The Effect of Trade Credit, Technology Investment, Competition on Firm Performance of Construction Companies in Indonesia

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ABSTRACT

This study aims to analyze the impact of trade credit, technology investment, and competition on firm performance in Indonesia's construction sector, which is one of the main pillars of the national economy. Indonesia's construction industry has experienced significant growth in recent decades, but also faces complex challenges, especially post-pandemic. This study uses a quantitative approach with data from construction companies in Indonesia over the period 2019-2023. The analytical method used includes multiple linear regression to examine the relationship between the independent variables (trade credit, technology investment, and competition) and the dependent variable (firm performance). The results show that trade credit has a significant positive influence on firm performance, providing important financial flexibility in running operations. In addition, technology investment is proven to increase efficiency and innovation, which has a positive impact on performance. Competition in the industry also encourages firms to adapt and improve performance, although it can create significant pressure. The findings are expected to provide insights for companies, investors, and managers regarding effective strategies to improve firm performance in the face of challenges in the construction sector. This study also recommends the need for policies that support technology investment and sound trade credit practices to promote sustainable growth in the Indonesian construction industry.

INTRODUCTION

The rapid growth of the construction industry in Indonesia as one of the main drivers of the national economy. In addition to playing a role in massive infrastructure development, the construction industry also makes a significant contribution to labor absorption (Bestwork.id, 2023). The construction sector has shown significant growth in recent decades and has the potential to continue to grow rapidly. After experiencing challenges due to the pandemic in 2020, this sector managed to record growth of 2.01% in 2022. However, construction firm performance is often threatened by project management issues, high debt burdens, and difficulties in adapting to market changes (Adesegha, 2024). The threat of delisting can occur for companies that are unable to maintain performance, which has a negative impact on the company's access to trade credit and financial stability (Wibowo, F. A., Satria, A., Gaol, S. L., & Indrawan, D, 2024).

Trade credit acts as an important financial tool that supports long-term company stability, allowing companies to better manage cash flow and maintain liquidity when purchasing materials or goods without having to pay directly (Ulwan, J., Fariza, N., Hasini, M., Aini, N., Rais, M., & Ibrahim, R, 2021). In addition to trade credit, technology investment is an important component in increasing company efficiency and competitiveness. Companies that invest in modern technology tend to experience increased performance through innovation and business process improvement (Adejumo et al., 2020). The relationship between technology investment and firm performance shows that companies that make significant investments in technology are able to improve the quality of products or services and reduce operating costs. Companies that adopt new technologies are better able to adapt to market changes and show an increase in revenue growth (Wang, 2019). With increasing competition in the construction sector,

it is important to understand the impact of trade credit, technology investment, and other factors such as competition on firm performance. This study aims to fill the gap in the existing literature and provide deeper insights into the strategies that construction firms can adopt to improve their performance amidst the challenges.

1. Literature Review

Firm Performance

Firm performance is a measure of a company's success in achieving its goals, which includes achieving financial goals and other operational aspects. Firm performance can be measured through two main indicators: financial and non-financial indicators (Mouzas & Bauer, 2022). Financial indicators, such as Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM), are important for assessing performance from a financial perspective (Ahsan & Qureshi, 2021). Meanwhile, non-financial indicators include aspects such as profitability, efficiency, innovation, and competitiveness (Sebayang & Sebayang, 2020). By considering these various aspects, managers can assess performance comprehensively and adjust strategies to achieve sustainable competitive advantage (Farooq, M., Qureshi, S. F., & Bhutta, Z. M, 2021). An effective management team can optimize resources and create the innovation needed to stay competitive in the market (Fu et al., 2024).

Trade Credit

Trade credit is often also called merchant credit which is a loan given by a supplier to a buyer, allowing the buyer to purchase goods without having to pay in advance, with a specified payment deadline (Białek-Jaworska & Nehrebecka, 2016). With trade credit, companies gain flexibility in the use of funds, allowing them to conquer existing markets (Setiawan & Nareswari, 2023). Trade credit gives companies time to pay for the needs taken from suppliers, so that funds can be used for other purposes (Wu et al., 2014). Some of the reasons companies make sales on credit include increasing sales, utilizing idle production capacity, and competitive reasons (Sudiantini et al., 2023). However, credit sales carry costs, both direct such as collection costs, and indirect such as the opportunity cost of funds tied up in trade receivables, and losses due to bad debts.

Technology Investment

Technology Investment refers to the allocation of financial resources to acquire, develop, or implement technology to improve a company’s efficiency, productivity, and competitiveness. This includes spending on hardware, software, and innovation that support operations and new product development. According to Kapoor & Teece (2021), investment in technology is essential to adapt to market changes and add value to the products and services offered. Companies that invest significantly in technology tend to experience higher revenue growth and are able to meet customer expectations (Nascimento et al., 2021). Furthermore, the right technology and good integration with existing operational practices are essential to maximize the return on investment (Alvi et al., 2023). Well-adopted technology can reduce communication barriers and increase team productivity, indicating that the impact of technology investment goes beyond operational efficiency and affects work dynamics within the organization (Havakhor et al., 2022). By leveraging technology, companies can accelerate innovation and strengthen their competitive position in the global market (W. Song & Wang, 2023).

Competition

Competition refers to the level of rivalry in an industry or market that can affect a company's performance in various aspects, including profitability, innovation, and operational efficiency. Competition in the market often serves as a driver for companies to improve performance, either through product innovation or process optimization (Xuan Ha & Thi Tran, 2022). Pressure from competition encourages management to prioritize short-term economic value creation, sometimes at the expense of

more long-term governance aspects, such as sustainability and social responsibility (Chhaochharia et al., 2017). Competition can also improve organizational performance by reducing internal conflict and improving quality control (Moyo, 2018). Furthermore, optimal competition can maximize performance, while very low or very high levels of competition can pose adverse risks to the company (Kumari & Singh, 2022).

Gross Domestic Product

Gross domestic product is one of the main macroeconomic indicators that reflects economic conditions (Usman et al., 2024). GDP is important for measuring the strength of a country's economy, providing relevant information on economic development and health, and supporting social growth (Shams et al., 2024). Gross domestic product is influenced by various factors, including investment and government spending (Nurrini, 2019). Increased consumer demand, public spending, and investment opportunities in the market also contribute to this growth, allowing companies to strengthen their market positions and increase profitability (Y. Zhang et al., 2022). Gross domestic product is calculated based on market prices (actual) which will help analyze the sectoral structure of the economy. However, this method cannot assess the dynamics of the economy as a whole (Turlo et al., 2024).

Firm Size

Firm Size is a measure that describes the size of a company, which affects the performance of management in carrying out its duties (Fiscal & Agatha, 2015). Larger companies may have better opportunities for revenue diversification because they are able to gain new markets and lower revenue volatility (Mutianingsih et al., 2024). However, the larger a company, the higher the costs it must bear (Cahyana & Suhendah, 2020). Investors are interested in a company's ability to manage its assets effectively and achieve greater performance and profits when its overall assets grow (Muchdiarti et al., 2023). Some common criteria for measuring firm size include the number of employees, total assets, market capitalization, and revenue and sales. The more employees or assets owned, the larger the company can be valued (Soemardi et al., 2020).

Growth Opportunities

Growth opportunity is the opportunity that a company has to generate future income (Edward, 2022). Growth opportunity reflects the company's potential to generate higher cash flows in the future through investment in new projects, increased production capacity, or business diversification, which has an impact on the company's overall performance (S. Zhang et al., 2023). Companies that grow rapidly usually need to add fixed assets to support development, thus requiring more funds in the future and retaining more profits (Edward, 2022). This allows the company to remain competitive in a tight market, which is attractive to investors (Permatasari & Ramadhan, 2023). Growth Opportunities can be measured through increased sales, assets, or equity. When growth opportunities are proven to drive investment, this can increase competitiveness and expand market share, as well as improve firm performance (Bolek et al., 2022).

Leverage

Leverage plays an important role in influencing firm performance, where moderate use of leverage can help companies fund profitable investments, improving overall financial performance (Afrianti et al., 2022). However, excessive use of leverage can worsen a company's financial condition if revenues are unable to cover interest expenses and principal repayments. A high proportion of corporate debt poses a significant risk to the company's ability to repay its debt (Endartono et al., 2022). When used efficiently, leverage allows companies to take advantage of investment opportunities without having to release equity, but if the debt is too large, the company is at risk of facing liquidity pressures and solvency problems (Tian, 2022). Companies with high leverage tend to be more disciplined in managing cash flows and focus

on projects that generate positive cash flows to meet debt obligations (Li et al., 2023). Information quality and financial leverage interact with each other in investment decisions, Nan & Wen (2023) found that a positive relationship between leverage and optimal information quality occurs when leverage is low and vice versa, high information quality is optimal when leverage is high.

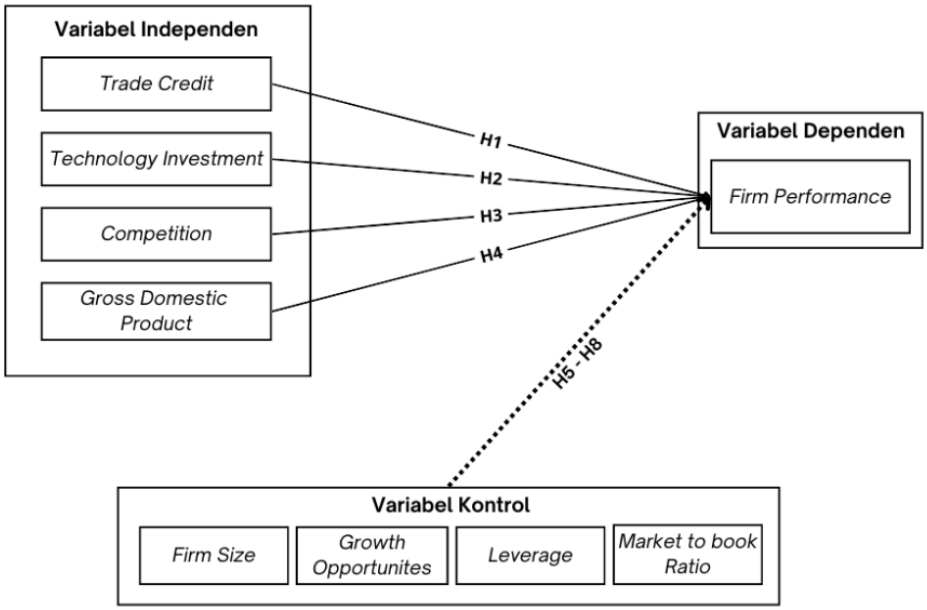
Market to book Ratio

Market-to-book-ratio is a ratio that shows the comparison between the market price of shares and the book value of the company (Gabriella Langi et al., 2023). According to Efendi & Herawati, (2019), this ratio describes the market value of the company's stock equity compared to the accounting value of equity. Investors often use the market-to-book ratio to assess whether a company's shares are overvalued or undervalued based on the assets it owns (Kumar & Singh, 2023). Companies with a high market-to-book ratio tend to carry out earnings management to meet market expectations, which can improve the company's performance image in the eyes of investors (Gabriella Langi et al., 2023). From an investment perspective, investors use this ratio to measure how much growth opportunities a company has, so companies with a high ratio will find it easier to attract capital from the market (Barth, 2024). However, companies with a high market-to-book ratio tend to avoid tax avoidance practices (Tanujaya et al., 2021). Overall, the market-to-book ratio is used to measure a company's future growth potential, which is an important indicator of a company's ability to obtain future investment.

2. Hypothesis Development

With the research results above, the conceptual framework is as follows:

Figure 1. Conceptual Framework



Source: Data Processed, 2024

From this framework, a hypothesis can be formulated:

The Influence of Trade Credit on Firm Performance

Trade credit refers to the amount of money recognized as owed to another party arising from the sale of goods or services on credit (Hayati et al., 2024). Research conducted by Apriliani et al. (2022) states that trade credit partially influences future operating cash flows concerning sales growth. This aligns with the findings of Yofi Luqmanul Hakim (2020), who noted that trade credit has a significant partial

impact. Furthermore, Asif & Nisar (2023) support previous studies indicating a positive relationship between trade credit and firm performance. However, other studies also highlight that, despite the inherent benefits of trade credit, companies face challenges related to ineffective credit risk management (Okpala et al., 2019). Based on the discussion above, the following hypothesis is proposed:

H_1: Trade Credit affects Firm Performance

The Influence of Technology Investment on Firm Performance

Technology investment refers to expenditures made by companies on research and development (R&D) to create more environmentally friendly solutions (P. Song et al., 2023). Research conducted by Bhatta et al (2023) shows a positive and significant influence of technology investment on a company's sustainable performance. Consistent with previous findings, the study highlights the importance of investing in technology to enhance firm performance. Companies that effectively adopt new technologies are better positioned to compete and adapt to market changes (Bhatta et al., 2023). AlMulhim (2021) also found that technology plays a crucial role in linking digital transformation with firm performance. The utilization of digital technology has been shown to accelerate firm growth and performance (Sinaga et al., 2020). These findings underscore the importance of internal factors, such as competition and technology, in achieving optimal performance. Based on the discussion above, the following hypothesis is proposed:

H_2: Technology Investment affects Firm Performance

The Influence of Competition on Firm Performance

Competition influences company strategies and behaviors in various ways, which subsequently impact financial performance, including profitability, operational efficiency, innovation, and market share. Companies must be more efficient in utilizing resources and managing operational costs to maintain a competitive edge in the market (Han et al., 2022). According to Tuyet & Ninh (2023), competition has a positive impact on firm performance, providing in-depth insights into how competition affects corporate outcomes.

This is evident from the significant positive effects of competition in domestic product markets and local labor markets on company productivity (Ma et al., 2022). Additionally, competition from imports also has a significant positive influence on improving corporate efficiency, with the effects becoming more apparent in the long term, as companies need time to adapt to increasing competitive pressures (Construcci, 2019). Furthermore, appropriate competition can amplify the positive effects of marketing strategies on company performance (Kotler & Keller, 2021). Another study by Liljeblom et al (2020) also found that competition has a significant positive impact on firm performance, especially when competition is well-moderated through appropriate marketing strategies. Based on the discussion above, the following hypothesis is proposed:

H_3: Competition affects Firm Performance

The Influence of Gross Domestic Product on Firm Performance

Gross Domestic Product (GDP) can be defined as the total market value of all goods produced within a company over a specific period (Mankiw, 2019). Research conducted by (Doan, 2020), indicates that GDP has a positive effect on firm performance, as measured by Return on Assets (ROA). Previous studies support the theory that favorable macroeconomic conditions, such as GDP growth, can enhance a company's market performance (Doan, 2020). An increase in GDP within a country reflects improved societal welfare, which does not always lead to increased activity in capital markets but may instead drive investment in other sectors, such as money markets (Dewi & Artini, 2019). This phenomenon occurs because rising national income also signals an improvement in firm performance. This aligns with the findings of Asif & Nisar (2023), who also concluded that GDP positively influences firm performance. Based on the discussion above, the following hypothesis is proposed:

H_4: Gross Domestic Product affects Firm Performance

The Influence of Firm Size on Firm Performance

One of the most relevant theoretical perspectives to explain the influence of firm size on firm performance is the Resource-Based View (RBV) theory. This theory explains that a company's competitive advantage is based on its unique resources and capabilities (Felzensztein et al., 2022). Research conducted by Weinzimmer et al (2023) supports the view that firm size provides competitive advantages, as larger companies have greater capacity for long-term investments in their activities, which positively impacts firm performance. According to Oktaviani et al. (2019), firm size was found to have a significant negative effect on firm performance. However, research by Wijaya & Sasmita (2023) concluded that firm size has a significant positive impact on financial performance. This is because larger companies bear higher costs but also possess more resources and assets that support operational efficiency, ultimately improving profitability and financial performance. Based on the discussion above, the following hypothesis is proposed:

H_5: Firm Size affects Firm Performance

The Influence of Growth Opportunities on Firm Performance

The influence of growth opportunities on firm performance can be analyzed from various theoretical perspectives, one of which is the Resource-Based View (RBV) theory. This theory emphasizes the importance of managing internal resources as a key to creating competitive advantage. In the context of growth opportunities, companies with access to unique resources, such as innovative technologies and robust distribution networks, can more effectively capitalize on growth opportunities (Joensuu-Salo & Matalamäki, 2023). A high growth rate indicates that company management possesses the skills and strategies needed to effectively manage sales, resulting in increased revenue over time (Rakhmawati et al., 2024). Growth Opportunities according to Amin, M., A. & Khilmi, T (2023), liquidity, leverage, and growth collectively have a significant impact, meaning that an increase in liquidity, leverage, and growth simultaneously will lead to improved firm performance. This aligns with research by Asif & Nisar (2023) which found that growth opportunities positively influence firm performance. Similarly, Vania & Ardiansyah (2023) also concluded that growth opportunities have a positive and significant impact on firm performance. Based on the discussion above, the following hypothesis is proposed:

H_6: Growth Opportunities affects Firm Performance

The Influence of Leverage on Firm Performance

Leverage's impact on firm performance can be analyzed from various theoretical perspectives, including the trade-off theory. This theory posits that companies need to find an optimal balance between debt and equity to maximize performance (Indomo & Lubis, 2023). On one hand, leverage can provide benefits such as tax savings, as interest on debt is often tax-deductible, and it can enhance returns for shareholders. On the other hand, increased leverage also introduces risks, including bankruptcy risks and higher financial costs (Stoiljković et al., 2022). Therefore, companies must carefully assess their risk profiles and consider market conditions and long-term growth strategies when determining the appropriate level of leverage. Research by Anandayama & Suwardi (2021), found that leverage negatively affects company performance. Consistent with this, other studies also indicate that liquidity, leverage, and growth collectively have a significant impact (Amin, M., A. & Khilmi, T., 2023). These findings are further supported by research conducted by Asif & Nisar (2023) which highlights that leverage has a significant influence on firm performance. Based on the findings of the studies above, the following hypothesis is proposed:

H_7: Leverage affects Firm Performance

The Influence of Market to Book Ratio on Firm Performance

The Market-to-Book Ratio's impact on firm performance can be analyzed from various perspectives. According to the Market Value Theory, this ratio reflects the market's perception of a company's value compared to the book value of its assets (Kim, 2023). Additionally, a low ratio may indicate that a company is considered undervalued, potentially harming performance if not addressed with effective communication strategies (Grzybek, 2023). Research by Lillah & Yuyetta (2023) asserts that the market-to-book ratio positively affects firm performance, consistent with findings by Asif & Nisar (2023), which highlight a strong positive impact across three models. Their study suggests that companies with higher market values enjoy greater investor confidence, enabling them to adopt aggressive financing strategies to achieve profitability. However, the findings also suggest that a high market-to-book ratio may indicate poor performance and a tendency toward financial distress or unfavorable future prospects. Based on the findings of the studies above, the following hypothesis is proposed:

H_8: Market to Book Ratio affects Firm Performance

RESEARCH METHOD

Each variable is measured to assess the impact of the independent variable on the dependent variable, with measurements:

Table 1. Definition of Operational Variables

Variable Types	Variable Name	Symbol	Definition of Operational Variables	Reference
Dependent Variable	*Return On Asset*	ROA	$\frac{\text{Net Income}}{\text{Total Asset}}$	(Septika Wati & Arifin, 2023)
Independent Variable	*Trade Credit*	TC	$\frac{\text{Trade Receivables}}{\text{Total Asset}}$	(Asif & Nisar, 2023)
	Technology Investment	TI	$\frac{\text{Investment Technology}}{\text{Total Income}}$ (all costs incurred for matters relating to technology)	(Chhabra Roy, 2021)
	Competition	CP	$HHI_{jt} = \frac{\text{Total Revenue}}{\text{HHI :Total Revenue}}$	(Xuan Ha & Thi Tran, 2022b)
	Gross Domestic Product	GDP	Annual GDP Growth	(Asif & Nisar, 2023)
	Firm Size	FS	Total size of the firm = total asset	(Kabir et al., 2023)
	Growth Opportunities	GO	$\frac{\text{Sales Present-Sales Past}}{\text{Sales Past}}$	(Asif & Nisar, 2023)
Control Variable	*Leverage*	LEV	$\frac{\text{Debt}}{\text{Total Asset}}$	(Asif & Nisar, 2023)
	Market to book Ratio	MB	$\frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$	(Lillah & Yuyetta, 2023)

Source: Data Processed, 2024

The collection of data obtained indirectly (secondary data) is the data collection method used in this study. The data sources for this research were obtained through the Indonesia Stock Exchange website

(https://www.idx.co.id), from which data for each company sampled in this study were gathered. The research data consists of data from construction companies listed on the Indonesia Stock Exchange for the 2019–2023 period. In this study, the data collection method used was purposive sampling. This method was chosen based on considerations focusing on specific objectives. In other words, the sample for this study consists of companies that meet certain predetermined criteria. The sample in this study includes 210 financial reports from 42 construction companies drawn from the population of construction companies listed on the Indonesia Stock Exchange, based on the 2019 factbook, over a five-year period (2019–2023). The criteria underlying the selection of data as research samples are as follows: 1) Construction companies listed on the Indonesia Stock Exchange during the testing and analysis period (2019–2023). 2) Availability of data related to the measurement of each variable for each company. 3) Availability of financial statements and annual reports for the 2019–2023 period. 4) Financial statements presented with a fiscal year ending in December.

The results of the analysis in the Chow test and Hausman test show a cross-section probability value of Chi-square <0.05, so H_0 is rejected so that the model used is the Fixed Effect Model (FEM). The results of the analysis in the F test show that the probability value of the F-statistic < 0.05; indicating that the independent variables simultaneously influence the dependent variables, so that the regression model is suitable for use. The results of Goodness of Fit (R^2) test indicate that the independent variables are able to explain about 88.4695% of the variation in ROA, while the remaining 11.5305% can be explained by other factors not included in this model.

RESULTS AND DISCUSSION

Explanation of data characteristics is obtained by descriptive statistics. Data characteristics used in the study are seen from the minimum, maximum, mean, median and standard deviation values. Descriptive statistics can be seen in the following table:

Table 2. Descriptive Statistics

Variable	N	Mean	Min.	Max.	Standard Deviation
Firm Performance	210	0.019458	-0.185812	0.277367	0.060522
Trade Credit	210	0.035795	0.000000	0.369042	0.057728
Technology Investment	210	0.011784	1.7763305	0.100582	0.017695
Competition	210	0.011693	0.000000	0.266792	0.035687
Gross Domestic Product	210	0.033980	-0.020700	0.053000	0.027982
Firm Size	210	29.20488	24.73459	31.94944	1.616857
Growth Opportunities	210	0.121241	-0.812551	5.872436	0.661064
Leverage	210	0.408485	0.048652	1.363488	0.238800
Market to Book Ratio	210	0.905250	-0.969224	12.55000	1.333134

Source: Data Processed, 2024

Partial Test (T-Test) is conducted to see whether each independent variable has a significant influence on the dependent variable. The decision-making criteria are if sig.t <0.05, H_0 is rejected and if sig.t >0.05, H_0 is accepted. The results of the regression t-test can be seen in the following table:

Table 3. T-Test Results

Independent Variable	Dependent Variable		
	Return on Assets		
	Coefficient	Probability	Conclusion
Constants	-0.604454	-	-
TC	-0.075281	0.1832	Not Significant
TI	-0.490296	0.0001	Negative Significant
CP	0.133063	0.0017	Positive Significant

Independent Variable	Dependent Variable		
	Return on Assets		
	Coefficient	Probability	Conclusion
GDP	0.135746	0.0003	Positive Significant
FS	0.022464	0.0757	Not Significant
GO	0.006060	0.0152	Positive Significant
LEV	-0.078861	0.0021	Negative Significant
MB	0.001808	0.0000	Positive Significant

Source: Data Processed, 2024

Multiple Regression Equation:

ROA = -0.604454 - 0.075281TC - 0.490296TI + 0.133063CP + 0.135746GDP + 0.022464FS + 0.006060GO - 0.078861LEV + 0.001808MB

H_1: Trade Credit does not affect Firm Performance

Based on the regression test results, the results of this research indicate that there is no significant effect between the trade credit and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the trade credit has a coefficient value -0.075281 with a significant value of firm performance of 0.1832 > 0.05. The results of the regression test indicate that there is no significant effect between trade credit and firm performance in construction companies in Indonesia. The negative relationship between trade credit and firm performance indicates that if trade credit increases, company performance tends to decrease, although this relationship is not significant. This result aligns with the research conducted by Apriliani et al. (2022) which states that partially increasing trade credit can affect future operating cash flow on sales growth. This result aligns with the research conducted by Yofi Luqmanul Hakim (2020) which states that trade credit partially has an impact on firm performance.

H_2: Technology Investment affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant negative effect between the technology investment and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the technology investment has a coefficient value -0.490296 with a significant value of firm performance of 0.0001 < 0.05. The regression test shows that there is a negative and significant effect between technology investment and firm performance in construction companies in Indonesia. The negative relationship between technology investment and firm performance shows that an increase in technology investment tends to be followed by a decrease in firm performance. This result is not in line with previous studies by Bhatta et al (2023) dan Sinaga et al (2020) which stated that there is a positive and significant effect of technology investment on the company's sustainable performance. Technology investment refers to spending by companies to adopt and implement new technologies that can improve operational efficiency, innovation, and overall performance because the technological environment also has a significant effect on firm performance.

H_3: Competition affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant positive effect between the competition and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the competition has a coefficient value 0.133063 with a significant value of firm performance of 0.0017 < 0.05. This means that there is a positive and significant relationship between competition and firm performance in the construction sector in Indonesia. The positive influence of the coefficient value indicates that when the level of competition increases, company performance also tends to increase. This means that companies operating in a competitive environment

can spur themselves to perform better. There is a real relationship between competition and firm performance. This result aligns with the research conducted by Construcci (2019) which states that competition also shows a significant positive effect on increasing company efficiency, although this effect appears gradually after trade liberalization. In general, the effect of competition on company performance is statistically significant. According to Tuyet & Ninh (2023) the impact of competition on firm performance shows positive results, and well-managed competition can provide a number of benefits. In addition, companies become more motivated to reduce costs, increase efficiency, and utilize resources more effectively.

H_4: Gross Domestic Product affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant positive effect between the Gross Domestic Product (GDP) and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the GDP has a coefficient value of 0.135746 with a significant value of firm performance of 0.0003 < 0.05. This means that if the gross domestic product increases, firm performance also tends to increase. This shows that economic growth can have a positive impact on construction companies in Indonesia. This result aligns with the research conducted by Doan (2020) which states that GDP shows a positive effect on firm performance as measured by ROA. Although the effect of GDP on firm performance is not considered statistically significant, this positive relationship indicates that better economic growth can support improved company performance. This result aligns with the research conducted by Ajeng & Prasetiono (2016) who stated that GDP has a positive effect because increasing income in a country also indicates increasing firm performance.

H_5: Firm Size does not affect Firm Performance

Based on the regression test results, the results of this research indicate that there is no significant effect between the firm size and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the firm size has a coefficient value of 0.022464 with a significant value of firm performance of 0.0757 > 0.05, which indicates that the detected effect is not statistically significant. This shows that it cannot reject the null hypothesis, which states that there is no significant effect between firm size and firm performance. This indicates that company size does not contribute significantly to improving company performance in the context of construction companies in Indonesia. This result aligns with the research conducted by Rousilita Suhendah (2020) which states that firm size does not have a significant effect on company performance, although company size is often considered an indicator of stability and capacity to overcome business challenges, the results of the study show that larger construction companies are not always more efficient in managing assets and resources.

H_6: Growth Opportunities affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant positive effect between the growth opportunities and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the growth opportunities have a coefficient value of 0.006060 with a significant value of firm performance of 0.0152 < 0.05, which indicates that this effect is statistically significant. Statistically, it can be concluded that the effect is significant in the construction sector in Indonesia. With profitable growth opportunities, companies can be more motivated to invest in new technologies, employee training, and more complex project development. This can improve efficiency and service quality, which in turn has a positive impact on performance. This result aligns with the research conducted by Amin, M., A. & Khilmi, T (2023) which states that liquidity, leverage, and growth opportunities have a simultaneous effect, which means that if there is an increase in these three factors simultaneously, the firm performance will increase. This result aligns with the research conducted by Vania & Ardiansyah (2023) which states that growth opportunities have a positive effect on firm performance.

H_7: Leverage affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant negative effect between the leverage and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the leverage has a coefficient value of -0.078861 with a significant value of firm performance of 0.0021 < 0.05, which indicates that this effect is statistically significant. Overall, these results indicate that in the context of construction companies in Indonesia, increasing leverage has a negative impact on firm performance, and this relationship is statistically significant. This result aligns with the research conducted by (Hau NGUYEN et al., 2021), which states that leverage has a negative effect on firm performance. This study shows that the debt to total asset ratio has an effect on ROA. Then the research conducted by Anandayama & Suwardi (2021), also stated the same thing that leverage has an effect on firm performance.

H_8: Market to Book Ratio affects Firm Performance

Based on the regression test results, the results of this research indicate that there is a significant positive effect between the market to book ratio and firm performance in Indonesia construction companies. This is stated from the results of the t-test where the market to book ratio has a coefficient value of 0.001808 with a significant value of firm performance of 0.0000 <0.05, which indicates that this effect is statistically significant. The data concludes that there is a real relationship between the market to book ratio and firm performance. These results indicate that in the context of construction companies in Indonesia, an increase in the market to book ratio is related to an increase in firm performance, and this effect is proven to be statistically significant. This result aligns with the research conducted by Asif & Nisar (2023) where the market to book ratio shows a strong positive effect on performance in all three models which state that companies with high market value have better investor confidence so that they can use aggressive financing strategies in order to gain profit.

CONCLUSION

Based on the research findings, the following conclusions can be drawn: Trade credit has an insignificant effect on firm performance; technology investment has a negative and significant effect on firm performance; competition has a positive and significant effect on firm performance; gross domestic product has a positive and significant effect on firm performance; firm size has an insignificant effect on firm performance; growth opportunities have a positive and significant effect on firm performance; leverage has a negative and significant effect on firm performance; and market-to-book ratio has a positive and significant effect on firm performance.

For companies, this research provides several important implications. First, technology investment has the potential to improve performance, but companies must be selective in choosing technologies that align with their business needs. Second, healthy competition positively impacts both company and employee performance, motivating employees to achieve higher targets. Third, gross domestic product (GDP) offers opportunities for company growth. Furthermore, while firm size is not always a primary determinant of performance, growth opportunities correlate positively with performance, as they provide room for expansion and innovation. Therefore, maintaining a balance between equity and debt is crucial. Lastly, the market's perception of a company's value, represented by the Market-to-Book Ratio, influences the company's access to funding sources.

For investors, the findings of this research can serve as a guide for both domestic and international investors in making investment decisions in construction companies in Indonesia. The research results indicate that the variables of technology investment and leverage do not have a significant impact, meaning that to achieve optimal firm performance in the long term, investors should consider maintaining low levels of technology investment and leverage to ensure the company remains competitive. On the other hand, competition, gross domestic product (GDP), growth opportunities, and market-to-book ratio

show significant results, suggesting they positively influence firm performance and can be further enhanced to sustain growth and ensure future sustainability.

For managers, the research findings indicate that the implementation of technology and the use of debt do not always guarantee improved performance. Factors such as the misalignment of technology with business strategies, lack of employee competence, high investment costs, and excessive debt burdens can pose significant challenges. To ensure that technology investments are not wasted and to avoid inefficiencies, managers need to take strategic steps, such as evaluating each technology investment to align with business goals, carefully managing leverage, investing in employee competency development, considering alternatives like simpler technologies or strategic partnerships, and applying lean manufacturing principles to enhance efficiency. By doing so, construction companies can maximize the benefits of technology investments without compromising financial performance.

Based on the results of this study, several limitations were identified. The research period only covered five years, from 2019 to 2023. Additionally, the variables measured were limited to eight, consisting of technology investment, competition, trade credit, gross domestic product, firm size, growth opportunities, leverage, and market-to-book ratio in relation to firm performance. Future researchers in the same field are advised to include additional variables that may influence firm performance, such as corporate governance (Nguyen et al., 2024), board gender diversity (Brinette et al., 2024), and audit committee size (Jibril et al., 2024).

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