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The Effect Of Capital Structure On Profitability (A Study On Infrastructure Sector Companies Listed On The Indonesia Stock Exchange For The Period 2020–2024)

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Abstract: *The infrastructure sector plays a strategic role in Indonesia's economic development due to its capital-intensive nature and long-term investment characteristics. Sound financial management, particularly in determining an optimal capital structure, is essential for maintaining profitability and ensuring sustainable growth. However, empirical evidence regarding the relationship between capital structure and profitability remains inconclusive, especially in the post-pandemic period. This study aims to examine the effect of capital structure on profitability in infrastructure sector companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. Capital structure is measured using the Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), and Long-Term Debt to Total Assets (LTDtA), while profitability is proxied by Return on Assets (ROA). This research employs a quantitative approach using panel data from 39 infrastructure companies, resulting in 195 observations. Multiple linear regression analysis is applied to test both partial and simultaneous effects of the independent variables on profitability. Classical assumption tests, including normality, multicollinearity, and heteroskedasticity, are conducted to ensure the robustness of the regression model. The results of the F-test indicate that DAR, DER, and LTDtA simultaneously do not have a significant effect on ROA. However, the t-test reveals that LTDtA has a positive and significant effect on profitability, while DAR and DER show no significant influence. These findings suggest that overall leverage does not necessarily enhance profitability in infrastructure companies, but the appropriate use of long-term debt can improve performance through tax shield benefits and support long-term project financing. This study contributes to the literature by providing empirical evidence on capital structure decisions in Indonesia's infrastructure sector during the post-pandemic period. The findings offer practical implications for corporate managers, investors, and policymakers in formulating effective financing strategies that balance financial risk and profitability.*
Keywords: *Capital Structure, Debt To Asset Ratio (DAR), Debt To Equity Ratio (DER), Long-Term Debt To Total Asset (LTDtA), Return On Assets (ROA).*

INTRODUCTION

The infrastructure sector in Indonesia plays a crucial role in supporting national development and promoting sustainable economic growth. High-quality infrastructure provides physical facilities such as roads, ports, airports, power plants, and communication networks, but it also serves as a foundation for economic, social, and cultural activities across the archipelago (Nasikhah & Susilowati, 2024; World Bank, 2023). The availability of quality infrastructure

directly contributes to increased productivity, distribution efficiency, and national competitiveness, especially amid intensifying global challenges.

This study focuses on examining the relationship between capital structure and profitability in infrastructure companies listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024. The selection of this sector is based on its strategic role as a driver of national connectivity, a reducer of regional disparities, and a key supporter of digital transformation and industrial acceleration in Indonesia (Ministry of National Development Planning/Bappenas, 2020; OECD, 2022).

Several previous studies have investigated the effect of capital structure on financial performance across various industries. For example, Pratama and Sufina (2023) found a positive relationship between the Debt to Equity Ratio (DER) and profitability (Return on Assets/ROA) in infrastructure companies during 2018–2022, indicating that optimal debt usage can enhance operational efficiency. However, another study published in *Coopetition: Jurnal Ilmiah Manajemen* (2022) revealed that high leverage can negatively impact profitability when financed assets fail to generate immediate cash flows.

The theoretical frameworks most frequently employed in these studies include the Trade-Off Theory (Myers, 1984), which emphasizes balancing the benefits and costs of debt, and the Pecking Order Theory (Myers & Majluf, 1984), which explains firms' financing preferences, starting from internal funds, then debt, and finally external equity.

Despite the valuable insights provided by previous research, several limitations remain. Many studies used pre-pandemic data or did not account for macroeconomic factors such as fiscal stimulus and post-COVID economic recovery. Additionally, few studies incorporated moderating variables such as firm size or government policies, which may influence the relationship between leverage and profitability. Consequently, existing findings often fail to capture the real dynamics of Indonesia's infrastructure sector in the face of economic shocks and structural adjustments (World Bank, 2021; IMF, 2023).

To address this research gap, this study aims to analyze how the Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), and Long-Term Debt to Total Assets (LTDTA) affect the profitability of infrastructure companies listed on the IDX during 2020–2024. The study employs a panel data

regression approach, measuring profitability through Return on Assets (ROA) and capital structure indicators including DAR, DER, and LTDTA. The analysis is grounded in Trade-Off and Pecking Order theories, which remain relevant for explaining corporate financing behavior in the post-pandemic context (Brigham & Houston, 2021; Titman & Wessels, 2019).

This study provides important theoretical and practical contributions. Theoretically, it extends empirical evidence on the relationship between capital structure and profitability in Indonesia's post-pandemic infrastructure sector. Practically, the findings offer insights for financial managers in determining optimal leverage levels, as well as guidance for policymakers and investors in formulating sustainable and efficient financing strategies for infrastructure development.

METHOD

Type and Approach of Research

A quantitative research design with a descriptive-verificative method is employed in this study to examine the effect of capital structure variables—namely the Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), and Long-Term Debt to Total Assets Ratio (LTDtA) on profitability, measured by Return on Assets (ROA), in infrastructure companies listed on the Indonesia Stock Exchange (IDX) during the period 2020-2024. The quantitative approach is chosen because it allows for the objective testing of relationships between variables through statistical analysis, thereby producing measurable and verifiable findings.

Research Object and Data Sources

The research objects consist of infrastructure sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2020 to 2024. The infrastructure sector was chosen due to its capital-intensive nature and strong reliance on long-term financing, making it highly relevant for examining the relationship between capital structure and profitability.

This study utilizes secondary data obtained from annual financial statements published on the official IDX website (www.idx.co.id), as well as company annual reports and other supporting financial publications.

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Data Analysis Technique

The data analysis was conducted through several stages as follows:

a. Data Collection

Collecting company financial data related to total assets, total equity, total debt, long-term debt, EBIT, and net income.

b. Financial Ratio Calculation

1) Debt to Asset Ratio (DAR) = Total Debt / Total Assets
2) Debt to Equity Ratio (DER) = Total Debt / Total Equity
3) Long Term Debt to Total Asset (LTDtA) = Long-Term Debt / Total
4) Assets Return on Assets (ROA) = Net Income / Total Assets

c. Classical Assumption Tests

Tests for normality, multicollinearity, heteroskedasticity, and autocorrelation were conducted to ensure that the regression model meets the requirements of the BLUE (Best Linear Unbiased Estimator).

d. Multiple Linear Regression Analysis

The analytical model used in this study is formulated as follows:

$$\boldsymbol{Y = \alpha + \beta_1 DAR + \beta_2 DER + \beta_3 LTDtA + e}$$

Where:

Y = Profitability (ROA)

DAR = Debt to Asset Ratio

DER = Debt to Equity Ratio

LTDtA = Long Term Debt to Total Asset

α = Constant

$\boldsymbol{\beta_1, \beta_2, \beta_3}$ = Regression Coefficients

e = Error term

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e. Significance Tests

The study performs both partial (t-test) and simultaneous (F-test) analyses to examine the individual and combined effects of the independent variables on profitability.

f. Interpretation and Conclusion

The results are interpreted based on statistical findings and linked to the Pecking Order Theory and Trade-Off Theory to strengthen the conceptual analysis and explain the relationship between capital structure and profitability in the infrastructure sector.

RESULTS AND DISCUSSION

Analysis Descriptive

This study utilizes panel data from 39 infrastructure sector companies listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024, totaling 195 observations. Data processing and analysis were conducted using SPSS through a multiple linear regression method to examine the effect of capital structure on company profitability.

	N	Minimum	Maximum	Mean	Std. Deviation
ROA (Y)	195	-3.3851	0.4156	-0.017810	0.2740494
LTDTA (X3)	195	0.0002	4.0837	0.247268	0.3372431
DER (X2)	195	-34.9300	10.9580	1.086802	4.1772207
DAR (X1)	195	0.0027	7.2401	0.579776	0.6347821
Valid N (listwise)	195				

Table 1. *Analysis Descriptive*

Descriptive analysis reveals that the ROA variable recorded a minimum value of -3.3851 and a maximum of 0.4156, with a mean of -0.017810 and a standard deviation of 0.2740494. The negative mean indicates that, overall, the companies' profitability tends to be low. The LTDTA variable has a minimum of 0.0002, a maximum of 4.0837, a mean of 0.247268, and a standard deviation of 0.3372431, implying that approximately 24.73% of company assets are financed by long-term debt.

The DER variable has a minimum value of -34.9300, a maximum of 10.9580, a mean of 1.086802, and a standard deviation of 4.1772207. A mean above one indicates a relatively high

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use of debt compared to equity. Meanwhile, the DAR variable shows a minimum of 0.0027, a maximum of 7.2401, a mean of 0.579776, and a standard deviation of 0.6347821, suggesting that about 57.98% of assets are financed by debt.

Overall, these results indicate considerable variation among companies in terms of profitability and capital structure within Indonesia's infrastructure sector.

Multicollinearity Test

A multicollinearity test was conducted to identify whether there are strong correlations among the independent variables in the regression model. This test was performed using SPSS software by examining the Tolerance and Variance Inflation Factor (VIF) values.

Unstandardized Coeffficients			**td. coe. Beta**	**t**	**ig.**	**Collinearity Statistics**	
	B	**l. Error**				**Tol**	**VIF**
(constant)	-.044	.027		-1.658	.099		
DAR	-.041	.047	-.094	-.860	.391	.424	2.357
DER	.004	.005	.060	.843	.400	.994	1.006
LTDTA	.185	.089	.228	2.089	.038	.425	2.354
a. Dependent Variable: ROA_Y							

Table 2: *Multicollinearity Test Results*

Based on the multicollinearity test results, Tolerance values greater than 0.10 and VIF values less than 10 indicate that the regression model does not experience multicollinearity issues. This means that the capital structure variables DAR, DER, and LTDTA do not strongly influence each other. Each variable is able to independently explain variations in profitability (ROA) without excessive intercorrelation. Therefore, the model is suitable for further regression analysis.

Heteroskedasticity Test

A heteroskedasticity test was conducted to determine whether there are differences in the residual variance between observations in the regression model. This test was performed using SPSS software with the Glejser test method.

Unstandardized Coeffficients		**td. coefficients Beta**	**t**	**Sig**
B	**Std. Error**			
(Constant)	.096	.025		3.811	.000

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DAR	.052	.044	.129	1.170	.244
DER	-.003	.004	-.043	-.604	.546
LTDTA	-.149	.083	-.197	-1.790	.075
a. Dependent Variable: abs_res_1					

Table 3: *Heteroskedasticity Test Results*

Based on the results of the heteroskedasticity test shown in the table above, the significance values for the variables DAR, DER, and LTDtA are 0.244, 0.546, and 0.075, respectively, all of which are greater than α = 0.05. This indicates that the regression model does not exhibit heteroskedasticity. Therefore, the model meets the homoskedasticity assumption and is suitable for further multiple regression analysis.

Uji F (F-Test)

The F-test was conducted to determine whether all independent variables simultaneously have a significant effect on the dependent variable. This test was performed using SPSS software with a significance level of 0.05.

	Sum of Squares	**df**	**ean Square**	**F**	**Sig**
Regression	.455	3	.152	2.053	.108[b]
Residual	14.115	191	.074		
Total	14.570	194			
a. Dependent Variable: ROA_Y b. Predictors: (Constant), LTDTA, DER, DAR					

Table 4: *F-Test Results*

Based on the F-test results presented in the previous table, the calculated F-value is 2.053 with a significance of 0.108. Since this significance value exceeds the α = 0.05 threshold, it can be concluded that, simultaneously, the variables Debt to Asset Ratio (DAR), Debt to Equity Ratio (DER), and Long-Term Debt to Total Assets (LTDtA) do not have a significant effect on the profitability (ROA) of infrastructure sector companies listed on the Indonesia Stock Exchange during the period 2020–2024.

Uji t (t-Test)

The t-test was conducted to determine the partial effect of each independent variable on the dependent variable. This test was performed using SPSS software with a significance level of 0.05.

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Unstandardized Coeffficients			td. coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig**
(Constant)	-.044	.027		-1.658	.099
DAR	-.041	.047	-.094	-.860	.391
DER	-.004	.005	.060	.843	.400
LTDTA	.185	.089	.228	2.089	.038
a. Dependent Variable: ROA_Y					

Table 5: *t-Test Results*

Based on the t-test results presented in the table above, the Debt to Asset Ratio (DAR) has a significance value of 0.391 and the Debt to Equity Ratio (DER) has a significance value of 0.400, both exceeding the 0.05 significance threshold. This indicates that DAR and DER do not have a significant effect on profitability (ROA). Meanwhile, the Long-Term Debt to Total Assets (LTDtA) variable has a significance value of 0.038 with a positive regression coefficient of 0.185, indicating a positive and significant effect on ROA. Therefore, it can be concluded that only LTDtA has a significant positive influence on the profitability of infrastructure sector companies.

CONCLUSION

This study aims to examine the extent to which capital structure affects profitability in infrastructure sector companies listed on the Indonesia Stock Exchange during the period 2020–2024. Based on the analysis results, it was found that the Debt to Asset Ratio (DAR) and Debt to Equity Ratio (DER) do not have a significant effect on Return on Assets (ROA), whereas Long-Term Debt to Total Assets (LTDtA) shows a positive and significant effect. Therefore, the first and second hypotheses are rejected, while the third hypothesis is accepted.

These findings confirm that an overall increase in debt proportion does not necessarily enhance profitability, particularly in the infrastructure sector, which carries high interest burdens. However, the proportional use of long-term debt is proven to have a positive impact on profitability as it provides tax shield benefits and supports long-term project financing. This result is consistent with the Trade-Off Theory (Kraus & Litzenberger, 1973), which explains that the optimal use of long-term debt can improve a company's financial performance.

Overall, this study strengthens the empirical evidence that proper management of capital structure, particularly in terms of long-term debt, plays a crucial role in enhancing a company's ability to generate profits. The limitations of this study lie in the relatively short observation period and its scope, which only covers a single industry sector. Therefore, future research is recommended to expand the analysis to multiple sectors and incorporate additional variables such as company size, asset growth, or operational efficiency to obtain more comprehensive results.

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