output, processed by the authors (2026). Figures in parentheses are *standard errors*; *** $p < 0.01$; ** $p < 0.05$. Final model: $F(6, 47) = 3.68$ ($p = 0.0044$).

A summary of the hypothesis tests based on the final model is presented in Table 6. Hypotheses H1-H3 were tested one-tailed following the criteria set out in the methodology section. None of the three control variables, inflation, the interest rate, and IDXPROPERT, has a significant effect on ROA.

Table 6. Hypothesis Test Summary

Hypothesis	Coefficient	p-value (two-tailed)	p-value/2	Decision
H1: DER has a negative effect on ROA	0.0643	0.139	0.0695	Rejected (opposite sign; $p/2 > 0.05$)
H2: TATO has a positive effect on ROA	0.3998	0.000	0.000	Accepted
H3: Sales Growth has a positive effect on ROA	-0.0010	0.777	0.3885	Rejected (opposite sign; $p/2 > 0.05$)
H4: DER, TATO, and Sales Growth jointly affect ROA	$F(3, 47) = 7.29$	0.0004	—	Accepted

Source: Stata 17 output, processed by the authors (2026).

4.4 Discussion

The results show that DER does not have a significant negative effect on ROA; if anything, the coefficient runs in the opposite direction. This finding does not support the prediction of *Trade-Off Theory* that higher debt erodes profitability through interest expense and the risk of *financial distress* [6], and it departs from the negative effect that Lim [9] reported for *consumer cyclicals* firms. The non-significance is closely tied to the *robust standard error* correction: DER appears significant under the plain FEM only because heteroscedasticity understates its *standard error*, and that significance does not survive the correction. Beyond this, most of the variation in ROA appears to be driven by fixed differences across firms, such as developer reputation, project location, and business model, rather than by year-to-year changes in DER within the same firm; this is consistent with the individual-effect component accounting for 68.01 percent of the total error variance. The 2025 rate cuts may also mean that a rising DER increasingly reflects low-cost expansion rather than distress risk, which would make its effect inconsistent across firms and over time. This last explanation is interpretive and would need to be tested directly in future work.

TATO is confirmed to have a positive and significant effect on ROA, in line with the *DuPont Analysis* framework, which treats asset turnover as a building block of profitability [7]. This is the strongest result among the three main variables, since it remains significant after the *robust standard error* correction. In quantitative terms, the coefficient of 0.3998 implies that a 0.10-times increase in TATO is associated with roughly a 0.040 increase in ROA (4.0 percentage points), *ceteris paribus*. This result is consistent with the view that efficient asset use is an important determinant of profitability in asset-heavy property companies [11]. In an industry where the average TATO is only 0.140, how efficiently a firm converts its assets into sales stands out as the most reliable driver of profitability, regardless of shifts in capital structure or macroeconomic conditions over 2021-2025.

Sales Growth is not found to have a significant positive effect on ROA; in fact, its coefficient runs negative. This departs from the positive effect reported by Lim [9] and by Manurung and Hasyim [10]. Growth theory suggests that sales growth only translates into higher profitability when revenue gains outpace the accompanying rise in costs [8]. In the property sector, sales

spikes tied to revenue recognition at unit handover tend to be a one-year phenomenon and can coincide with higher cost of goods sold, marketing expenses, and construction costs within the same period, so their net contribution to ROA tends to cancel out. Even after extreme values were tempered through *winsorizing*, this revenue-recognition pattern still needs to be kept in mind when interpreting the result.

Taken jointly, DER, TATO, and *Sales Growth* have a significant effect on ROA, even though only TATO is significant on its own. This joint significance appears to be carried mainly by TATO's contribution. The non-significance of the control variables suggests that macroeconomic conditions and sector-wide market sentiment affect all firms in the sample fairly uniformly, and therefore do little to explain differences in profitability across firms; including them nonetheless remains useful for keeping the estimated effects of the three main variables free from year-to-year confounding.

Theoretically, these results suggest that the relevance of *Trade-Off Theory* for explaining the link between capital structure and profitability is context-dependent and hinges on prevailing monetary conditions; they reinforce the validity of *DuPont Analysis* for asset-heavy firms; and they add nuance to growth theory by showing that sales growth does not automatically translate into higher profitability without accompanying cost control. Practically, management should prioritize efficient asset utilization, while investors should be cautious about relying on sales growth or debt levels alone as a gauge of profitability.

5. Conclusion

This study examined the effect of DER, TATO, and *Sales Growth* on ROA among 48 property and real estate companies listed on the Indonesia Stock Exchange during 2021-2025, controlling for inflation, the interest rate, and IDXPROPERT. Based on *Fixed Effect Model* panel regression with *robust standard errors*, it can be concluded that (1) DER does not have a significant negative effect on ROA; (2) TATO has a positive and significant effect on ROA; (3) *Sales Growth* does not have a significant positive effect on ROA; and (4) DER, TATO, and *Sales Growth* jointly have a significant effect on ROA. The model explains 41.10 percent of the within-firm variation in ROA, with asset-turnover efficiency standing out as the most dominant determinant.

These findings imply that property-company management should treat asset-management efficiency as a top priority, exercise caution before treating additional debt as a profitability strategy, and make sure that sales growth is matched by cost discipline. For investors, asset-turnover efficiency is a reasonable primary indicator for assessing the profitability quality of issuers in this sector, while for regulators, consistent application of revenue-recognition accounting standards has a direct bearing on how sales-growth and profitability ratios should be interpreted.

This study is subject to several limitations. Its scope is confined to the property and real estate sector over an observation period marked by unusual economic conditions; a portion of the variation in ROA is still explained by factors outside the model; the residuals are not normally distributed and *Sales Growth* contains extreme values tied to its revenue-recognition pattern; and the macroeconomic control variables are annual aggregates, giving only five time points. Future research could add variables such as firm size, liquidity, corporate governance, the exchange rate, and property-credit growth; use alternative profitability proxies such as *Return on Equity* or *Net Profit Margin*; separate organic sales growth from spikes driven by unit

handovers; and extend the observation period while comparing the results against other sectors.

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