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THE INFLUENCE OF FINANCIAL DISTRESS, LEVERAGE, AND FIRM SIZE ON STOCK RETURNS IN THE INFRASTRUCTURE INDUSTRY SECTOR ON THE INDONESIA STOCK EXCHANGE

PENGARUH KESULITAN KEUANGAN, LEVERAGE, DAN UKURAN PERUSAHAAN TERHADAP KEMBALIAN SAHAM DI SEKTOR INDUSTRI INFRASTRUKTUR DI BURSA EFEK INDONESIA

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ABSTRACT

This study aims to examine the extent of the influence of financial distress, leverage, and firm size on stock returns of companies in the infrastructure industry sector listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. The study employs an explanatory quantitative approach with panel data regression analysis using the Pooled Least Squares (PLS) method. From a total population of 69 companies, 30 companies were selected as the sample using purposive sampling, resulting in 150 observations. Financial distress factors were measured using the Altman Emerging Market Scoring (EMS) approach, leverage was measured by the Debt to Equity Ratio (DER), and firm size was determined by total assets. The results indicate that, partially, only the OPTA variable has a positive and significant effect on stock returns. Meanwhile, WCTA, RETA, BVTL, DER, and firm size do not have a significant effect. Simultaneous testing shows that financial distress, leverage, and firm size collectively have a significant effect on stock returns with a significance level of 0.001. The coefficient of determination (R^2) explains only 15% of the variation in stock returns in the infrastructure industry sector, while the remaining 85% is influenced by factors outside the research model.
***Keywords**: Financial Distress, Firm Size, Infrastructure Sector, Leverage, Stock Returns.*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis sejauh mana pengaruh kesulitan keuangan, leverage, dan ukuran perusahaan terhadap pengembalian saham perusahaan di sektor industri infrastruktur yang terdaftar di Bursa Efek Indonesia (BEI) selama periode 2020–2024. Penelitian ini menggunakan pendekatan kuantitatif eksplanatori dengan analisis regresi data panel menggunakan metode Pooled Least Squares (PLS). Dari populasi total 69 perusahaan, 30 perusahaan dipilih sebagai sampel menggunakan metode sampling purposif, menghasilkan 150 observasi. Faktor kesulitan keuangan diukur menggunakan pendekatan Altman Emerging Market Scoring (EMS), leverage diukur dengan rasio utang terhadap ekuitas (DER), dan ukuran perusahaan ditentukan berdasarkan total aset. Hasil menunjukkan bahwa, secara parsial, hanya variabel OPTA yang memiliki pengaruh positif dan signifikan terhadap pengembalian saham. Sementara itu, WCTA, RETA, BVTL, DER, dan ukuran perusahaan tidak memiliki efek yang signifikan. Uji simultan menunjukkan bahwa kesulitan keuangan, leverage, dan ukuran perusahaan secara kolektif memiliki efek signifikan terhadap pengembalian saham dengan tingkat signifikansi 0,001. Koefisien determinasi (R^2) hanya menjelaskan 15% variasi pengembalian saham di sektor infrastruktur, sementara 85% sisanya dipengaruhi oleh faktor di luar model penelitian.
Kata Kunci: Kesulitan Keuangan, Ukuran Perusahaan, Sektor Infrastruktur, Leverage, Pengembalian Saham

INTRODUCTION

The infrastructure sector is one of the key pillars in a country's economic development. According to the Ministry of Public Works and Housing (PUPR) in 2022, the infrastructure sector plays a significant role in the development of a region, especially the existence of infrastructure, both in terms of quality and quantity, which affects other dimensions of development, such as the Human Development Index (HDI), regional accessibility, economic growth, and international competitiveness. However, this sector is also faced with various challenges, including financial

risks and financial distress, which can have a significant impact on the stability of companies and the capital market (Muklis, 2016).

Financial distress is one of the threats to shareholders in the capital market in obtaining maximum returns. Financial distress is a condition where a company is unable to meet or is experiencing significant difficulties in fulfilling its financial obligations, such as debt and interest payments. This condition can be caused by various factors, including inefficient management, high debt burden, macroeconomic changes, and a sharp decline in income (Ross et al., 2019). Companies experiencing financial distress tend to lose investor confidence, which ultimately affects the company's stock price in the capital market (Hasan & Juwita, 2019).

The condition of financial distress in the infrastructure industry sector became an interesting issue after the financial condition of several infrastructure industries in state-owned enterprises (SOEs) was widely discussed. One of them is PT Waskita Karya Tbk, where in the 2023 financial report, the company's total liabilities reached IDR 83.9 trillion compared to its equity of only IDR 11.6 trillion. This means that PT Waskita Karya Tbk has a Debt to Equity Ratio of 7.23x, the highest in the construction sub-sector of the infrastructure industry on the Indonesia Stock Exchange, compared to other similar industries that have a Debt to Equity Ratio of only 1.67x (BEI, 2023).

In their study, Sareen & Sharma (2022) revealed that the implications of financial distress would affect the fluctuations in the company's stock price in the capital market. Stock price fluctuations are a reflection of the market's perception of the company's performance and prospects. Furthermore, stock prices are also an important factor that must be considered by an investor when making an investment because stock prices indicate the company's performance (Lestari et al., 2016).

In the infrastructure sector, stock returns can be more volatile because infrastructure projects are usually long-term and require large capital investments. When infrastructure companies experience financial distress, uncertainty about the company's ability to complete projects and meet financial obligations can lead to significant stock price volatility (Chan, 2022).

Several previous studies have examined the relationship between financial distress and stock prices in various industry sectors. Altman & Hotchkiss (2006) developed the Z-Score model to predict company bankruptcy, showing that financial distress indicators have a significant impact on company stability. Another study by Chan et al. (2022) found that financial distress negatively affects company value, especially in industries that require large capital, such as infrastructure.

A study by Sareen & Sharma (2022) on the assessment of financial distress and stock price projections in the automotive sector in India also used the Altman Z-Score model to assess financial distress with five related financial ratios. The results of the study showed that financial distress affects stock price fluctuations in the Indian automotive sector, with the financial distress ratios that had the most influence being the Earnings Before Interest and Tax to Total Asset Ratio and the Market Value to Total Liability Ratio.

Meanwhile, a study in the Indonesian stock market, in the

chemical industry subsector, using the Altman Z-Score model found that financial distress, particularly the Earnings Before Interest and Tax to Total Asset Ratio, also significantly influenced stock prices. However, another variable, the Book Value of Equity to Book Value of Total Asset, did not significantly affect stock prices in the chemical industry subsector (Lestari et al., 2016).

Another study by Renwarin (2017) found that financial distress did not have a significant effect on stock returns in the non-foreign exchange banking sector in Indonesia. Financial distress with the variables of debt to assets ratio, return on assets, operational expenses to operational income (BOPO), and loan to deposit ratio only influenced 47.9% of stock returns in the non-foreign exchange banking sector.

In addition to financial distress, leverage or solvency ratio is also often used as an indicator of its influence on stock returns. According to Pradanimas & Sucipto (2022), leverage, which is measured using the total debt value compared to equity, has a negative and significant effect on stock prices. This indicates that the more a company borrows, the more interest costs and bankruptcy risks arise. A high leverage ratio, if continued, will lead the company to become trapped in extreme leverage, which will ultimately decrease investor interest and affect stock returns.

Financial leverage or the use of debt is a crucial instrument in the company's capital structure. This is in line with decisions about how much debt a company takes on. The company's leverage decisions are also intended to maximize the company's value, which ultimately provides value to each investor or shareholder. However, debt usage is often referred to as a "double-edged sword," as on one hand, it can increase the potential for profit, but on the other hand, it can lead to the risk of default if cash flow is insufficient to meet interest and principal payments (Andersson, 2016).

Firm size, or company size, measured by total assets, is also often used in many asset pricing models to predict stock returns (Astakhov et al., 2019). Large companies usually have better business continuity, indicating good performance. A company with good performance will generate profits and distribute dividends to shareholders, thus attracting investor interest in the company. Meanwhile, small companies tend to use their profits for business expansion rather than distributing dividends.

In their study, Fathinah & Setiawan (2021) revealed that firm size in the consumer goods sector has a significant positive effect on stock prices. Large companies tend to have high collateral assets, reducing the risk of bankruptcy and attracting investor interest to buy the company's shares. This makes investors interested in buying the company's shares, thereby increasing stock demand and driving stock prices higher.

RESEARCH METHODS

Research Type

This research is an explanatory quantitative study with an associative approach. According to Umar (2021), quantitative research is grounded in positivist philosophy and uses statistical analysis to test hypotheses by collecting data from a population or sample using specific instruments. The associative approach is used to explore relationships between variables, particularly how factors like financial distress, leverage, and firm size influence stock returns in the

infrastructure sector of the Indonesia Stock Exchange (IDX).

Sampling

A purposive sampling technique is used to select 30 companies that meet specific criteria, such as being listed continuously from 2020 to 2024, having complete financial reports, and not being delisted or suspended during the research period. This method ensures that the sample is representative of the target population.

Data Collection Method

Secondary data is collected from publicly available sources such as the IDX website, Yahoo Finance, and company websites. The data includes annual financial reports and historical stock prices.

Data Analysis Method

Descriptive statistics are used to summarize data, while classical assumption tests (normality, multicollinearity, autocorrelation, and heteroscedasticity) are conducted before hypothesis testing. The panel data regression model is used to analyze the impact of financial distress, leverage, and firm size on stock returns.

Classical Assumption Tests

1. Normality Test: Kolmogorov-Smirnov (K-S) is used to determine if the data follows a normal distribution (Sugiyono, 2017).
2. Multicollinearity Test: Variance Inflation Factor (VIF) and Tolerance are used to check for high correlation among independent variables.
3. Autocorrelation Test: Durbin-Watson (DW) test identifies any correlation between residuals over time.
4. Heteroscedasticity Test: A Park test for heteroscedasticity checks if residual variances differ across observations.

Hypothesis Testing

1. Panel Data Regression: Gujarati (2003) explains the regression model to analyze relationships between variables.
2. Chow Test: Determines whether Fixed Effects or Pooled Least Squares is more appropriate for the regression model.
3. Hausman Test: Decides between Fixed Effects and Random Effects models.
4. Breusch-Pagan LM Test: Checks for individual effects in the regression model.
5. t-test and F-test: Evaluate the significance of independent variables and the overall model respectively.
6. R^2 Test: Measures how well the independent variables explain the variance in stock returns.

LITERATURE REVIEW

Capital Market

In Indonesia, the capital market is regulated under Law Number 4 of 2023 on the Development and Strengthening of the Financial Sector. It encompasses activities such as public offerings, securities transactions, investment management, and the regulation of issuers and public companies. The Financial Services Authority (OJK) supervises market operations through its regulations, including POJK Number 3/POJK.04/2021. The Indonesian Stock Exchange (IDX) regulates transactions and classifies industries through the IDX-Industrial Classification (IDX-IC), which includes 12 sectors, 35 sub-sectors, 69 industries, and 130 sub-industries, with infrastructure being one of the 12 sectors (OJK, 2021).

Shares

Equity in a corporation typically consists of shares, each carrying identical value and rights. Shares,

including common and preferred shares, grant rights such as profit distribution, voting, and preemptive rights. Preferred shares offer prioritized dividend claims but forgo some of the standard rights of common shareholders (Kieso et al., 2020). The free transferability of shares allows ownership mobility, and the company keeps a shareholder registry for administrative purposes, including dividend payments and voting rights (Kieso et al., 2020).

Stock Return

Stock return can be evaluated using two primary methods: arithmetic and geometric average returns. Arithmetic average return is used for short-term analysis and reflects the expected return over a short horizon, while geometric average return accounts for compounding effects and is more relevant for long-term investment planning (Ross et al., 2019). Both methods provide distinct insights, with arithmetic return being more suitable for short-term forecasting, and geometric return for long-term projections.

Signaling Theory

Signaling Theory, introduced by Spence (1973) and later expanded by Ross (1977), suggests that information asymmetry exists between managers and investors. Managers possess more information about a company's value and prospects, which influences corporate decisions and market signals. This theory has been applied to capital structure and bankruptcy, showing that financial distress can signal poor management or weak prospects, thus affecting stock prices (Kurniasih et al., 2022; Fachrudin & Ihsan, 2021).

Efficient Mrket Hypothesis

The Efficient Market Hypothesis (EMH) posits that stock prices fully reflect all available information, making it impossible for investors to consistently achieve abnormal returns. Fama (1970) identified three forms of market efficiency: weak, semi-strong, and strong, depending on the types of information reflected in stock prices. In an efficient market, the price of securities adjusts rapidly to new information, ensuring that investments yield only normal returns, as the market values securities accurately (Ross et al., 2019).

Capital Structure & Bankruptcy Theory

Capital Structure Theory suggests that companies should use debt up to the point where the tax benefits of additional debt equal the increased financial distress risks. Beyond this optimal capital structure, further debt increases the risk of bankruptcy and reduces company value (Ross et al., 2019). Bankruptcy theory, particularly Altman & Hotchkiss (2006), identifies financial distress through specific financial ratios, allowing for the prediction of bankruptcy risks through models like the Altman Z-score.

Pecking Order Hypothesis

The Pecking Order Hypothesis argues that companies prioritize internal financing over external debt or equity due to information asymmetry between managers and investors. Companies will issue debt before equity to avoid signaling financial distress to the market, as issuing new equity may negatively affect stock prices (Brealey et al., 2011). This approach reflects the preference for less risky, less visible financing options before resorting to equity issuance.

Agency Theory

Agency Theory addresses the conflict of interest between principals (shareholders) and agents (managers). It highlights the need for contracts, incentives, and monitoring mechanisms to align their interests. Agency costs, arising from this conflict, include both direct costs like monitoring and indirect costs like lost opportunities. These costs also emerge in financing decisions, especially when a company faces financial distress (Scott, 2015; Ross et al., 2019).

Financial Distress

Financial distress occurs when a company is unable to meet its financial obligations, often caused by inefficient management, high debt, or sharp revenue declines. This condition can affect stock prices, especially in volatile sectors like infrastructure, where large capital investments and long-term projects increase uncertainty (Ross et al., 2019; Chan et al., 2022). Models like Altman's Z-score use financial ratios to predict distress and bankruptcy risk (Altman & Hotchkiss, 2006).

Leverage

Leverage refers to using debt to finance a company's assets to increase returns for investors. While leverage can amplify profits, it also brings financial risk, as the company must repay its debt even during operational downturns. The debt-to-equity ratio is commonly used to measure leverage, with higher ratios indicating higher financial risk (Ross et al., 2019; Brigham & Houston, 2009). Proper debt management is crucial to balancing risk and return for shareholders.

Firm Size

Firm size, typically measured by total assets or market capitalization, reflects a company's ability to withstand financial challenges and its potential for generating stable returns. Larger firms tend to be more stable with lower bankruptcy risk, and they attract more investor interest due to their operational scale and financial strength (Brigham & Houston, 2009; Suciati, 2018). This stability often results in larger firms offering better stock returns.

RESULTS AND DISCUSSION

Analysis

Table 1. List of Sample Companies in the Infrastructure Industry Sector

No	Stock Code	Employee Name
1	ADHI	PT Adhi Karya (Persero) Tbk (XIDX:ADHI)
2	BALI	PT Bali Towerindo Sentra Tbk (XIDX:BALI)
3	BUKK	PT Bukaka Teknik Utama Tbk (XIDX:BUKK)
4	CASS	PT Cahaya Aero Services Tbk (XIDX:CASS)
5	CMNP	PT Citra Marga Nusaphala Persada Tbk (XIDX:CMNP)
6	EXCL	PT XLSMART Telecom Sejahtera Tbk (XIDX:EXCL)
7	GHON	PT Gihon Telekomunikasi Indonesia Tbk (XIDX:GHON)
8	GOLD	PT Visi Telekomunikasi Infrastruktur Tbk (XIDX:GOLD)
9	IDPR	PT Indonesia Pondasi Raya Tbk (XIDX:IDPR)
10	IPCC	PT Indonesia Kendaraan Terminal Tbk (XIDX:IPCC)
11	IPCM	PT Jasa Armada Indonesia Tbk (XIDX:IPCM)
12	ISAT	PT Indosat Tbk (XIDX:ISAT)
13	JKON	PT Jaya Konstruksi Manggala Pratama Tbk (XIDX:JKON)
14	JSMR	PT Jasa Marga (Persero) Tbk (XIDX:JSMR)

15	KEEN	PT KENCANA ENERGI LESTARI TBK (XIDX:KEEN)
16	LCKM	PT LCK GLOBAL KEDATON Tbk (XIDX:LCKM)
17	LINK	PT Link Net Tbk (XIDX:LINK)
18	MPOW	PT MegaPower Makmur Tbk (XIDX:MPOW)
19	NRCA	PT Nusa Raya Cipta Tbk (XIDX:NRCA)
20	PORT	PT Nusantara Pelabuhan Handal Tbk (XIDX:PORT)
21	POWR	PT Cikarang Listrindo Tbk (XIDX:POWR)
22	PPRE	PT PP Presisi Tbk. (XIDX:PPRE)
23	PTPP	PT Pembangunan Perumahan (Persero) Tbk (XIDX:PTPP)
24	PTPW	PT PRATAMA WIDYA Tbk (XIDX:PTPW)
25	SSIA	PT Surya Semesta Internusa Tbk (XIDX:SSIA)
26	TBIG	PT Tower Bersama Infrastructure Tbk (XIDX:TBIG)
27	TLKM	PT Telkom Indonesia (Persero) Tbk (XIDX:TLKM)
28	TOTL	PT Total Bangun Persada Tbk (XIDX:TOTL)
29	TOWR	PT Sarana Menara Nusantara Tbk (XIDX:TOWR)
30	WEGE	PT Wijaya Karya Bangunan Gedung Tbk (XIDX:WEGE)

Source: *website idx.co.id*

The company data used in this study consist of firms in the infrastructure industry sector that have been listed on the Indonesia Stock Exchange during the period 2020 to 2024. The research employs secondary data, including annual financial statements, financial ratios, and monthly stock prices, which are subsequently analyzed using panel data regression models. The data sources are obtained from the official platform or website of the Indonesia Stock Exchange (www.idx.ac.id), as well as investing.com, finance.yahoo.com, and the official websites of the respective companies. The infrastructure sector is one of the 12 IDX-Industrial Classification (IDX-IC) sectors and comprises seven sub-sectors, namely transport infrastructure operators, heavy constructions and civil engineering, telecommunication services, wireless telecommunication services, electric utilities, gas utilities, and water utilities.

Hypothesis Testing Results

Hypothesis testing was conducted using panel data regression analysis. However, before performing the panel data regression test, a series of tests were first carried out to determine the most appropriate regression model in accordance with the characteristics of the data. These tests are described as follows:

Chow Test

The Chow Test is a method used to determine the most appropriate panel regression model between the Pooled Least Squares (PLS) model and the Fixed Effect Model (FEM) (Greene, 2008). This test is conducted to determine whether there are significant differences in the intercepts across entities in the panel dataset. If the Chow test results indicate that the intercepts differ significantly with a p-value of less than < 0.05, then the FEM is considered more appropriate. Conversely, if the p-value is greater than > 0.05, then the PLS model is deemed more suitable.

Based on the Chow test, the following results were obtained as presented in Table 2:

Table 2. Results of the Chow Test Analysis

Chow Test	Statistic	d.f.	Prob.
Cross-section F	1.019410	(29,114)	0.4508
Cross-section Chi-square	34.586221	29	0.2184

Source: Data processed from the Chow test using EViews 12

Based on the Chow test results in Table 2, the Cross-section Chi-square probability value is 0.2184. Therefore, since the p-value is greater than > 0.05, the Pooled Least Squares (PLS) regression model is more appropriate for use.

Hausman Test

The Hausman Test is a method used to determine the most appropriate panel regression model between the Fixed Effect Model (FEM) and the Random Effect Model (REM) (Greene, 2008). This test aims to identify whether the intercepts of each company are correlated with the independent variables. The decision criteria for the Hausman test are as follows: if the p-value is less than < 0.05, then the FEM is selected; if the p-value is greater than > 0.05, then the REM is considered more appropriate.

Based on the Hausman test, the following results were obtained as shown in Table 3:

Table 3 Results of the Hausman Test Analysis

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.050279	6	0.5374

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var (Diff.)	Prob.
WCTA	0.358154	-0.086220	0.113674	0.1875
RETA	-0.749081	-0.318777	0.531283	0.5550
OPTA	2.578873	2.313786	0.312786	0.6355
BVTL	0.020389	0.009067	0.000466	0.6001
DER	0.049651	0.008218	0.003521	0.4850
LNFS	0.189025	-0.023087	0.024292	0.1735

Source: Data processed from the Hausman test using EViews 12

Based on the Hausman test results in Table 3, the Cross-section random probability value is 0.5374. Since the p-value is greater than > 0.05, the Random Effect Model (REM) is more appropriate. The next step is to determine whether the Pooled Least Squares (PLS) or Random Effect Model (REM) should be used.

Breusch–Pagan Lagrange Multiplier Test

The Breusch–Pagan Lagrange Multiplier (LM) Test is a method used to determine the most appropriate panel regression model between the Random Effect Model (REM) and the Pooled Least Squares (PLS) model. The Breusch–Pagan test aims to determine whether there are significant individual effects or heterogeneity among

companies in the regression model (Gujarati, 2003). The decision criteria are as follows: if the p-value is less than < 0.05, the REM is preferred; if the p-value is greater than > 0.05, the PLS model is more appropriate.

Based on the Breusch–Pagan LM test, the following results were obtained as presented in Table 4:

Table 4. Results of the Breusch–Pagan Lagrange Multiplier (LM) Test Analysis

Test	Cross-section	Time	Both
Breusch-Pagan	0.300779 (0.5834)	0.200310 (0.6545)	0.501089 (0.4790)
Honda	-0.548433 (0.7083)	-0.447560 (0.6728)	-0.704274 (0.7594)
King-Wu	-0.548433 (0.7083)	-0.447560 (0.6728)	-0.610499 (0.7292)
Standardized Honda	0.123832 (0.4507)	-0.182569 (0.5724)	-4.745193 (1.0000)
Standardized King-Wu	0.123832 (0.4507)	-0.182569 (0.5724)	-3.483510 (0.9998)
Gourieroux et al.	–	–	0.000000 (1.0000)

Source: Data processed from the Breusch–Pagan LM test using EViews 12

The Breusch–Pagan LM test results in Table 4 show that the Breusch–Pagan p-value is 0.4790. Since this value is greater than > 0.05, the appropriate regression model is the Pooled Least Squares (PLS). Therefore, after conducting the Chow test, Hausman test, and Breusch–Pagan LM test, the selected regression model is the Pooled Least Squares (PLS) model.

Panel Data Regression Analysis

Panel data regression is a statistical analysis method used to assess the influence of two or more independent variables on a dependent variable using panel data (Gujarati, 2003). Based on the results of the Chow test, Hausman test, and Breusch–Pagan test, the selected regression model is Pooled Least Squares (PLS). The Pooled Ordinary Least Squares (OLS) model combines all observations into a single regression model.

The regression results using stock returns as the dependent variable and financial distress factors, leverage, and firm size as independent variables are presented in Tables 5 and 6.

Table 5. Results of the Pooled Least Squares (PLS) Regression Analysis

Model	Unstandardized Coeff. (B)	Std. Error	Standardized Coeff. (Beta)	t	Sig.
(Constant)	0.058	0.168	–	0.348	0.729
WCTA	-0.091	0.133	-0.068	-0.685	0.495
RETA	-0.315	0.253	-0.121	-1.244	0.215
OPTA	2.307	0.486	0.411	4.751	0.000005
BVTL	0.009	0.010	0.093	0.907	0.366
DER	0.008	0.036	0.028	0.229	0.819
LNFS	-0.023	0.020	-0.135	-1.163	0.247

Source: Data processed from Pooled Least Squares (PLS) regression using IBM SPSS Statistics

Based on the regression results in Table 5, the regression equation describing the influence of financial distress factors, leverage, and firm size on stock returns in the infrastructure sector on the Indonesia Stock Exchange is formulated as follows:

Notes:

a. i = company

b. t = period

c. X1 = Working Capital to Total Assets (WCTA)

d. X2 = Retained Earnings to Total Assets (RETA)

e. X3 = Operating Income to Total Assets (OPTA)

f. X4 = Book Value of Equity to Total Liabilities (BVTL)

g. X5 = Debt to Equity Ratio (DER)
h. X6 = ln(Total Assets) (LNFS)
i. ε = residual

t-Test

The t-test examines whether an individual independent variable has a significant contribution to changes in the dependent variable while other variables are held constant. Based on Table 4.10, only one independent variable has a significant effect on stock returns, namely operating profit to total assets, with a significance value < 0.05. Meanwhile, five independent variables do not have a significant effect on stock returns, as their significance values are > 0.05. These variables are working capital to total assets, retained earnings to total assets, book value of equity to total liabilities, debt to equity ratio, and total assets.

F-Test

The F-test is used to determine whether all independent variables in the regression model simultaneously have a significant effect on the dependent variable. The results of the F-test for financial distress factors, leverage, and firm size as independent variables and stock returns as the dependent variable are presented in Table 6.

Table 6. Results of the F-Test Analysis

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.537	6	0.423	4.196	0.001
Residual	14.411	143	0.101	–	–
Total	16.948	149	–	–	–

Source: Data processed from F-test using IBM SPSS Statistics

Based on Table 6, the Sig. value is < 0.05, indicating that working capital to total assets, retained earnings to total assets, operating profit to total assets, book value of equity to total liabilities, debt to equity ratio, and total assets simultaneously affect stock returns.

R² Test

The R^2 test, or coefficient of determination, measures how much variation in the dependent variable can be explained by the independent variables in the regression model. The R^2 test results are presented in Table 7.

Table 7 Results of the R^2 Test Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.387	0.150	0.114	0.3174505

Source: Data processed from R^2 test using IBM SPSS Statistics

Based on the R^2 test results, variations in the dependent variable, namely stock returns in the infrastructure industry sector, can be explained by the independent variables financial distress factors, leverage, and firm size by 15%. Meanwhile, the remaining 85% is explained by other variables outside the regression model, including working capital to total assets, retained earnings to total assets, operating income to total assets, and book value of equity to total liabilities.

Discussion

The regression results indicate that most financial distress indicators—Working Capital to Total Assets (WCTA), Retained Earnings to Total Assets (RETA), and Book Value of Equity to Total Liabilities (BVTL) as well as leverage measured by the Debt to Equity Ratio (DER) and firm size

measured by total assets, do not have a statistically significant effect on stock returns in the infrastructure industry sector listed on the Indonesia Stock Exchange. WCTA and RETA show negative but insignificant relationships with stock returns, suggesting that short-term liquidity and accumulated past profits are not primary considerations for investors in this capital-intensive sector. Similarly, BVTL and DER exhibit positive yet insignificant effects, reflecting that solvency structure and high leverage common characteristics of infrastructure firms due to long-term, large-scale projects, do not independently drive stock return variations. Firm size also shows a negative and insignificant relationship, indicating that larger asset bases do not necessarily translate into higher stock returns in a mature and highly regulated sector such as infrastructure.

In contrast, Operating Income to Total Assets (OPTA) is the only variable found to have a positive and statistically significant effect on stock returns, highlighting that operational profitability is a key determinant valued by investors. This finding underscores that the market places greater emphasis on a firm's ability to generate operating income from its assets rather than on balance-sheet-based distress or size indicators. Furthermore, the simultaneous F-test confirms that financial distress factors, leverage, and firm size jointly influence stock returns, although the explanatory power of the model remains limited. The R^2 value of 15% suggests that stock returns in the infrastructure sector are largely driven by other factors outside the model, including macroeconomic conditions, interest rates, government infrastructure policies, project risk, market sentiment, and firm-specific operational and non-financial considerations.

CONCLUSSION

1. Based on the results of the Chow test, Hausman test, and Breusch–Pagan LM test, the most appropriate regression model for this study in the infrastructure industry sector is the Pooled Least Squares (PLS) model. The Pooled Least Squares (PLS) model assumes that firm characteristics are relatively homogeneous, so individual effects and time effects are not required.
2. The results of the t-test indicate that not all independent variables, namely financial distress factors, have a significant effect on stock returns in the infrastructure industry sector. The variable that significantly affects stock returns in the infrastructure industry sector is Operating Profit to Total Assets (OPTA). Meanwhile, other variables such as Working Capital to Total Assets (WCTA), Retained Earnings to Total Assets (RETA), and Book Value of Equity to Total Assets (BVTA) do not have a significant effect on stock returns in the infrastructure industry sector.
3. The results of the t-test show that Leverage, measured by the Debt to Equity Ratio (DER), does not have a significant effect on stock returns in the infrastructure industry sector.
4. The results of the t-test show that the Firm Size variable, measured by total assets, is proven not to have a significant effect on stock returns in the infrastructure industry sector.
5. Simultaneously, all independent variables are proven to jointly have a significant effect on stock returns. However, the R^2 value or coefficient of determination of 0.150 indicates that the model's ability to explain variations in stock returns in the

infrastructure industry sector is only 15%, while the remaining 85% is influenced by other factors outside the research model.

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