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Does Tax Saving Moderate the Effect of Capital Structure on Firm Performance? An Empirical Research of Indonesian Construction Firms

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Abstract

Objective: This study aimed to empirically examine the impact of capital structure and the moderating effect of tax savings on firm performance of Indonesian SOEs and public construction firms.
Design/Methods/Approach: Using the fixed effect robust standard error, this study analyzed the effect of capital structure and moderating role of tax saving on performance of 104 observations during the period of 2010-2022. Firm's performance is measured by technical efficiency using data envelopment analysis (DEA), ROA, and ROE. Meanwhile, capital structure was measured by debt ratio.
Findings: The result shows that there are stark differences between the effect of capital structure on firm performance between SOEs and public firms. It is found that capital structure negatively affects firm performance of SOEs, while there is an insignificant positive impact on a public firm's ROA and ROE. The study supports the trade-off theory, emphasizing the importance of optimal leverage level in Indonesian construction firms.
Originality/Value: This study examines the moderating impact of tax saving on capital structure and firm performance, providing evidence on how capital structure influence tax saving and eventually affect firm's performance of Indonesian construction firms.
Practical/Policy implication: The findings suggest managers should consider the benefit of tax saving when making decisions of capital structure. At the same time, policymakers should make laws about tax that maintain business continuity.

Keywords: Capital structure, Firm performance, Profitability, Efficiency

JEL Classification: G32, L25

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1. Introduction

Decisions related to financing are complex matters for firm managers. If financing is done using an inappropriate debt and equity structure, it will have negative impacts on performance and even the sustainability of the company. Therefore, in order to maximize the company's value, managers need to carefully consider decisions regarding capital structure (Siddik et al., 2017).

The infrastructure sector has its own unique characteristics. This industry has a very high business failure rate and is highly sensitive to the political conditions of a country. In addition, the infrastructure sector is also highly vulnerable to changes in the business and economic environment. During economic recession, the infrastructure sector is the first to be affected and the last to recover when economic conditions begin to improve (Rus & Samiran, 2012). Furthermore, the construction sector is known as a capital-intensive industry that requires substantial capital investment, business cycles are longer, and returns are realized over a long period of time compared to other sectors (Khan, 2012).

The Covid-19 pandemic that hit Indonesia in 2020 had an impact on the domestic construction sector. The budget of the Ministry of Public Works and Public Housing (Kementerian PUPR) experienced a decrease compared to previous years due to the allocation of the state budget for handling the pandemic. Furthermore, the Covid-19 pandemic also led to a significant increase in the amount of debt held by companies in the construction sector. According to research conducted by Satria et al. (2021), the financial performance of construction sector state-owned enterprises (SOEs) in 2020 experienced a decline compared to the previous year. Total debt to assets increased with a rising to 77.51% compared to the previous years of 74.76%. The obstruction of construction activities due to large-scale social restrictions (PSBB) also resulted in a decrease in company revenue by 34.59% compared to 2019.

The increase of debt value in construction SOEs was largely caused by Government Regulation No. 23/2020 regarding the National Economic Recovery Program for Covid-19 Pandemic. By this regulation, the government had developed various policy schemes to rescue SOEs. These schemes include: 1) maintaining financial liquidity and solvency through state capital injections (PMN), 2) disbursement of government debt, and 3) government loans. Additionally, the government has prioritized support for several sectors for SOEs including the infrastructure sectors. Since, infrastructure development facilitates structural reforms and economic transformation, it plays a crucial role in stimulating economic growth (Muhyiddin & Nugroho, 2021).

Moreover, Indonesian construction SOEs have the goal of assisting government in increasing the welfare of the country by developing infrastructure. This caused a dilemma in optimizing their capital structure to finance their operations due to mandatory assignments given by the government. The high costs of infrastructure projects that are not fully supported by the government compel them to seek additional sources of funding, including loans. The optimal use of debt can have negative consequences for the company as bankruptcy costs increase with the use of loans (Kim, 1978).

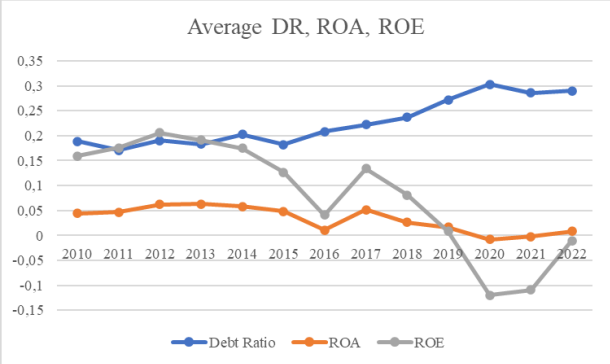

Figure I. Average of Debt and Profitability of Indonesian Construction Firms 2010-2022

Based on Figure I, the average construction sector firms in Indonesia experienced an increase in debt ratios from 2010 to 2022. This indicates that the majority of company assets were funded through loans. However, the average of company performance as measured using ROA and ROE had decreased from 2010-2022. A high debt ratio indicates significant leverage costs, potentially resulting in a negative correlation between leverage and firm performance. Myers (1977) argued that debt overhang issues lead to underinvestment and poor firm performance. Additionally, firms with substantial leverage face a higher average risk of bankruptcy (Altman, 1984).

Many studies in the area have been conducted on this topic including Abdullah and Tursoy (2019) who studied the impact of capital structure on firm performance and found that there is a significant positive correlation between a firm's capital structure and its performance measured using ROA and ROE. Another study conducted by Le and Phan (2017) found a negative relationship between capital structure and company performance measured by ROA and ROE. Ignoring bankruptcy or restructuring costs can cause companies to have more debt than its appropriate level. Furthermore, a study conducted by Tsolas (2011) analyzed the relationship between company efficiency and profitability

levels. The results indicated a clear relationship between operational (cost-oriented) and financial (profit-oriented) performance. Margaritis and Psillaki (2007) stated there is a relationship between capital structure and company efficiency. Meanwhile, on the moderating role of tax saving on firm performance, Lazăr and Istrate (2018) found that effective tax rate has a negative impact on firm performance measured by ROA. Further study by Tackie et al. (2022) discovered that tax saving has a negative impact on firm performance on Ghana insurance companies, while Vartia (2008), stated that tax savings have a positive impact on company efficiency because high tax payments can cause bias in the allocation of company resources, affect company funding incentives through expectations of after-tax profits, and can hinder R&D investment.

The problems and challenges post the Covid-19 pandemic faced by the Indonesian construction sector, as well as inconsistencies in previous research, necessitate further research on the impact of capital structure on the performance of construction firms in Indonesia. The current study differs from previous studies in several aspects. First, this study enhances the capital structure literature by considering the moderating role of tax savings on firm performance. Second, this study compares the impact of capital structure on firm's performance between SOEs and publicly-owned companies to provide an overview of the differences in debt usage characteristics between these two types of companies. Third, this research used a non-parametric measure of firm efficiency using data envelopment analysis which can fairly compare the performance of SOEs and public firms. Finally, this study offers empirical evidence for firm managers to evaluate the debt proportion in the company's capital structure by considering the role of tax savings on firm performance.

Therefore, the main objective of this research is to investigate how the capital structure of Indonesian construction companies influences their performance, while also examining the moderating effect of tax savings on this relationship. Particularly, this research attempts to address three objectives: 1) to describe the nature of the relationship between capital structure and firm performance; 2) to examine the impact of Covid-19 on the relationship between capital structure and firm performance on Indonesian construction SOE and public firms; and 3) to analyze the moderating effect of tax saving on the relationship between capital structure and firm performance.

The remaining section of this research is organized as follows. Section 2 explains the literature review and hypothesis development including previous research. Section 3 defines the data and methodology used. Section 4 describes the empirical results and discussion. Section 5 analyzes the results and Section 6 shows conclusion and recommendations for future research.

2. Literature Review and Hypotheses Development

The initial theory to explain the relationship of capital structure and firm value is the MM theory. Modigliani and Miller (1958) stated that capital structure has no significant impact on firm value. This claims that any combination between debt and equity would be irrelevant to firm value. The theory is based under the assumption that capital market is perfect and there are no taxes, bankruptcy, and transaction cost. Moreover, there is no asymmetric information, borrowing costs are identical, all managers desire to maximize value, and level of risk is consistent for firms operating with similar condition.

Later, Modigliani and Miller (1963) proposed that companies can increase their value by adding debt to the capital structure and utilizing tax shield. However, using debt as the sole source of company financing is not feasible. According to Myers (1984), the tax benefits from increase of debt are equal to the costs arising from financial distress. These costs include bankruptcy costs and agency costs that arise due to the decreased credibility of the company resulting from increased debt in the capital structure.

Additionally, according to Brigham and Houston (2004), the optimal capital structure of a company is achieved when the company's value increases and the cost of capital decreases. This is determined by the trade-off when using debt, which involves tax savings versus agency costs. The trade-off theory suggests that firms can reach an optimal capital structure that maximizes their value by issuing debt, primarily due to the tax advantages associated with debt. According to this theory, firms weigh the costs and benefits of debt to enhance their value (Kraus & Litzenberger, 1973; Myers, 1984). The advantage of incorporating debt continues until the optimal capital structure is achieved (Al-Kahtani & Al-Eraij, 2018). The initial benefit of debt is the tax shield (Modigliani & Miller, 1963), which allows firms to reduce their taxable income through interest deductions. Another theory of capital structure, known as the pecking order theory, argues that there is no single optimal capital structure, so companies should focus more on using internal sources of funds rather than relying on external financing.

The tax benefit resulting from the payment of interest expenses on corporate debt can reduce financing costs through debt compared to other financing alternatives (Badarau-Semenescu & Semenescu, 2010). Furthermore, companies with higher effective tax rates are likely to experience lower performance because the taxes paid negatively affect corporate earnings (Wang et al., 2014). Financing decisions become an important consideration due to the tax savings derived from corporate debt and their impact on firm value (Fernández-Rodríguez & Martínez-Arias, 2012).

Firm performance is the result of operational activities carried out by the company within a certain period of time which aims to evaluate its efficiency and effectiveness. Al-Matari et al. (2014) stated that financial performance can

be used as a metric for assessing firm performance. Generally, there are two ratios to measure company performance through financial performance, namely return on assets (ROA) and return on equity (ROE). ROA is calculated by dividing the company's net profit and total assets (Margaritis & Psillaki, 2010). Meanwhile, ROE is a ratio calculated by dividing the company's net profit by total equity (Le & Phan, 2017). ROA, an accounting-based metric, evaluates a firm's operational and financial performance (Al-Matari et al., 2014). A higher ROA indicates the company's efficient utilization of its assets to benefit its shareholders economically (Ibrahim & AbdulSamad, 2011). Meanwhile, an increasing ROE means that the return value received by shareholders can be maximized.

Al-Matari, et al. (2014) also stated that firm performance that particularly related to the production process is measured by technical efficiency. Coelli et al. (2005) stated that efficiency can be measured through two approaches, namely output-oriented and input-oriented approaches. An output-oriented approach refers to a company's efforts to maximize its profits by increasing the proportion of output without increasing the level of input. On the other hand, an input-oriented approach involves the company's efforts to reduce the proportion of input levels to achieve output at the same level. In this approach, an entity tries to minimize production costs by reducing its input costs. Farrell (1957 cited in Coelli et al., 2005: 51) states that company efficiency is divided into two aspects: technical efficiency, which assesses the company's ability to achieve maximum results from the inputs used, and allocative efficiency, which evaluates the company's ability to use inputs in the most optimal way. These two measurements are then combined to assess overall economic efficiency.

Many studies in the area have been conducted on this topic including Abdullah and Tursoy (2021) who studied the impact of capital structure on firm performance under IFRS adoption in Germany and found that there is a significant positive correlation between a firm's capital structure and its performance measured using ROA and ROE. Another study conducted by Le and Phan (2017) found a negative relationship between capital structure and company performance measured by ROA and ROE. Ignoring bankruptcy or restructuring costs can cause companies to have more debt than is appropriate level. Furthermore, a study conducted by Tsolas (2011) analyzed the relationship between company efficiency and profitability levels. The results indicated a clear relationship between operational (cost-oriented) and financial (profit-oriented) performance. Another study by Margaritis and Psillaki (2010) stated a relationship between capital structure and company efficiency. Based on these references, the first hypothesis is:

H1: Capital structure impacts firm performance

In the latest MM theory, Modigliani and Miller (1963) explain that companies can optimize their capital structure to enhance firm value through tax savings. This theory suggests that the use of debt entails both benefits and costs in order to increase the value of the company (Kraus & Litzenberger, 1973; Myers, 1984). The benefits arise from the reduction of tax costs caused by interest payments. Lazăr and Istrate (2018) indicate that the effective tax rate (ETR) negatively impacts company performance measured by ROA. This suggests that, although the corporate income tax rate is lower in Romania, the overall tax mix has a detrimental effect on performance. Another study by Tackie et al. (2022) found that a high ETR is positively associated with company performance (measured by ROA or ROE) in insurance companies. However, this study also reveals that, at some point, a high ETR may indicate a company's failure to plan taxes effectively, thus resulting in a negative relationship between ETR and company performance. Furthermore, Gkikopoulos et al. (2021) argue that companies with lower ETRs achieve higher productivity efficiency. This suggests that a lower ETR can enhance a company's access to external funding and productive investments. Based on these references, the second hypothesis is:

H2: Tax saving moderates the impact of capital structure on firm performance

3. Methodology

The secondary data were collected using a purposive sampling method with the following criteria:

1. Construction companies that report their financial reports to the IDX in the 2010-2022 period.
2. Indonesian construction SOEs that published financial reports on the company's website for the 2010-2022 period.
3. Companies that included in the classification of construction sector based on Jakarta Stock Industrial Classification (JASICA) Index.
4. Construction companies that have complete data and consecutive in their financial reports and annual reports.

The sample chosen consists of nine construction firms with five SOEs and four public firms for a thirteen-year period from 2010 to 2022. The thirteen-year period was selected to examine the long-term effects of capital structure on firm performance post-global financial crisis up to the financial crisis caused by the Covid-19 pandemic. The Covid-19 pandemic has had its own impact on the construction sector with social distancing regulations disrupting firm operational activities. Additionally, there is a phenomenon of increased debt levels in construction sector companies caused by the financial crisis resulting from the pandemic, as companies strive to maintain cash flow for operational activities.

The data are obtained from the firm's annual reports gathered from the Indonesia Stock Exchange (IDX) and official firm websites (See Table I below).

Table I. Listed of Indonesian Construction Firms

No	Firm Name	Category
1	PT Adhi Karya (Persero)	SOE
2	PT PP (Persero)	SOE
3	PT Wijaya Karya (Persero)	SOE
4	PT Waskita Karya (Persero)	SOE
5	Perum Perumnas	SOE
6	PT Nusa Konstruksi Enjiniring Tbk	Public firm
7	PT Jaya Konstruksi Manggala Pratama Tbk	Public firm
8	PT Surya Semesta Internusa Tbk	Public firm
9	PT Total Bangun Persada Tbk	Public firm

The sample selection in Table I is based on the following considerations:

1. The construction sector is very vulnerable to changes in the macro and micro environment. The Covid-19 pandemic has its own impact on the construction sector with the existence of social restriction regulations which have disrupted the company's operational activities. Furthermore, there is an occurance of increasing debt levels in construction sector companies caused by the financial crisis due to the pandemic on account of the company's effort to maintain cash flow for operational activities.
2. The government assistance through Regulation No. 23/2020 on the Implementation of the National Economic Recovery Program, which is provided to state-owned enterprises, makes SOEs the sample of the research with the aim of comparing their capital structure and performance with public listed firms.
3. The research sample was selected based on the JASICA construction classification to focus on companies whose core business operates in construction activities (excluding telecommunications, transportation, real estate, etc.).
4. The research period is from 2010 to 2022 to observe the long-term impact of capital structure on firm performance from the post-global financial crisis up to the financial crisis caused by the Covid-19 pandemic.

Table 2 presents variables used in this study along with their measures and references. This study consists of one independent variable, three dependent variables, one moderating variable, and three control variables.

Table 2. Operational Definitions

Variable	Type	Description	Measure	Reference
Debt Ratio	Independent	Capital Structure	$\frac{Total\ Debt}{Total\ Asset}$	- Abdullah and Tursoy (2021) - Nguyen and Nguyen (2020) - Siddik et al. (2017)
ROA	Dependent	Firm Performance	$\frac{Net\ Income}{Total\ Asset}$	- Abdullah and Tursoy (2021) - Nguyen and Nguyen (2020) - Siddik et al. (2017) - Le and Phan (2017)
ROE	Dependent	Firm Performance	$\frac{Net\ Income}{Total\ Equity}$	- Abdullah and Tursoy (2021) - Nguyen and Nguyen (2020) - Siddik et al. (2017) - Le and Phan (2017)
Efficiency	Dependent	Firm Performance	Technical efficiency using DEA. Input Variables: - Number of employees - Total Assets	- Park et al. (2015) - Tsolas (2011) - Horta et al. (2010) - Chau et al. (2005)

Variable	Type	Description	Measure	Reference
			- Operational expense Output Variables: Total revenue	- Chau and Wang (2003)
Effective Tax Rate	Moderating	Tax Saving	$\frac{Tax\ Expense}{Earning\ Before\ Tax}$	Michalkova et al. (2021)
Size	Control	Firm Size	Ln(Total Asset)	Abdullah and Tursoy (2021)
BI Rate	Control	Interest Rate	BI Repo Rate	Mnang'at et al. (2016)
Covid-19	Control	Covid-19	*Dummy* Covid-19 period = 1 Before Covid-19 = 0	Satria et al. (2021)

The Fixed Effect Model (FEM) is determined based on the following reasoning by Gujarati (2012; 650):

1. The number of time-series (t) is greater than the number of cross-section units (i); and
2. The cross-section sample is not randomly selected.

Other tests were conducted and show that there is no multicollinearity among the independent variables, but there are heteroscedasticity problems. To address this issue, a robust standard error regression model will be used. Eviews 12 software was utilized to conduct the analysis and the regression models were as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 IR_{t-1} + \beta_4 COV_t + \varepsilon_{i,t} \quad (1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 IR_{t-1} + \beta_4 COV_t + \varepsilon_{i,t} \quad (2)$$

$$EFF_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 IR_{t-1} + \beta_4 COV_t + \varepsilon_{i,t} \quad (3)$$

While the regression model for ETR as moderating variable are as below:

$$ROA_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 ETR_{i,t-1} + \beta_3 ETR_{i,t-1} * DEB_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 IR_{t-1} + \beta_6 COV_t + \varepsilon_{i,t} \quad (4)$$

$$ROE_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 ETR_{i,t-1} + \beta_3 ETR_{i,t-1} * DEB_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 IR_{t-1} + \beta_6 COV_t + \varepsilon_{i,t} \quad (5)$$

$$EFF_{i,t} = \beta_0 + \beta_1 DEB_{i,t-1} + \beta_2 ETR_{i,t-1} + \beta_3 ETR_{i,t-1} * DEB_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 IR_{t-1} + \beta_6 COV_t + \varepsilon_{i,t} \quad (6)$$

ROA, ROE, and efficiency were the proxies for firm performance, representing return on asset, return on equity, and technical efficiency. Previous research (Abdullah & Tursoy, 2021; Le Phan, 2017; Nguyen & Nguyen. 2020); Siddik et al. 2017) used ROA and ROE as measures of performance. Additionally, firm performance can also be measured through technical efficiency using the data envelopment analysis (DEA) method, which compares the total output of goods and services produced to the total input used (Coelli et al., 2005).

4. Results and Discussion

4.1. Descriptive Statistics

Table 3 exhibits descriptive statistics of the data used in this study. The key figures are the mean, standard deviation, minimum, and maximum values.

Table 3. Descriptive Statistics Result

	ROA	ROE	EFF	DEB	ETR	SIZE	IR
Mean	0.0352	0.1198	0.8434	0.1807	0.2483	8.834	0.0587
Maximum	0.1284	0.3217	1	0.6188	0.8074	1.173	0.0775
Minimum	-0.0246	-0.1825	0.3	0	-0.0943	6.919	0.035
Std. Dev.	0.0264	0.0889	0.2179	0.1138	0.1913	1.210	0.0134
Observations	104	104	104	104	104	104	104

The average ROA in Indonesian construction firms is 0.0352, indicating that the sampled firms earned a return of 3.52% of total assets with the highest value of 12.84% from PT Surya Semesta Internusa Tbk in 2013 and the lowest value of -2.46% from PT Surya Semesta Internusa Tbk in 2021. The average ROE in Indonesian construction firms is 0.1198, depicting the efficiency of companies in utilizing their equity to create net profit on average is 11.98%. Maximum value of 32.17% from PT Surya Semesta Internusa Tbk in 2013 and the minimum value of -18.25% from PT Waskita Karya in 2021. The average efficiency of Indonesian construction firms is 0.8434 or 84.24%, indicating a good level of efficiency as it approaches the value of 1 (Coelli et al., 2005).

The independent variable in this study is capital structure which is measured using the debt ratio. The average debt ratio value is 0.1807 or 18.07% describes the average level of debt use by sampled firms to finance the assets they own. The highest debt ratio value was 61.88% from PT Waskita Karya in 2021 and the lowest value was from PT Total Bangun Persada in 2010, 2011, 2015, 2019, and 2020. The higher the debt ratio of a company, the higher the risk the company has. Opler and Titman (1994) showed that highly leveraged firms, which are more prone to financial distress, experience declines in sales and operating income during industry downturns.

The moderating variable in this study is tax savings, measured using the effective tax rate (ETR). The average ETR value is 0.2483 or 24.83%, indicating the effectiveness of companies in managing tax burdens. The lower the ETR, the better the management in carrying out its performance (Siew Yee et al., 2018). Additionally, this study employed several control variables. Firstly, the company size measured using the natural logarithm of total assets has an average value of 8.834, indicating that the average Indonesian construction company has total assets worth Rp17,654.6 billion. Secondly, the interest rate level was measured by the BI Repo Rate. The average interest rate for the period 2010-2022 is 0.0587 or 5.87%.

4.2 Regression Result

This study applies fixed effect robust standard error regression model with the assistance of E-Views 12 application and using the samples explained in Table 1. Results of the regression models are shown in the table below:

Table 4. Panel Data Regression Result

Model	**Public Firms**			**SOE**		
	ROA (1)					
	Coefficient		Prob.	Coefficient		Prob.
DEB	0.103477		0.5111	-0.073117	*	0.0014
SIZE	-0.027878	***	0.0700	-0.000879		0.7079
IR	-0.019666		0.9509	-0.060789		0.6741
COV	-0.035272	**	0.0011	-0.020621	*	0.0000
Constanta	0.262711		0.0412	0.061067		0.0338
R-Squared	0.665094			0.825878		
F-Statistic	11.06435	*	0.000000	28.45860	*	0.000000
	ROE (2)					
	Coefficient		Prob.	Coefficient		Prob.
DEB	0.341271		0.3642	-0.335997	**	0.0434
SIZE	-0.088132	**	0.0324	-0.019074		0.1349
IR	0.021936		0.9767	-1.112483		0.1682
COV	-0.086315	*	0.0009	-0.105288	*	0.0000
Constanta	0.791220		0.0190	0.472529		0.0032
R-Squared	0.750992			0.697020		
F-Statistic	16.80306	*	0.000000	13.80330	*	0.000000
	EFF (3)					
	Coefficient		Prob.	Coefficient		Prob.
DEB	-0.392804		0.6507	-0.504423		0.2212
SIZE	0.143571	**	0.0232	0.053967		0.1497
IR	1.418468		0.6234	-0.061454		0.9658
COV	-0.026105		0.7665	0.047317		0.3121
Constanta	-0.378581		0.4274	0.480850		0.1549
R-Squared	0.591564			0.753439		
F-Statistic	8.069465	*	0.000005	18.33472	*	0.000000

* level of significance α = 1%
** level of significance α = 5%
*** level of significance α = 10%

Table 4 shows the difference effect of capital structure on the performance of state-owned and publicly-listed Indonesian construction firms. The SOEs' capital structure measured by debt ratio on SOEs has a consistentently negative effect on all of the dependent variables (ROA, ROE, and efficiency), while, it has a positive impact on ROA and ROE yet negative effect to efficiency on public firms. These results are in line with previous research conducted by Nguyen and Nguyen (2020) which found that the negative influence between capital structure on firm performance was greater in SOEs than in public firms. Table 3 shows that the average debt ratio of Indonesian construction companies has increased during the Covid-19 pandemic which led to higher interest expense and in turn reduced company's performance. Higher debt ratio suggests a more risky funding structure and increases the likelihood of insolvency and bankruptcy (Nguyen & Nguyen, 2020). The negative influence of capital structure on efficiency caused by debt payments can cause managers to act discretionarily. Furthermore, payment of interest expense due to funding through debt can reduce the availability of cashflow for more profitable investments (Stulz, 1990). The conditions in Indonesian construction companies state that capital structure has a greater negative effect on performance in state-owned compared to publicly-listed companies.

The insignificant influence of capital structure on ROA, ROE and efficiency of public firms indicate that the funding is mostly not through debt. Public firms have an average debt ratio of 11.75%, while the average debt ratio for Indonesian state-owned construction firms is 23.29%. The total debt ratio of SOEs is almost twice as high as the publicly-listed Indonesian construction companies. Moreover, this difference is caused due to the mandatory assignments for SOEs by the government, which creates a dilemma in optimizing the capital structure to finance their operations. SOEs have an obligation for infrastructure development and must complete the tasks assigned by the government. Despite some government support, high infrastructure project costs compel SOEs to seek additional financing, often through debt. The use of debt that has reached the optimal point will have a negative impact on the company as bankruptcy costs increase due to the use of debts (Kim, 1978).

The effect of capital structure on firm's efficiency shows that there is a negative influence on state-owned and publicly-listed companies at an insignificant level. Rimaz and Ayanoglu (2021) stated that after a company utilizes external funding to the optimal point, capital structure will have a negative effect on efficiency. This indicates that increasing debt ratio also increases the expected return by shareholders (risk increases) and as a result the required rate of return by shareholders will rise. The decreasing efficiency of Indonesian construction companies along with increasing debt proves agency cost theory. If external funding costs are higher than internal funding, this will cause inappropriate allocation of funds to finance production inputs.

The control variables that also affect firm performance at a significant level are firm size (SIZE) and the Covid-19 pandemic (COV). Firm size and the Covid-19 pandemic have a negative effect on firm performance. This is in line with research by Majumdar (1997) which states that larger companies may struggle to adapt to the dynamic changes in the market. As a result, smaller companies might achieve better firm performance. Furthermore, The Covid-19 pandemic negatively affected Indonesia's SOEs firm performance. Those in tourism, logistics, and infrastructure sectors were particularly impacted (Asian Development Bank, 2022).

Table 5 present results on the effect of tax savings on firm's performance and the role of tax savings on the relation between capital structure and firm performance. Tax savings have a negative effect on ROA, ROE and efficiency in public firms but a significant effect only on firm's efficiency. Meanwhile, in state-owned companies, the influence of tax savings on company performance is negative for ROA and ROE and positive on efficiency. However, the effect of tax savings on their performance is not significant. This shows that taxes in public companies does not provide benefits to their efficiency. This finding is in line with Glover and Levine (2024) who revealed that low ETR will increase industrial concentration, which ultimately increases product prices. Incumbent firms in an industry will invest in factors of production to reduce the cost per unit of product. However, due to decreasing returns to scale, this investment becomes inefficient and the company's efficiency decreases.

Examining the role of tax saving due to the use of debt, the results show a significant positive influence on efficiency in Indonesian public construction companies. However, the influence is insignificant on the efficiency of Indonesian state-owned construction companies. The finding indicates that the use of debt as a source of funding can provide benefits through tax savings for Indonesian public construction companies. As Modigliani and Miller (1963) stated, the use of debt as a capital structure provides companies with advantages through tax savings. Taxes also have an influence on company resource allocation decisions and expected return on investment, which eventually will affect company efficiency (Iregui et al., 2021).

Additionally, the moderating role of tax savings on the relation of capital structure and firm performance shows there are negative effect on ROA and ROE for Indonesian public construction firms. This finding shows that increasing debt for capital structure with the aim of taking advantage of tax savings has an impact on reducing the ROA of public construction companies. This occurs because public corporations have low levels of debt, which prevents them from receiving tax savings, and high tax expense lower profitability. Companies with low leverage have higher ETR since interest expense is tax-deductible (Richardson & Lanis, 2007). Meanwhile, the result for Indonesian construction SOEs show that the role of tax savings is negative yet insignificant. The negative effect indicates that high level of debt bore by SOEs does not create benefit through tax savings, and ultimately lower ROA and ROE. The insignificant effect shows that the cost of financing is high and as a result, highly leveraged firms will lose potential profits and sales (Tsuruta, 2014).

Table 5. Panel Data Regression Result with Moderating Variable

Model	Public Firms			SOE		
ROA (4)						
	Coefficient		Prob.	Coefficient		Prob.
DEB	0.198874		0.4384	-0.076163	*	0.0004
ETR	-0.011255		0.7402	-0.005292		0.6675
DEB*ETR	-0.167362		0.6378	0.022576		0.5504
SIZE	-0.034636	**	0.0175	-0.001034		0.7071
IR	-0.055747		0.8893	-0.059585		0.6759
COV	-0.033813	*	0.0007	-0.020401	*	0.0000
Constanta	0.314350		0.0090	0.063386		0.0653
R-squared	0.685138			0.826399		
F-Statistic	8.945738	*	0.000001	21.89760	*	0.000000
ROE (5)						
	Coefficient		Prob.	Coefficient		Prob.
DEB	0.539697		0.3942	-0.367552	**	0.0225
ETR	-0.032453		0.7253	-0.051298		0.7499
DEB*ETR	-0.324741		0.7266	0.586851		0.3399
SIZE	-0.103545	*	0.0057	-0.012910		0.3799
IR	-0.040953		0.9654	-1.213300		0.1215
COV	-0.083038		0.0007	-0.103811	*	0.0000
Constanta	0.909990		0.0027	0.409426		0.0493
R-squared	0.764595			0.715642		
F-Statistic	13.35286	*	0.000000	11.57680	*	0.000000
EFF (6)						
	Coefficient		Prob.	Coefficient		Prob.
DEB	-1.850338		0.1115	-0.431696		0.1836
ETR	-0.518494	**	0.0478	0.132394		0.6370
DEB*ETR	4.341625	***	0.0586	0.062950		0.9467
SIZE	0.143129		0.1220	0.070921		0.2174
IR	2.898194		0.3598	-0.283410		0.8488
COV	-0.029948		0.7377	0.040731		0.3121
Constanta	-0.300005		0.6961	0.276901		0.6322
R-squared	0.657531			0.757731		
F-Statistic	7.893215	*	0.000002	14.38713	*	0.000000

* level of significance α = 1%
** level of significance α = 5%
*** level of significance α = 10%

The significant difference in the moderating effect of tax savings between capital structure on efficiency in Indonesian public construction companies compared to SOEs indicates that the use of debt as a funding option provides benefits for public companies through tax savings. This is because the use of debt as a funding option in Indonesian public construction companies on average are lower than in state-owned companies. Thus, the bankruptcy costs arising from an increase in the debt ratio still do not exceed the benefits of tax savings obtained by the company and eventually able to improve the company's performance.

The control variable that influences the firm's ROA and ROE is the Covid-19 pandemic. The pandemic had a negative impact on company performance. Social restrictions and the suspension of company operations during the Covid-19 pandemic had a negative impact on the company's financial performance (Atayah et al., 2022). Another control variable that influences ROE and efficiency is company size. The size of state-owned companies has a more significant impact on company's efficiency compared to non-state-owned companies. Increasing company size has a positive effect on increasing productivity, due to economies of scale and economies of scope. However, when a company grows beyond a certain size, diseconomies of scale may have negative effects on productivity level (Halkos & Tzeremes, 2007).

5. Conclusion

This study aimed to investigate the effect of capital structure measured by performance of Indonesian SOEs and public-listed construction firms. In addition, it also examined the role of tax saving due to the use of leverage on the

association between debt and firms' performance. This study found that leverage negatively and significantly affect ROA and ROE of SOEs but not in the case of public firms, where the impact is positive but insignificant. These findings imply that the SOEs bore more debt compared to public firms that showed on the average of company's debt ratio. On average, the debt ratio of SOEs are nearly twice as high as Indonesian public-listed construction companies. This is due to the obligation for infrastructure development and mandatory assignments by the government. Thus, SOEs are known to search additional sources of financing, one of which is through debt. The results also justify the trade-off theory, which states that there are tax benefits resulting from the use of debt, so companies will tend to use debt to a certain level to maximize company value. Therefore, SOEs need to pay more attention to their capital structure. Based on empirical results, debt that has a negative impact indicates that the debt has exceeded the optimal level. Thus, reducing firm performance for Indonesian construction SOEs. This could be due to fact that the cost of debt for SOEs is lower than that for publicly-listed companies (Liu et al., 2016). While on public firms, the impact of debt on ROA and ROE is positive. This indicates that as company borrows more, creditors will supervise more and stringent, which could lead to an increase in the company's performance (Situngkir & Triyanto, 2020). Furthermore, public firms receive the tax saving benefit from using debt as their capital structure. This leads to the enhancement of their efficiency. Managers should consider the benefit of tax saving when making decision of capital structure. At the same time, policymakers should make laws about tax that maintain business continuity.

This research was constrained by the limited availability of data, resulting in the analysis being based solely on nine Indonesian construction firms whose financial information was accessible. We strongly advise future studies to encompass a longer and broader spectrum of construction firms, such as comparing to other countries. This would ensure a more comprehensive understanding of the effect of capital structure on the firm performance. By considering construction industry in other countries, future studies could depict a more accurate view of the relationship between capital structure and firm performance in the construction sector.

Author Contribution

Author 1: Conceptualization, original draft writing, data curation and analysis, investigation, and methodology. Author 2: Review and editing, supervision, and validation.

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Conflict of Interest

The authors state that the study was conducted without any commercial or financial relationships that could be seen as a potential conflict of interest.

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