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Debt to Equity Ratio, Fixed Investment Efficiency, Export Volume, and Exchange Rate Fluctuations: Effects on Property Firms' Operating Profit Margin

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Abstract

This study aims to analyze the effect of the Debt to Equity Ratio, Fixed Investment Efficiency, Export Volume, and Exchange Rate Fluctuations on the Operating Profit Margin of property and real estate companies listed on the Indonesia Stock Exchange during the 2020–2025 period. The study uses a quantitative approach with secondary data obtained from the companies' annual financial reports. Purposive sampling was applied, yielding 312 observations that met the research criteria. The data were analyzed using panel data regression with the random effects model, estimated by the Estimated Generalized Least Squares (EGLS) method. Outliers were detected using the extreme residual method, which was also used to test normality and evaluate regression model errors, while EGLS was used to estimate the panel data regression model and to address violations of the classical assumptions, particularly heteroscedasticity and autocorrelation. The partial results show that the Debt to Equity Ratio has a negative and significant effect on the Operating Profit Margin, and Export Volume has a positive and significant effect, whereas Fixed Investment Efficiency and Exchange Rate Fluctuations have no significant effect. Simultaneously, the Debt to Equity Ratio, Fixed Investment Efficiency, Export Volume, and Exchange Rate Fluctuations significantly affect the Operating Profit Margin. The Adjusted R-squared value of 0.056045 indicates that the four independent variables explain 5.60% of the variation in the margin, while the remaining 94.40% is explained by variables outside the research model.

Keywords: *Debt to Equity Ratio; Fixed Investment Efficiency; Export Volume; Exchange Rate Fluctuations; Operating Profit Margin*

I. INTRODUCTION

A. Background

The property and real estate sector is one of the key foundations of a national economy and has a very large multiplier effect. As a capital-intensive industry, the sector not only meets the basic need for housing but also drives more than 170 related industrial sub-sectors, such as construction, building materials, and financial services. Changes in the performance of this sector often serve as an indicator of overall economic conditions and of investor confidence on the Indonesia Stock Exchange (Aristaldo & Rahmiyati, 2022).

The property and real estate sector plays an important role in the economy because it is closely related to development, investment, and various other economic activities. In running their businesses, property and real estate companies face various economic conditions that may affect their financial performance, particularly their ability to generate profit from operating activities. The 2020–2025 period is of particular interest because it covers the pandemic, the economic recovery, and various changes in economic conditions that may affect corporate activities (Kuncoro, 2018).

One of the main indicators used to assess a company's investment efficiency is the Operating Profit Margin (OPM). OPM is a ratio that measures the percentage of operating profit relative to a company's net sales. The higher the OPM, the more effectively the company uses its expenses to generate sales; conversely, a lower OPM indicates a lower operating profit earned on net sales (Alda et al., 2024).

The internal factors affecting the operating profit margin are the Debt to Equity Ratio (DER) and fixed investment efficiency, while the external factors examined in this study are export volume and exchange rate fluctuations. DER describes the company's funding structure through the ratio of debt to equity. Excessive use of debt can increase the company's burden, whereas appropriate capital structure management can support operating activities. Fixed investment efficiency relates to the company's ability to use its fixed assets to generate revenue. Meanwhile, export volume can provide opportunities for revenue growth, whereas changes in the exchange rate can affect the company's costs and revenues, particularly those related to foreign currency transactions.

Previous studies show mixed results regarding the factors that affect the operating profit margin. Maricar and Almalita (2022) and Marlina (2022) showed that the debt to equity ratio and exchange rate fluctuations have no effect on the operating profit margin, whereas fixed investment efficiency and export volume were found to affect it. Furthermore, Riri and Martilova (2022) found that DER and exchange rate fluctuations have a negative effect on the operating profit margin. Meanwhile, Nisa'ul Jannah and Rahayu Suryaningsum (2024) found that exchange rate fluctuations have a negative effect on the operating profit margin.

These differences in findings indicate that a research gap remains regarding the effect of DER, fixed investment efficiency, export volume, and exchange rate fluctuations on the operating profit margin. Previous studies also show inconsistencies among their results. Therefore, this study was conducted to obtain empirical evidence on the effect of the Debt to Equity Ratio, fixed investment efficiency, export volume, and exchange rate fluctuations on the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025.

B. Problem Formulation

1. Does the debt to equity ratio affect the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025?
2. Does fixed investment efficiency affect the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025?

3. Does export volume affect the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025?
4. Do exchange rate fluctuations affect the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025?
5. Do the debt to equity ratio, fixed investment efficiency, export volume, and exchange rate fluctuations jointly affect the operating profit margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025?

C. *Research Objectives*

This study aims to determine and analyze the effect of the Debt to Equity Ratio, Fixed Investment Efficiency, Export Volume, and Exchange Rate Fluctuations on the Operating Profit Margin, both partially and simultaneously, in property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025.

II. LITERATURE REVIEW

A. *Theoretical Framework*

This study uses Trade-off Theory and the Theory of the Firm. Trade-off Theory explains that every company gradually adjusts toward an optimal debt ratio. Meanwhile, the Theory of the Firm is used to understand how companies make decisions regarding production, pricing, and the allocation of resources in order to optimize profit.

The Operating Profit Margin is the profit that a company earns from its core business activities after deducting operating expenses but before interest and taxes. Profit is the part of the financial statements that presents the actual condition of the company (Mulyati et al., 2021). The Debt to Equity Ratio is used to measure the amount of the company's own capital that serves as collateral for debt. This ratio is useful for determining the amount of funds provided by creditors relative to the owners of the company, and how much each rupiah of equity serves as collateral for debt (R. Purba & Mahendra, 2022). Fixed Investment Efficiency, often referred to as fixed asset turnover, measures the amount of sales generated for each unit of fixed assets owned by the company. Efficient use of fixed assets can directly affect profit margins and business continuity. Export volume is the quantity, or physical amount, of goods shipped by a country abroad (to international markets) within a certain period (Shapawatul Janah, 2024). Exchange rate fluctuation, commonly referred to as the foreign exchange rate, is the comparison of the value or price of two different currencies, in which the price of a foreign currency is expressed in the local currency.

B. *Previous Research*

Previous studies are used as a basis for examining the relationships among the variables studied and for identifying the research gap. Puspitasari and Thoha (2021) found that DER has a positive and significant effect on profit growth, while several other variables have no significant effect.

Riri and Martilova (2022) found that changes in the Operating Profit Margin do not directly cause significant changes in profit. Meanwhile, Maricar and Almalita (2022) found that Fixed Asset Turnover has a negative effect on earnings management, whereas leverage and profitability have a positive effect. Riri and Martilova (2022) also showed that DER and exchange rate fluctuations have a negative effect on the operating profit margin. In addition, Nisa'ul Jannah and Rahayu Suryaningsum (2024) found that exchange rate fluctuations have a negative effect on the operating profit margin.

Based on these previous studies, there are still differences in findings regarding the effect of DER, fixed investment efficiency, export volume, and exchange rate fluctuations on the operating profit margin. These differing findings constitute a research gap and form the basis for conducting this research again on property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025.

III. METHOD

A. Research Type

This study uses a quantitative approach with a positivist paradigm and a deductive method. The research focuses on testing causal hypotheses using secondary data obtained from the companies' annual financial reports.

B. Population and Sample

The research population consists of all property and real estate companies listed on the Indonesia Stock Exchange (IDX) during 2020–2025, totaling 94 companies. The sample was determined using purposive sampling, with the criteria that the company was listed on the IDX throughout the research period and published an annual report. Based on these criteria, 52 companies were obtained as the sample, with 312 observations over six years of observation.

C. Data Collection Method

Data were collected using the documentation method, that is, by gathering secondary data in the form of financial statements and annual reports of the sampled property and real estate companies for 2020–2025. These data were used to obtain information on the debt to equity ratio, fixed investment efficiency, export volume, exchange rate fluctuations, and operating profit margin. The study uses secondary data from the companies' annual financial reports.

D. Data Analysis Method

The data were analyzed using panel data regression with the EViews application. The model was selected through the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test to determine the most appropriate regression model. Hypotheses were then tested using the t-test (partial), the F-test (simultaneous), and the coefficient of determination (R^2). In the results, the model used is the Random Effect Model (REM) with the Estimated Generalized Least Squares (EGLS) method to estimate the panel data regression and to address heteroscedasticity and autocorrelation.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics Analysis

TABLE I. DESCRIPTIVE ANALYSIS RESULTS

	OPM	DER	FATO	VE	KURS
Mean	0.321080	-0.695186	1.198923	8.464605	0.027153
Median	0.315567	-0.515970	1.166618	8.821900	0.011600
Maximum	0.488796	1.560632	2.896030	9.723300	0.102500
Minimum	0.215541	-6.067340	-0.869797	6.255800	-0.020000
Std. Dev.	0.044952	1.177818	0.273056	1.153835	0.042554
Observations	238	238	238	238	238

Source: Data processed using EViews (2026)

Table I shows that this study uses 238 observations from property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025. The table presents the descriptive statistics of the Operating Profit Margin (OPM), Debt to Equity Ratio (DER), Fixed Investment Efficiency (FATO), Export Volume (VE), and Exchange Rate Fluctuations (KURS) in the research sample.

B. Research Model

TABLE II. RANDOM EFFECT MODEL ESTIMATION RESULTS

Dependent Variable: OPM; Method: Panel EGLS (Cross-section random effects)				
Sample: 2020 2025; Periods included: 6; Cross-sections included: 50; Total panel (unbalanced) observations: 238				
Swamy and Arora estimator of component variances				
Variable	Coefficient t	Std. Error	t-Statistic	Prob.
C	0.273603	0.018987	14.41031	0.0000
DER	-0.008569	0.003340	-2.565858	0.0109
FATO	-0.002937	0.008579	-0.342312	0.7324
VE	0.005058	0.001665	3.038148	0.0027
KURS	0.037921	0.044945	0.843714	0.3997
Effects Specification			S.D.	Rho
Cross-section random			0.033112	0.5799
Idiosyncratic random			0.028184	0.4201
Weighted Statistics				
R-squared	0.071977	Mean dependent var		0.113611
Adjusted R-squared	0.056045	S.D. dependent var		0.033774
S.E. of regression	0.028477	Sum squared resid		0.188949
F-statistic	4.517811	Durbin-Watson stat		1.550952
Prob(F-statistic)	0.001560			
Unweighted Statistics				
R-squared	0.092913	Mean dependent var		0.321080
Sum squared resid	0.434401	Durbin-Watson stat		0.674610

Source: Data processed using EViews (2026)

$$OPM = 0.273603 - 0.008569 DER - 0.002937 FATO + 0.005058 VE + 0.037921 KURS$$

Based on Table II, the equation shows that the constant is 0.273603, while the regression coefficients of the independent variables are -0.008569 for the Debt to Equity Ratio (DER), -0.002937 for Fixed Investment Efficiency (FATO), 0.005058 for Export Volume (VE), and 0.037921 for Exchange Rate Fluctuations (KURS).

C. Panel Data Regression Model Selection

TABLE III. PANEL DATA MODEL SELECTION TEST RESULTS

Test	Statistic	Value	d.f.	Prob.	Decision
Chow test	Cross-section F	7.365748	(49,184)	0.0000	Fixed Effect Model (FEM)
	Cross-section Chi-square	258.398095	49	0.0000	
Hausman test	Cross-section random	4.287112	4	0.3685	Random Effect Model (REM)
Lagrange Multiplier test (Breusch-Pagan)	Cross-section	140.0249	-	0.0000	Random Effect Model (REM)
	Period	2.690108	-	0.1010	
	Both	142.7150	-	0.0000	

Source: Data processed using EViews (2026)

Table III summarizes the three tests used to select the panel data regression model. The Chow test yields a Cross-section F value of 7.365748 with a probability of 0.0000 and a Cross-section Chi-square value of 258.398095 with a probability of 0.0000. These probabilities are smaller than 0.05, so H_0 is rejected and H_a is accepted. Thus, the *Fixed Effect Model* (FEM) is more appropriate than the *Common Effect Model* (CEM).

The Hausman test yields a Cross-section random value of 4.287112 with a probability of 0.3685. This probability is greater than 0.05, so H_0 is accepted and H_a is rejected. Thus, the *Random Effect Model* (REM) is more appropriate than the *Fixed Effect Model* (FEM).

The Lagrange Multiplier test yields a Breusch-Pagan value for the cross-section of 140.0249 with a probability of 0.0000. This probability is smaller than 0.05, so H_0 is rejected and H_a is accepted. Thus, the *Random Effect Model* (REM) is more appropriate than the *Common Effect Model* (CEM). This decision reinforces the result of the Hausman test. Therefore, based on all stages of panel data regression model selection, the *Random Effect Model* (REM) was established as the estimation model used in this study because it best fits the characteristics of the research data.

D. Partial Test (t-Test)

TABLE IV. PARTIAL TEST (T-TEST) RESULTS

Variable	Coefficient	t-Statistic	Prob.	Remarks
DER	-0.008569	-2.565858	0.0109	H1 Accepted
FATO	-0.002937	-0.342312	0.7324	H2 Rejected
VE	0.005058	3.038148	0.0027	H3 Accepted
KURS	0.037921	0.843714	0.3997	H4 Rejected

Source: Data processed using EViews (2026)

Table IV presents the partial test results. Decision-making in the partial test in this study is based on the probability value (Sig.) and the calculated t value compared with the t table value. The t table value is obtained from the degrees of freedom (df) with the formula $df = n - k$, where the sample size (n) is 238 and the number of variables (k) is 5, giving a df of 233. At the 5% significance level ($\alpha = 0.05$) and this df, the t table value is 1.970.

E. Simultaneous Test (F-Test) and Coefficient of Determination

TABLE V. SIMULTANEOUS TEST (F-TEST) AND COEFFICIENT OF DETERMINATION (R-SQUARED) RESULTS

F-statistic	Prob(F-statistic)	Remarks	R-squared	Adjusted R-squared
4.517811	0.001560	H5 Accepted	0.071977	0.056045

Source: Data processed using EViews (2026)

Table V shows that the simultaneous test yields a calculated F value of 4.517811 with a probability (Prob. F-statistic) of 0.001560. This probability is smaller than 0.05 and the calculated F value is greater than the F table value of 2.410, so H0 is rejected and H5 is accepted. Thus, the Debt to Equity Ratio (DER), Fixed Investment Efficiency (FATO), Export Volume (VE), and Exchange Rate Fluctuations (KURS) simultaneously have a significant effect on the Operating Profit Margin (OPM).

Table V also shows an R-squared value of 0.071977 and an Adjusted R-squared value of 0.056045. In this study, the coefficient of determination is interpreted using the Adjusted R-squared because it is adjusted for the number of independent variables and the number of observations. The Adjusted R-squared value of 0.056045 indicates that the Debt to Equity Ratio (DER), Fixed Investment Efficiency (FATO), Export Volume (VE), and Exchange Rate Fluctuations (KURS) together explain 5.60% of the variation in the Operating Profit Margin (OPM), while the remaining 94.40% is explained by other variables outside the research model that were not included in the analysis.

F. Discussion

1) Effect of the Debt to Equity Ratio on the Operating Profit Margin

The results show that the Debt to Equity Ratio (DER) has a regression coefficient of -0.008569 , a significance value of 0.0109, and a t-statistic of -2.565858 . The significance value is smaller than 0.05 and the absolute t-statistic of 2.565858 is greater than the t table value of 1.970, so H1 is accepted. Thus, the Debt to Equity Ratio (DER) has a negative and significant effect on the Operating Profit Margin (OPM).

2) Effect of Fixed Investment Efficiency on the Operating Profit Margin

The results show that Fixed Investment Efficiency (FATO) has a regression coefficient of -0.002937 , a significance value of 0.7324, and a t-statistic of -0.342312 . The significance value is greater than 0.05 and the absolute t-statistic of 0.342312 is smaller than the t table value of 1.970, so H2 is rejected. Thus, Fixed Investment Efficiency (FATO) has a negative but insignificant effect on the Operating Profit Margin (OPM).

3) Effect of Export Volume on the Operating Profit Margin

The results show that Export Volume (VE) has a regression coefficient of 0.005058, a significance value of 0.0027, and a t-statistic of 3.038148. The significance value is smaller than 0.05 and the t-statistic of 3.038148 is greater than the t table value of 1.970, so H3 is accepted. Thus, Export Volume (VE) has a positive and significant effect on the Operating Profit Margin (OPM).

4) Effect of Exchange Rate Fluctuations on the Operating Profit Margin

The results show that Exchange Rate Fluctuations (KURS) have a regression coefficient of 0.037921, a significance value of 0.3997, and a t-statistic of 0.843714. The significance value is greater than 0.05 and the t-statistic of 0.843714 is smaller than the t table value of 1.970, so H4 is rejected. Thus, Exchange Rate Fluctuations (KURS) have a positive but insignificant effect on the Operating Profit Margin (OPM).

V. CONCLUSIONS

A. Conclusion

Based on the results of the study, it can be concluded that the Debt to Equity Ratio has a negative and significant effect on the Operating Profit Margin; Fixed Investment Efficiency, proxied by Fixed Asset

Turnover, has a negative but insignificant effect on the Operating Profit Margin; Export Volume has a positive and significant effect on the Operating Profit Margin; and Exchange Rate Fluctuations have a positive but insignificant effect on the Operating Profit Margin.

The Debt to Equity Ratio, Fixed Investment Efficiency, Export Volume, and Exchange Rate Fluctuations simultaneously affect the Operating Profit Margin of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2025. This is shown by the calculated F value of 4.517811, which is greater than the F table value of 2.410, with a significance value of 0.001560, which is smaller than 0.05, so H5 is accepted.

B. Suggestions

Based on the results of the study, the following suggestions can be offered.

1) For Companies

Property and real estate companies are expected to manage their capital structure more optimally by maintaining a balance between debt and equity financing. Excessive use of debt should be avoided because it can increase interest expenses and reduce the company's ability to generate operating profit. Companies also need to improve the effectiveness of their marketing strategies and expand market opportunities so that the increase in operating revenue can offset the costs incurred during project development. Companies are also expected to optimize the use of fixed assets by accelerating project completion, increasing sales, and managing assets more productively. Although Fixed Investment Efficiency does not show a significant effect in this study, effective management of fixed assets remains necessary to support the company's long-term growth.

2) For Investors

Investors are advised to pay attention not only to a company's profitability but also to its capital structure, the development of its sales volume, and its ability to manage financial risk before making investment decisions. Information on the Debt to Equity Ratio and the development of the company's operating activities can be used as considerations in assessing the prospects of property and real estate companies.

3) For Future Researchers

Future studies are expected to add other variables that may affect the Operating Profit Margin, such as firm size, sales growth, liquidity, inflation, interest rates, and corporate governance. Future studies may also extend the research object to other industrial sectors or use a longer research period so that the results are more comprehensive and have a better level of generalizability.

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