International Journal of Scientific and Management Research
Volume 8 Issue 6 (June) 2025
ISSN: 2581-6888
Page: 18-27

Capital Structure and Profitability as Determinants of Firm Value: The Moderating Role of Firm Size in Indonesia's Property and Infrastructure Sectors

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DOI - http://doi.org/10.37502/IJSMR.2025.8603

Abstract

The property and infrastructure sector has experienced a decline in firm value from 2021 to 2023, despite the fact that firm value is an essential factor for investors' consideration before making investment decisions. Firm value can be influenced by company performance, such as capital structure and profitability, as well as other factors that can moderate the influence between capital structure and profitability on firm value. This research aims to analyze the effect of capital structure, measured by Debt-to-Equity Ratio (DER), and profitability, measured by Return on Investment (ROE), on the firm value of property and real estate sectors. It also assesses the moderating role of firm size in the relationship between capital structure and profitability on firm value. This quantitative research uses the Moderated Regression Analysis (MRA) method to analyze the relationship between variables in the model. The results show that capital structure has a positive and significant effect on the firm value of the property and infrastructure sectors. Profitability also positively and significantly affects the firm value of property and infrastructure sectors. Furthermore, the firm size significantly strengthens the effect of capital structure on firm value and the impact of profitability on firm value, suggesting that larger firms may be better positioned to enhance their market valuation through improved financial performance.

Keywords: *firm value*, *DER, ROE, firm size, moderated regression analysis*

1. Introduction

Firm value is widely recognized as a critical indicator of a company's success and attractiveness to investors. In a competitive business environment, firm value not only reflects the company's current performance but also serves as a benchmark for investor perception and market confidence. According to Signalling Theory (Spence, 1973), firm value acts as a signal to the market, where higher values often indicate strong performance and lower investment risk. Consequently, companies listed on the Indonesia Stock Exchange (IDX) are particularly attentive to factors that may affect their firm value, including those in the property and infrastructure sectors.

Property and infrastructure sectors are selected for this study due to their significant contribution to Indonesia's Gross Domestic Product (GDP) and their expected role in driving economic growth. However, despite this importance, this sector has experienced a fluctuation in firm value. In 2022, a decline of 0.13% is recorded, followed by an increase of 0.04% in 2023. The relatively small growth trend suggests the presence of internal factors that may influence the firm value. Therefore, it is crucial to analyze the factors that influence the value of firms in the real estate, land, and infrastructure sectors, as well as potential moderating variables such as firm size, which is closely related to firm revenue and assets.

Firm value is influenced by many factors, including firm performance, which includes factors such as capital structure and profitability. In addition to performance, factors that can moderate the relationship between capital structure, profitability, and firm value are also important. Therefore, this research examines how capital structure and profitability affect firm value in the real estate and infrastructure industries, and whether firm size moderates these relationships.

Several empirical studies have addressed the relationship between capital structure, profitability, and firm value. A study by Astari et al. (2019) analyzed the effect of capital structure and profitability on the firm value of the real estate sector from 2014 to 2018. The results showed that capital structure harmed firm value, while profitability had a positive effect. However, firm size did not impact the relationship between capital structure, profitability, and firm value. In contrast, Wulandari et al. (2023) examined the effect of profitability, capital structure, and firm size on firm value and compared the period before and during the COVID-19 pandemic. The results showed that profitability, measured by return on equity (ROE), positively impacted firm value. In contrast, capital structure, measured by debt-to-equity ratio (DER), did not significantly impact the pre-pandemic period (2016-2019), while harming the first to third quarters of 2020, when the pandemic peaked. Yasin et al. (2023) recently analyzed the effects of profitability, leverage, and firm size on property and real estate companies listed on the Indonesia Stock Exchange (IDX). The research findings showed that profitability, leverage, and firm size together produced significant effects on these listed companies from 2017 to 2021

Given the inconsistent findings from previous studies, this research intends to examine the effects of capital structure and profitability on firm value and to assess the moderating role of firm size. By employing a quantitative approach, this research uses several variables, including Debt to Equity Ratio (DER), Return on Equity (ROE), Price to Book Value (PBV), and firm Size on the dataset of property and infrastructure firms listed on the Indonesia Stock Exchange (IDX). The method used is Moderated Regression Analysis (MRA), which combines regression and moderation testing. This method is used to examine the effect of capital structure and profitability on firm value, and whether firm size moderates the relationship between capital structure and profitability on firm value

By addressing recent developments in the Indonesian property and infrastructure sector and gaps in the literature, this research aims to investigate the impact of capital structure and profitability on firm value with firm size as a moderating variable. The research draws on data from companies in the property and infrastructure sectors from 2020 to 2024, aiming to generate relevant insights to support corporate decision-making, policymakers maker and investors in formulating their investment strategies by aligning capital structure decisions and sustainable firm value achievement

2. Research Methods

2.1 Population and Sample

The population of this research consists of companies listed in the ESG Leaders Index from 2020 to 2024 in the infrastructure and property sectors. The sample was selected using purposive sampling based on three criteria: companies from the infrastructure and property sectors listed on the Indonesia Stock Exchange (IDX), included in the ESG Leaders Index, and having complete financial report data for the 2020–2024. Based on these criteria, the final sample consists of seven companies. These companies are listed in Table 1.

Table 1. Infrastructure and Property Sector Company

No	Company Code	Company Name
1	BSDE	PT. Bumi Serpong Damai Tbk
2	TOWR	PT. Sarana Menara Nusantara Tbk
3	TLKM	PT. Telkom Indonesia (Persero) Tbk
4	TBIG	PT. Tower Bersama Infrastructure Tbk
5	PWON	PT. Pakuwon Jati Tbk
6	JSMR	PT. Jasa Marga (Persero) Tbk
7	CTRA	PT. Ciputra Development Tbk

Source: idx.co.id (2025)

2.2 Data Collection Techniques

The data consists of financial reports from property and infrastructure sector companies listed on the Indonesia Stock Exchange (IDX) that are included in the ESG Leaders Index and consistently publish their financial statements from 2020 to 2024. These reports were accessed from the official IDX website (www.idx.co.id). Additional supporting data were collected from various sources such as books, journals, theses, dissertations, and credible websites. All data were processed using the SmartPLS 4.0 application.

2.3 Data Analysis Method

The data collected in this research will be analyzed using Moderated Regression Analysis (MRA) with a Structural Equation Modeling (SEM) approach. The analysis will be performed using the SmartPLS 4.0 software. The moderated multiple linear regression equation used for hypothesis testing is shown below:

$$Y = b_1X_1 + b2X_2 + b_3M + b_4X_1M + b_5X_2M$$

Description:
Y = Firm Value
b = Regression Coefficient
X_1 = Capital Structure
X_2 = Profitability
M = firm Size
X_1M = Interaction between Capital Structure and Firm Size
X_2M = Interaction between Profitability and Firm Size

3. Results and Discussions

3.1 Results

3.1.1 Descriptive Analysis

Descriptive analysis in this research is conducted to understand and describe the variables under investigation, namely Debt to Equity Ratio (DER), Return on Equity (ROE), Price to Book Value (PBV), and Firm Size.

Table 1. Descriptive Analysis

Variabel	N	Minimum	Maximum	Mean	Std. Deviation
DER	35	0.430	4.458	1.712	1.196
ROE	35	-0.050	0.473	0.128	0.102
PBV	35	0.423	6.226	2.043	1.606
Firm Size	35	30.907	33.334	31.853	0.711

Source: Data processed (2025)

Based on the descriptive analysis in Table 2, the average Debt to Equity Ratio (DER) is 1.712, showing that most companies are financed more by equity than debt. The average Return on Equity (ROE) is 0.128, indicating the companies' profitability relative to their equity capital. The average Price to Book Value (PBV) is 2.043, reflecting the market's valuation of the companies based on their stock prices. Meanwhile, the average firm size is approximately 31.853, representing the companies' total assets, including current and non-current assets.

3.1.2 Moderated Regression Analysis (MRA)

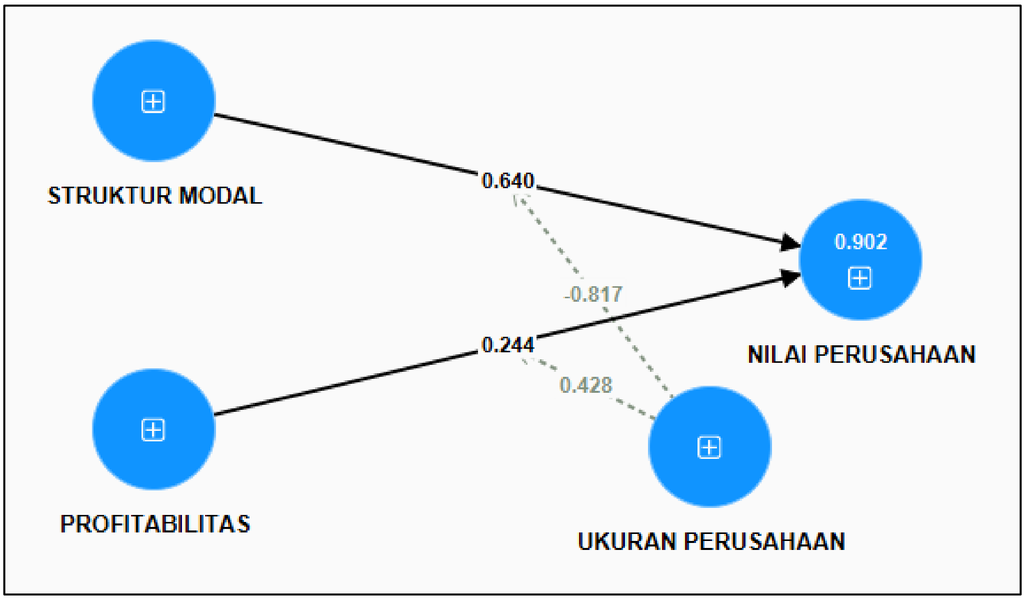

Fig. 1 Structural Model MRA
Source: Data processed by SmartPLS 4.0 (2025)

The structural model test using Moderated Regression Analysis (MRA) shows that capital structure (DER) and profitability (ROE) both have a positive impact on firm value, with coefficients of 0.640 and 0.244, respectively. This result shows that firm value increases as capital structure and profitability increase. Firm Size, acting as a moderator, weakens the effect of capital structure on firm value with a coefficient of 0.817. Still, it strengthens the impact of profitability on firm value with a coefficient of 0.428.

3.1.3Hypothesis Test

Table 2. Hypothesis test

	Hypothesis	Original Sample	t Statistics	p-values	Description
H1	Capital Structure → Firm Value	0.640	4.042	0.000	Accepted
H2	Profitability → Firm Value	0.244	2.084	0.040	Accepted
H3	Capital Structure * Firm size → Firm Value	-0.817	4.663	0.000	Accepted
H4	Profitability * Firm size → Firm Value	0.428	2.821	0.006	Accepted

Source: Data processed by SmartPLS 4.0 (2025)

The results of the hypothesis testing show that all four hypotheses (H1–H4) are supported by the data. The first hypothesis (H1) shows that capital structure positively and significantly affects firm value, with a t-statistic of 4.042 and a p-value less than 0.05. The second hypothesis (H2) also confirms that profitability positively and significantly affects firm value, with a t-statistic of 2.084 and a p-value less than 0.05. For the third hypothesis (H3), firm size significantly and negatively moderates the effect of capital structure on firm value, with a t-statistic of 4.663 and a p-value less than 0.05, meaning that it weakens the effect. In contrast, the fourth hypothesis (H4) shows that firm size significantly and positively moderates the effect of profitability on firm value, with a t-statistic of 2.821 and a p-value less than 0.05, meaning this moderation effect is statistically significant.

3.1.4 Equation Moderated Regression Analysis

Based on the results of the hypothesis testing, the regression equation developed is as follows:

$$Y = 0{,}640X_1 + 0{,}244X_2 – 0{,}670M – 0{,}817X_1M + 0{,}428X_2M$$

Description:
Y = Firm Value
b = Regression coefficient
X_1 = Capital Structure Variable
X_2 = Profitability Variable
M = Firm Size Variable
X_1M = Interaction between Capital Structure and Firm Size
X_2M = Interaction between Profitability and Firm Size

The MRA model results indicate that capital structure and profitability positively and significantly affect firm value, with coefficients of 0.640 and 0.244, respectively. Meanwhile, Firm Size has a direct adverse impact on firm value, with a coefficient of -0.670. As a moderating variable, firm Size weakens the effect of capital structure on firm value, with a moderating coefficient of -0.817. On the other hand, firm Size strengthens the positive impact of profitability on firm value, with a coefficient of 0.428. Overall, this suggests that firm Size significantly influences how strongly the independent variables affect firm value.

3.1.5 Model Suitability Criteria

Table 4. Model Sutability Criteria

Criteria	R Square	R-Square Adjusted	Description
R Square	0.902	0.885	High
	Saturated Model	Estimated Model	Description
SRMR	0.000	0.044	Accepted
NFI	1.000	0.944	Accepted

Source: Data processed by SmartPLS 4.0 (2025)

The analysis shows an R-Square of 0.902 and an Adjusted R-Square of 0.885, meaning that around 88.5% to 90.2% of the variation in firm value is explained by the independent variables in the model. This result indicates a strong relationship. Factors outside the model influence the remaining 9.8% to 11.5%. As for model fit, the SRMR value is 0.044, below the 0.08 threshold, suggesting that the difference between observed and predicted correlations is slight and the model is acceptable. The NFI value is 0.944, above the minimum standard of 0.90, confirming the model's validity. The moderated regression model is considered a good fit and acceptable based on these three model fit indicators.

3.2 Discussions

3.2.1 The Effect of Capital Structure on Firm Value

The results show that capital structure, measured by the Debt to Equity Ratio (DER), positively and significantly impacts firm value. This condition means the firm's value increases as the capital structure increases. In this research, adding debt positively affects firm value because taking on more debt improves the capital structure, making the company more attractive to investors. Investors tend to buy more shares when they see the company expanding using debt financing efficiently.

However, even though increasing debt can boost capital structure, any debt reduction must be smaller than the decrease in company resources. In simple terms, the company must manage its assets well. Proper debt management leads to effective repayment, helping maintain the positive link between higher debt and firm value.

These results align with Fahri et al. (2022), who found that capital structure positively and significantly affects the firm value of property and real estate companies listed on the Indonesia Stock Exchange. Pasaribu et al. (2019) also found similar results, showing that capital structure measured by Debt to Equity Ratio (DER) positively and significantly affects firm value, meaning that increasing debt raises firm value. Other research Siahaan & Putra. (2024) confirming a positive and significant impact of DER on firm value, indicating that a better capital structure boosts firm value.

This research's results contrast with those of Astari et al. (2019), who found that capital structure, measured by DER, has a negative and insignificant effect on firm value. Hastuti and Carolina (2022) also found no positive or significant impact of capital structure on firm value, with a probability value above 0.05.

3.2.2 The Effect of Profitability on Firm Value

The results show that profitability, measured by Return on Equity (ROE), positively and significantly affects firm value. In other words, when profitability increases, so does the overall firm value. When a company invests capital effectively to generate profits, it signals good profitability, which builds investor trust and boosts its value. Good debt management also increases profitability, as efficient use of funds raises earnings. By reducing equity financing and increasing debt financing, companies can maximize ROE. However, managing debt well is key to achieving maximum profit. Healthy debt financing improves fund turnover, boosts profitability, and raises firm value.

The results of this research correlate with those of Herlinawati et al. (2024), who found a statistically significant relationship between business valuation and profitability. Similarly, Janah & Munandar (2022). supports this, showing that higher profitability increases the likelihood of investor interest, thereby raising the company's market value.

This research's results contrast with those of Ningsih et al. (2022), who discovered no discernible relationship between business value and profitability as determined by Return on Assets (ROA). Similarly, Savitri et al. (2021) found that capital structure is not considerably impacted by profitability, meaning that a company's worth is not affected by the size of its profits.

3.2.3 Firm Size Moderates the Effect of Capital Structure on Company

Firm Size reflects the total assets a company holds. When assets increase, it tends to attract more investor interest. The interaction between firm size and capital structure shows that firm Size can moderate the effect of capital structure on firm value. Still, the negative coefficient means that larger firms weaken this effect. Although a higher capital structure generally boosts firm value, a large firm relying heavily on debt can raise investor concerns and cause hesitation. Smaller firms often demonstrate a better ability to manage assets to cover current debts, offering room to improve financial performance through future debt. Strong management can attract investors, so the smaller the firm, the stronger the positive impact of capital structure on firm value.

The results of this research are consistent with Herlinawati et al. (2024), who found that firm size negatively moderates the relationship between capital structure and firm value, indicating a weakening effect. Amelia et al. (2024) also confirmed that firm size acts as a moderator, but with an adverse interaction effect, meaning it reduces the influence of capital structure on firm value.

In contrast, Santoso and Susilowati (2019) found that firm size positively moderates the relationship, strengthening the impact of capital structure on firm value. Similarly, Fahri, Sumarlin, and Jannah (2022) reported that firm size enhances the effect of capital structure on firm value in property and real estate firms listed on the Indonesia Stock Exchange

3.2.4 Firm Size Moderates the Effect of Profitability on Company

Profitability shows how well a company can make money with all of its capital. The more profitable a company is, the more valuable it is. Firm Size is another factor that can make the effect of profitability on firm value stronger. Based on the analysis, firm size considerably moderates (increases) the impact of profitability on firm value, with the interaction between firm Size and profitability having a p-value of 0.000.

This research agrees with Herlinawati et al. (2024), who found that firm Size positively moderates the effect of profitability on firm value, meaning bigger firms strengthen this relationship. Other research supports this finding, showing that investors trust larger companies, especially in property and real estate, since they usually manage assets well and generate better profits (Pingkan & Pertiwi, 2022).

This research contrasts with Aisyah and Sartika (2022), who argued that firm size isn't a good moderator because bigger size doesn't always mean better use of assets to boost profits. Prabawa (2023) also found that firm size doesn't change how profitability affects firm value, as size alone doesn't determine a company's earnings.

5. Conclusion

Based on the analysis of the effect of capital structure and profitability on firm value, with firm size as a moderating variable, the following conclusions can be made:

1. Capital structure, measured by Debt to Equity Ratio or DER, and profitability, measured by Return on Equity or ROE, positively and significantly impact firm value. This indicates that higher DER and ROE lead to a higher firm value.
2. Firm size weakens the relationship between capital structure and firm value, acting as a negative moderator.
3. On the other hand, firm size strengthens the effect of profitability on firm value, meaning that larger firms are more effective in turning profitability into higher firm value.

6. Limitations and Suggestions

This research has several limitations that should be considered when interpreting its results. First, the scope of the study is limited to companies in the infrastructure and property sectors listed on the ESG Leader Index of the Indonesia Stock Exchange (BEI), which means that these findings cannot be generalized to other industries. Second, the research only covers the period from 2020 to 2024. Thus, its relevance is confined to a five-year timeframe. Third, the measurement of capital structure relies solely on the debt-to-equity ratio (DER), and profitability is assessed using Return on Equity (ROE). Alternative indicators, such as the Debt to Asset Ratio (DAR) or Return on Assets (ROA), could yield different findings.

Recommendations for companies in the infrastructure and property sectors listed on the ESG Leader Index include optimizing their capital structure through debt-based financing and maximizing the use of internal capital to generate profits. Companies with a sound capital structure but a smaller size should also focus on more effective asset management to drive future value enhancement. Furthermore, profitability, as measured by ROE, and company size, assessed by total assets, should be continuously improved, as both factors have been shown to enhance company value. Overall, improving capital structure and profitability is crucial, as it can send positive signals to investors regarding company performance and increase their confidence in investing.

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