Journal of Enterprise and Development (JED)
Vol. 6, No. 1, 2024
ISSN (PRINT): 2715-3118, ISSN (ONLINE): 2685-8258

Determinants of financial distress in the building construction sub-sector companies listed on the Indonesia Stock Exchange

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ABSTRACT

Purpose — *This study aims to analyze the influence of profitability, leverage, and intellectual capital on financial distress in companies within the building construction sub-sector.*

Method — *The research method involves quantitative and regression analysis. The sample consists of companies within the building construction sub-sector that consistently published financial reports during the period 2016-2021. The research population comprises 96 building construction companies listed on the Indonesia Stock Exchange, with 16 companies meeting the sample requirements. Data collection is performed using purposive sampling, and the analysis is conducted using EViews 10. Various tests, including classic assumption tests, feasibility analysis models, panel regression analysis, and coefficient of determination tests, are employed in the analysis.*

Result — *The study results indicate a significant positive effect of profitability on the level of financial distress, suggesting that higher levels of profitability correspond to lower financial distress. Conversely, leverage demonstrates a significant negative effect on financial distress, implying that higher levels of leverage are associated with increased financial distress for the company. However, the study did not identify a significant relationship between intellectual capital and the level of financial distress, suggesting that the level of intellectual capital does not significantly influence the level of financial distress.*

Practical implications — *Management in the building construction sub-sector is encouraged to prioritize strategies and tactics aimed at enhancing company profitability. Focusing on efforts to improve operational efficiency, optimize asset utilization, and enhance the effectiveness of marketing strategies can contribute to an increase in the company's profitability.*

Keywords: *profitability, leverage, intellectual capital, financial distress, building construction companies*

INTRODUCTION

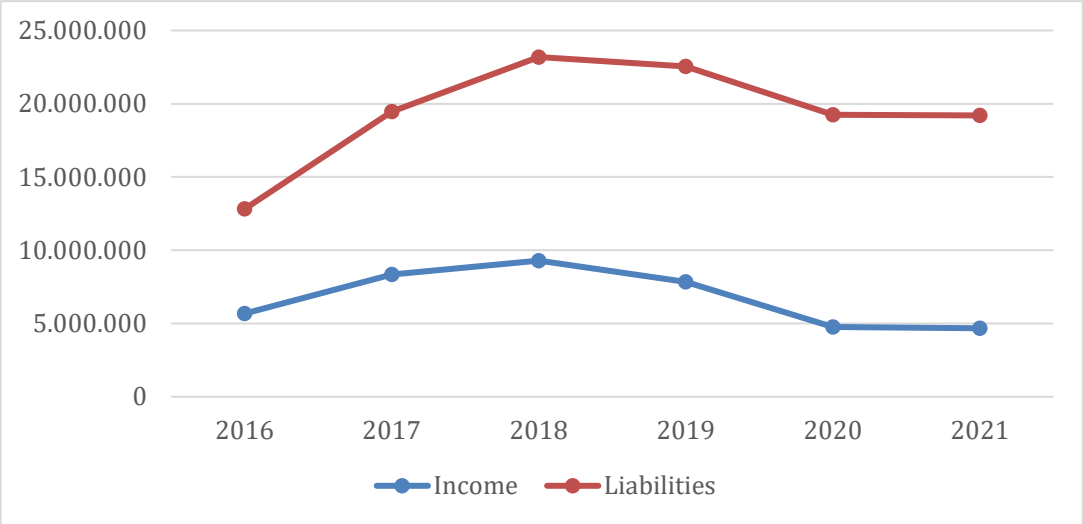
The construction industry plays a crucial role in the economic development of a region, particularly in infrastructure and facility development. In Indonesia, the Building Construction Sub-Sector, listed on the Indonesia Stock Exchange (IDX), is a significant contributor to the construction of buildings, housing, and various infrastructure projects. With rapid economic growth and urbanization, there has been a substantial increase in demand for services from companies within this sub-sector (Opitalia & Zulman, 2019). From 2016 to 2021, Indonesia has witnessed several economic trends and events directly impacting companies in the Building Construction Sub-Sector. The government's prioritization of infrastructure development as part of its national development program has led to robust growth in the construction sector. Substantial investments in this sector present significant opportunities for companies to thrive and develop (Dini et al., 2023).

The construction and building sector attract investor interest due to its long-term investment potential, with property serving as a versatile asset usable as collateral by companies. However, the industry faces constant changes and challenges, including shifts in consumer preferences, economic conditions, political factors, technological advancements, local and global competition, supplier dynamics, and government policies. This dynamic environment intensifies competition

among companies (Elfriandi & Sudjono, 2023). To navigate this competition, companies are not only expected to be healthy and innovative but also to capitalize on existing opportunities for survival and growth. Operational development, company expansion, and competition necessitate significant funding. Meeting these financial needs requires efforts to secure funds for injecting into the company's operations and business development. The capital market serves as a means of forming and accumulating funds, promoting public participation in funding to support development (Halian et al., 2020).

Despite the crucial role played by construction companies, the sector encounters various challenges, including changes in government regulations, fluctuations in raw material prices, shifts in market demand, and intense competition. The construction services sector is deemed strategic in the economy, closely linked to the implementation of fiscal policy and making a substantial contribution to GDP. In the fourth quarter of 2021, the construction sector accounted for 10.48% of GDP, establishing itself as one of the largest fiscal contributors to the country (BPS, 2021).

Figure 1. Average income and liabilities of construction services companies (in millions of rupiah)



Source: Yahoo Finance (2021)

In 2016, the average business income from projects managed by construction service companies saw an initial increase. However, this upward trend was short-lived, as a decline began in 2019, marked by a decrease in the average income earned. Of concern is the observation that, from the perspective of total liabilities, an increase in income correlates with a significant rise in the average total liabilities of construction companies. This contradiction presents a challenge: while infrastructure development is extensive, the costs borne by construction service companies are becoming increasingly burdensome, posing a threat to the sustainability of both privately owned and state-owned businesses.

Earlier research on factors influencing financial distress has yielded varied results. Studies by Muliadi (2022) and Silvia & Yulistina (2022) found an insignificant positive effect of liquidity on financial distress, whereas Setiawan & Fitria (2020) reported a significant negative effect. Erayanti (2019) and Komala & Triyani (2019) discovered an insignificant positive effect of leverage on financial distress, whereas Purwanti & Syarif (2022) found a significant positive effect. Additionally, Dženopoljac et al. (2016), Habib & Kayani (2022), and Nadeem et al. (2016) reported a significant positive effect of intellectual capital on financial distress, while Cenciarelli et al. (2018) found a significant negative effect. Notably, there is a research gap concerning a specific focus on a sample of companies in the Building Construction sub-sector in IDX.

Previous studies on factors influencing the financial capacity of the construction sector have highlighted key variables such as profitability, leverage, and intellectual capital as potential influences on the financial health of companies. This study introduces several novelties, including data collection from 2016 to 2021, coinciding with the COVID-19 pandemic that significantly affected financial performance. The research variables differ from those used in previous studies, leading to the development of distinct hypothesis testing. The contribution of this research lies in its specific concentration on Building Construction Sub-Sector companies in Indonesia, examining the interplay between financial performance variables and the financial distress of companies within this sub-sector.

Therefore, the study aims to determine the impact of profitability, leverage, and intellectual capital on financial distress in Building Construction sub-sector companies.

METHOD

This study employs a quantitative research method, specifically utilizing regression analysis. The research focuses on companies within the Building Construction sub-sector, comprising a population of 96 companies listed on the Indonesia Stock Exchange (IDX) from 2016 to 2021. Out of this population, 16 companies meet the specified sample requirements.

The independent variables in this research include profitability, represented by Return on Assets (ROA), leverage proxied by Debt to Asset Ratio (DAR), and intellectual capital represented by Value Added Intellectual Coefficient (VAIC). ROA measures the ability of capital invested in overall assets to generate net income (Erayanti, 2019). DAR assesses the company's ability to guarantee its debts with the assets it possesses (Muhtar, 2017). VAIC provides a clearer picture of the business and its affiliates (Shahwan & Habib, 2020).

Data for the study are sourced from secondary data obtained from bps.go.id, Bank Indonesia, and financial reports of companies listed on the Indonesia Stock Exchange (IDX). The researcher collects data using the purposive sampling method, and the analysis is conducted using EViews 10. Various tests, including classic assumption tests, feasibility analysis models, panel regression analysis, and coefficient of determination tests, are employed in the data analysis process.

To test the hypotheses formulated in this research, the regression equation will be used as follows:

$$ZSCORE = \beta 0 + \beta 1 * ROA + \beta 2 * DAR + \beta 3 * VAIC + \varepsilon$$

Explanation:

ZSCORE	: The dependent variable that measures the level of financial distress
ROA	: Return on Asset
DAR	: Debt to Assets ratio
VAIC	: Value Added Intellectual Coefficient
β0	: Constant
β1, β2, β3	: Regression coefficients
ε	: Error coefficient

Hypotheses development

The influence of profitability on financial distress

ROA, or Return on Assets, serves as an indicator for a business unit to assess the return on a set of assets owned by that unit. This ratio is employed to gauge management's proficiency in generating overall profits. A higher ROA indicates greater profitability achieved by the company, reflecting a more favorable position in terms of asset utilization. Conversely, companies with

lower profitability levels are more susceptible to the risk of financial distress, potentially facing challenges in meeting their financial obligations (Ngatno et al., 2021). Successful company management that attains a high level of profit signals positively to investors, indicating strong industry performance and the capability to meet financial obligations effectively (D'Amanto, 2022).

H1: ROA has a positive effect on financial distress in the Building Construction sector industry

The influence of leverage on financial distress

When a company is in debt, it incurs obligations to pay interest and principal on the loan. In challenging circumstances, especially when the company experiences a sustained decline in profits or consecutive losses, meeting debt obligations may become untenable. In such instances, the company faces an increased likelihood of financial distress (Mesrawati et al., 2022). A financial company that relies heavily on debt is exposed to the risk of payment difficulties in the future, particularly if its debt surpasses its generated returns. Failure to address this situation adequately amplifies the potential for financial distress (Kalash, 2023).

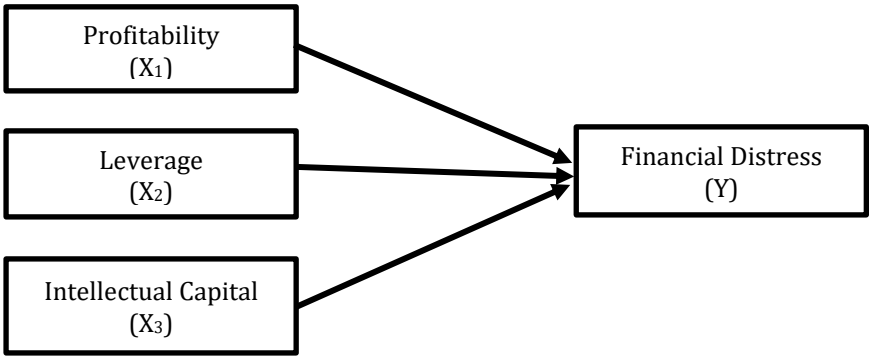
H2: DAR has a negative effect on financial distress in the Building Construction sector industry

The influence of intellectual capital on financial distress

To enhance the VAIC model, Nadeem et al. (2019) introduced an adjusted Value-Added Intellectual Coefficient (A-VAIC) model. A key modification in the A-VAIC model involves substituting structural capital with innovation capital derived from research and development (R&D) expenditure. In their study on the Adjusted VAIC, they identified a significant positive correlation between their refined measurement of intellectual capital (including human capital efficiency, innovation capital, and capital employed efficiency) and firm performance. This discovery indicates that the A-VAIC method effectively measures intellectual capital (Fashhan & Fitriana, 2018). Companies with efficient management employing such methods can contribute to economic and social growth in a knowledge-based economy. According to research by Pradana & Chalid (2023), the Zscore model outperforms hazard and market-based models in predicting the risk of financial distress.

H3: Intellectual capital has a positive effect on financial distress in the Building Construction sector industry

Figure 2. Research framework



Source: Developed by the authors (2023)

RESULT AND DISCUSSION

Descriptive statistics

Descriptive analysis is utilized to present an overview of the research data, encompassing key statistical measures such as the mean, maximum, and minimum values for variables including Zscore, ROA, DAR, and VAIC. The outcomes of the descriptive analysis are summarized as follows:

Table 1. Descriptive statistics of research variables

	ZSCORE	ROA	DAR	VAIC
Mean	3.449	0.559	0.581	7.500
Median	2.872	0.507	0.595	4.693
Maximum	18.207	1.497	0.973	67.894
Minimum	-4.982	0.077	0.183	-5.379
Std. Dev.	3.490	0.287	0.167	10.044
Observations	96	96	96	96

Source: Processed data with Eviews 10 (2023)

Table 1 presents information, indicating 60 observations for each variable. The average Zscore for Building Construction sub-sector companies is 3.449, with a minimum value of -4.982 and a maximum of 18.207. Negative values suggest that certain companies may face a higher risk of financial distress compared to others.

Moreover, ROA serves as an indicator to measure a company's profitability from its operations. The average ROA for companies in the Building Construction sub-sector is approximately 0.559, with a minimum value of 0.077 and a maximum of 1.497. This value highlights variations in profitability levels among companies in this sub-sector.

DAR is a measure illustrating the proportion of debt a company utilizes to fund its operations. The average DAR is approximately 0.581, with a minimum value of 0.183 and a maximum value of 0.973. Variances in DAR values indicate differences in debt levels among companies in this sub-sector. A high level of leverage can increase the risk of financial distress.

VAIC measures the level of intellectual capital owned by a company, encompassing elements such as knowledge, technology, and innovation. The average VAIC is around 7.500, with a minimum value of -5.379 and a maximum value of 67.894. A higher value indicates the potential competitive advantage a company holds through effective management of its intellectual capital.

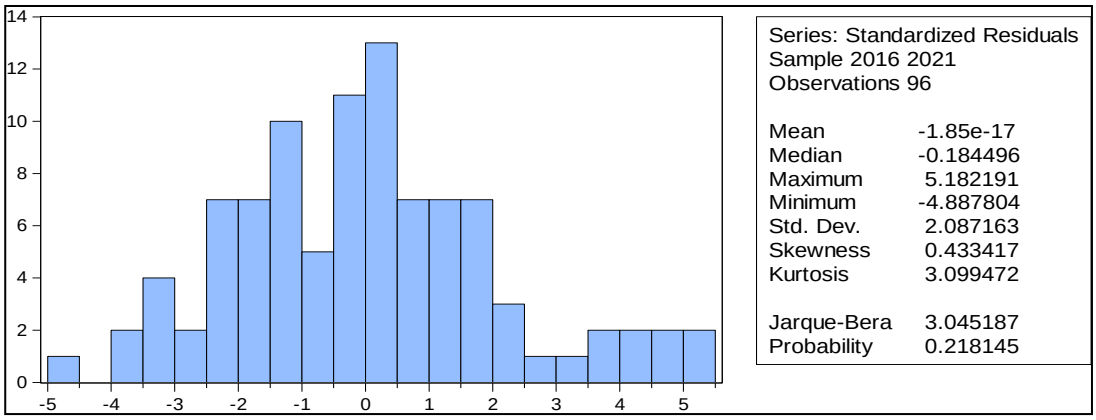
Classical assumption test

Normality test

The purpose of this test is to examine whether there is normal distribution within the regression model between the dependent and independent variables. Data are considered normal if the significance value is more significant than 0.05.

Based on the test results presented in figure 3, it can be concluded that the data follow a normal distribution. This can be observed from the significance value being more significant than 0.05, specifically (0.218 > 0.05).

Figure 3. Normality test result



Source: Processed data with Eviews 10 (2023)

Multicollinearity test

The purpose of this multicollinearity test is to determine whether there is a high or perfect correlation among independent variable within the regression model.

Table 2. Multicollinearity test result

	ZSCORE	ROA	DAR	VAIC
ZSCORE	1			
ROA	0.317	1		
DAR	-0.624	-0.311	1	
VAIC	0.004	-0.013	0.181	1

Source: Processed data with Eviews 10 (2023)

Based on the test results presented in Table 2, which conducted a multicollinearity test by measuring the correlation coefficient between the independent variables (Zscore, ROA, DAR, and VAIC), it was observed that there are varying levels of correlation among these variables. Overall, the results indicate that the relationships between the independent variables are relatively low, with correlation coefficients below 0.6 for all pairs of variables. This suggests that there is no substantial relationship between these variables and no indication of significant multicollinearity in the multiple linear regression analysis.

Heteroscedasticity test

The quality of a regression model is assessed by the presence or absence of heteroscedasticity. In this study, the Glejser test was employed, and with a significance score of less than 5% (0.05), indicating that heteroscedasticity was not detected.

Table 3. Heteroscedasticity test result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.0285	0.3533	0.0806	0.9360
DAR	-1.7553	0.9384	-1.8706	0.0652
VAIC	-0.0130	0.0156	-0.8317	0.4081
C	2.3596	0.6141	3.8426	0.0002

Processed data with Eviews 10 (2023)

According to the results of the heteroscedasticity test presented in Table 3, it is evident that the dependent variable, namely the level of financial distress (Zscore), exhibits no heteroscedasticity. The probabilities are higher than α (0.05), specifically ROA (0.9360 > 0.05), DAR (0.0652 > 0.05), and VAIC (0.4081 > 0.05). Based on these findings, it is concluded that the heteroscedasticity problem was not identified in this dataset.

Autocorrelation test

We employed the LM test and Durbin-Watson statistic to assess autocorrelation. If the F-count is greater than 0.05 and the Durbin-Watson statistic is within the range of (4-dU) to (dU), it indicates the absence of autocorrelation.

Table 4. Autocorrelation test result

R-squared	0.8576	Mean dependent var	7.5618
Adjusted R2	0.8244	S.D. dependent var	6.7245
S.E. of regression	2.3183	Sum squared resid	413.8437
F-statistic	25.7730	Durbin-Watson stat	1.7548
Prob(F-statistic)	0.0000		

Processed data with Eviews 10 (2023)

The autocorrelation test results reveal that the Durbin-Watson value is 1.7548, indicating the absence of autocorrelation.

Regression analysis

Regression analysis is employed to examine and model the relationships or effects between a dependent variable and multiple independent variables.

Table 5. Regression analysis result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	2.591	0.636	4.075	0.000
DAR	-14.844	1.840	-8.067	0.000
VAIC	-0.001	0.021	-0.029	0.977
C	10.625	1.234	8.611	0.000
Prob	0.000			
R2	0.857			
FEM/Chow	0.000			

Source: Processed data with Eviews 10 (2023)

Based on the test results presented in Table 5, it can be concluded that the variables profitability (ROA) and leverage (DAR) have a statistically significant effect on the level of financial distress, as measured by Zscore. The results indicate that the ROA regression coefficient has a positive value of 2.591, while the DAR regression coefficient has a very large negative value of -14.844. The probability value (Prob) obtained for these two variables is 0.000 with a confidence level of 95%. This suggests that industries with high levels of profitability tend to experience lower levels of financial distress, whereas companies with high levels of leverage tend to face higher levels of financial distress.

On the other hand, intellectual capital (VAIC) did not have a significant effect on the level of financial distress, with a regression coefficient value close to zero (-0.001) and a probability

value of 0.977. This indicates that industries with higher or lower levels of intellectual capital do not significantly affect the level of financial distress in the company. Overall, the regression model successfully explained the variation in the level of financial distress, with an R-squared (R2) of 0.857, showing that about 85.7% of the variation in the level of financial distress can be explained by the independent variables in this model.

In addition, the Chow test also demonstrated significant gains with a probability value of 0.000, affirming that the Fixed Effect Model regression model was selected as the appropriate and valid model for analyzing the level of financial distress in Building Construction Sub-Sector companies on the Indonesia Stock Exchange (IDX) from 2016 to 2021.

Discussion

The effect of ROA on financial distress

Based on the processed data obtained, the results indicate that the Return on Assets (ROA) has a positive and significant value of 0.000, which is smaller than 0.05, with a calculated t-value of 4.075. This implies that the hypothesis (H1) has been accepted, concluding that Return on Assets has a significant positive effect on financial distress in the Building Construction Sector Industry during the period 2016-2021. These findings support the notion that industries with higher levels of profitability tend to experience lower levels of financial distress, and vice versa. This aligns with expectations, as industries capable of earning higher profits from their assets will have more resources to address financial obligations.

High profitability suggests that the industry possesses strong financial capacity, generating sufficient profits to meet financial obligations and navigate potential financial challenges (Kalantonis et al., 2021). Consequently, companies with high ROA are likely to be more financially stable and better equipped to confront crises or financial difficulties compared to those with low ROA. These results underscore the positive role of profitability in mitigating the risk of financial distress and emphasize the importance of efficient management in handling assets and generating profits to sustain the company's financial health (Habib & Kayani, 2022).

The effect of DAR on financial distress

Based on the processed data obtained, the results indicate that the Debt to Asset Ratio (DAR) has a negative and significant value of 0.000, which is smaller than 0.05, with a calculated t-value of -8.067. This implies that the hypothesis (H2) has been accepted, concluding that Debt to Asset Ratio has a significant negative effect on financial distress in the Building Construction Sector Industry during the period 2016-2021.

When a company is in debt, it is obligated to pay interest and principal on the loan. In challenging conditions, where the company's profits continue to decline or even suffer continuous losses, the company may struggle to meet its debt obligations, increasing the likelihood of financial distress (Rahma, 2020). Companies relying heavily on debt face the risk of payment difficulties in the future, especially if their debt surpasses their generated returns. If not managed properly, this situation can escalate the potential for financial distress (Septiani & Dana, 2019). A high debt ratio indicates that the industry has a significant level of debt compared to its assets, potentially leading to challenges in meeting debt payment obligations during financial pressure (Kalash, 2023). Therefore, companies with a low debt ratio are more likely to be financially secure and better equipped to navigate the risk of financial distress due to lower debt obligations and greater flexibility in managing the company's finances.

These results underscore the importance of prudent financial management in handling a company's capital structure to mitigate the risk of financial distress, which has the potential to harm the company.

The effect of VAIC on financial distress

Based on the processed data obtained, the results indicate that the Value-Added Intellectual Coefficient (VAIC) does not have a significant value of 0.977, which is greater than 0.05, with a calculated t-value of -0.029. This implies that the hypothesis (H3) has been accepted, concluding that Intellectual Capital does not have a significant effect on financial distress in the Building Construction Sector Industry during the period 2016-2021.

The findings related to the relationship between the variables, human capital efficiency and capital employed efficiency, both showing a significant effect on the company's financial distress risk, align with previous research conducted by (Cenciarelli et al., 2018; Shahwan & Habib, 2020). However, the variable of innovation capital efficiency, which does not exhibit a significant effect on the company, contradicts the research conducted by (Nadeem et al., 2019). Although VAIC can provide an overview of the efficiency and productivity of a company's intellectual capital, the results suggest that this factor is not the primary determinant in dealing with potential financial problems or the risk of financial distress (Kartikasari & Hadiprajitno, 2014).

This emphasizes that, in facing situations of financial crises or difficulties, companies need to focus more on other factors such as profitability, capital structure, and risk management to mitigate and overcome the risk of financial distress. The low disclosure of intellectual capital (ROGIC) and the absence of standards to disclose and measure ROGIC in Indonesia (Pratiwi & Sudarso, 2017) might also contribute to the non-significant effect observed in this study.

CONCLUSION

This study aims to analyze the influence of profitability (ROA), leverage (DAR), and intellectual capital (VAIC) on financial distress in Building Construction Sub-Sector companies during the period 2016-2021. The research findings indicate that profitability (ROA) and leverage (DAR) have a significant impact on financial distress in Building Construction sub-sector companies. This suggests that industries with higher levels of profitability tend to experience lower levels of financial distress, while companies with higher levels of leverage exhibit lower levels of financial distress. However, intellectual capital (VAIC) does not have a significant effect on financial distress in the Building Construction Sector Industry. The results of this analysis provide crucial insights for company management and stakeholders to effectively manage profitability and debt levels, thereby reducing the company's financial risk.

Management in the Building Construction Sub-Sector is expected to concentrate on strategies and tactics aimed at enhancing company profitability. Initiatives to boost operational efficiency, optimize asset utilization, and enhance the effectiveness of marketing strategies can contribute to increasing the company's level of profitability. Given that the level of leverage (DAR) significantly influences the level of financial distress, company management is expected to adeptly manage debt. Companies should consider appropriate financing options, monitor the manageable level of debt, and proactively manage financial risks to avoid potential financial distress.

For future research, it is recommended to include additional variables related to this study, such as sales growth, company value, and other financial performance indicators. Additionally, expanding the sample size to encompass property and real estate companies and extending the research period would enhance the generalizability of the research findings. However, it is essential to acknowledge the limitations of this study, including the restricted set of variables used and the narrow sample scope, focusing solely on Building Construction Sub-Sector companies during the 2016-2021 research period.

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