Factors Affecting Infrastructure, Utilities, And Transportation Stock Price

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Abstract.

The aim of the study was to define the performance of the blue-chips stock price listed at The Indonesia Stock Exchange in particular the stock price of the establishments which organize the energy sectors, infrastructure and transportations. The reason of choosing those particular establishments was due to its fluctuate and price correction frequently. The analysis was done by distributing the related research variables and endorsed the hypothetical factors. The chosen factors then being simulated with statistical analysis instruments. The independent variables such as the inflation rates, interest rates and private investments were simulated to have particular correlation and affecting rate toward the stock price. The findings showed that fundamental variables had no effect on the stock prices of the infrastructure, utilities, and transportation sectors.

Keywords: *Stock Price, Interest rate and inflation rate.*

I. INTRODUCTION

One of the investment instruments was stocks. Before making a stock purchase decision, investors would usually analyze both fundamentally and technically. The analysis was carried out with the hope that investors could get the most optimal profit from their stock portfolio. Fundamental analysis was carried out with a top-down approach starting from analyzing the economy, industrial sector, and company. Meanwhile, technical analysis was carried out by paying attention to historical data which includes price, volume, and interest. Stock investment in Indonesia had developed quite rapidly. There was evidenced by the number of stock transactions in the Indonesia Stock Exchange. The data above shows that the overall value of stock transactions had increased. The development of stock investment was influenced by various things. One of them was the increasing public knowledge about stocks (Chiranjivi & Sensarma, 2023). The improved knowledge could occur considering that currently they had easier access to information with the internet media and the Indonesia Financial Services Authority had begun to increase educational activities regarding investment instruments, especially stocks (Chiranjivi & Sensarma, 2023).People were starting to realize that they would get higher returns if they could anticipate stock risks as well. The Indonesia Stock Exchange implemented an online stock trading system. The presence of online trading makes it easier for investors to conduct stock transactions. Investors could transact anywhere and anytime if they already had a stock account and were connected to an internet connection (Falchetta et al., 2022).

This would encourage an increase in the number of investors and at the same time increase the amount of stock investment (Xu et al., 2022). In the figure above, it could be seen that each investment instrument had a different level of risk and return. The levels of risk and return had a unidirectional relationship, where if an investor wants to invest with the expectation of earning more returns, then he would be faced with high risks as well. The object of this research was the shares of infrastructure, utilities, and transportation companies listed on the Indonesia Stock Exchange. The infrastructure, utilities, and transportation sector was divided into several subsectors such as energy, toll roads, ports, airports, telecommunications, transportation, and non-building construction. They found that there was a negative relationship between the four variables and stock prices in the short run, but not significant. A positive relationship between the four macroeconomic variables and stock prices was significantly found in the long

run (Liu & Nguyen, 2023). The author chose this research object because economic growth in Indonesia was still uneven. This was evidenced by the amount of Gross Domestic Product contribution until now only centered in Java Island, which was 60%. The plan to equalize economic growth outside Java Island must also be supported by the development of infrastructure, utilities, and transportation in Indonesia so that companies engaged in this sector had good prospects in the future.

II. LITERATURE REVIEW

Investment was the purchase of new capital goods. Investment in practice was often equated with saving, even though these two terms had different meanings (Baussola & Carvelli, 2023). The difference lies in the level of risk and the rate of growth of the assets it produces. Investment had a higher risk than saving, considering that the returns obtained from investment were relatively greater (Li et al., 2023). It defined investment as a company's effort to increase wealth by utilizing assets. Investment was a current commitment of money or other resources with the expectation of future profits (Matvejevs & Tkacevs, 2023). By looking at the above definitions, it could be concluded that investment essentially had the same goal, which was to gain wealth in the future by investing capital today (Węgrzynowska et al., 2023). There were three types of investment, namely business fixed investment, presidential investment, and inventory investment (Liu & Nguyen, 2023). Fixed investment was an investment in equipment for production purposes. Residential investment was an investment in housing. While inventory investment was an investment in the form of inventory, semi-finished goods, and finished goods.reveal that investment instruments vary, such as bonds, stocks, property, foreign exchange, stock indices, commodities and others (Xu et al., 2022). Two important terms in investment were risk and return.

Return what investors expect when investing their money (Chiranjivi & Sensarma, 2023). The rate of return was divided into two parts, namely expected return (expected return in the future) and realized return (actual return over several periods in the past). Meanwhile, risk was a factor that causes actual returns to differ from the returns expected by investors. Investment rissk could be divided into systematic and non-systematic risks (Chiranjivi & Sensarma, 2023). Systematic risk was a risk that affects a large number of assets that could not be avoided. An example of systematic rissk was the rissk of uncertainty in the economic situation (GDP and inflation rate). Non-systematic rissks were rissks that affect only a few assets. It was also called specific rissk and examples were liquidity risk and financial risk (Falchetta et al., 2022).Shares could be divided into common stock and preference stock. The main difference between the two types of stocks was the amount of dividends they pay out and the voting rights they had. The function of a stock price index was to track market trends. The stock price index makes it easier for investors to see a summary of stock movements per business day of the exchange and helps investors make investment decisions. As quoted from the idx.co.id webpage, there were at least 11 types of stock price indices that were often used in Indidnesia. All of these indices essentially had the same purpose, but the stocks involved in the calculation of each index were different. The indices were as follows. Composite Stock Price Index Of these stock price indices, the most commonly used is the Composite Stock Price Index (CSPI).

Average method

$$IHSG=\frac{\sum H_t}{\sum H_0} X100\%$$

$\sum H_t$ = Total price of all shares at the current time

$\sum H_0$ = Total price of all shares at the base time

Scale Method

$$IHSG=\frac{\sum H_t K_t}{\sum H_0 K_t} X100\%$$

å H_t = Total price of all shares at the current time

å H_0 = Total price of all shares at the base time

K_t = number of all shares outstanding at the applicable time

Gross Domestic Product was an indicator used to determine the economic growth of a country (Choi, 2023). Gross Domestic Product as a sum of money was calculated based on the number of units of products produced in a country in a certain period of time (Chang et al., 2023). Gross Domestic Product could be interpreted as the market value of products and services produced in a given period of time, including the income of foreign companies and foreign residents working in the country but excluding the income of residents of the country and local companies operating outside the country (Cai et al., 2022). A country's Gross Domestic Product could be measured by 3 approaches that would produce the same Gross Domestic Product value. The three approaches were; Produce Approach, Expenditure Approach, Income Approach (Du Rietz, 2023). The interest rate could be interpreted as the amount of money earned on investments made previously in a certain period, the interest rate affects various decisions both decisions for consumption or saving, buying a house, and buying bonds or placing funds in savings. There were two types of interest rates, namely the nominal interest rate and the real interest rate (Hong et al., 2022).Inflation describes the raise of all prices in an economy environment (Baker & Lam, 2022). There were many factors that cause inflation, such as an increase in the quantity of money. When there was too much money in circulation, the value of the money decreases (Basse & Wegener, 2022). One type of inflation was hyperinflation (Deng et al., 2022). Hyperinflation occurs very quickly and causes a drastic decrease in the value of money (Armantier et al., 2022).

In contrast to inflation and hyperinflation, deflation was a situation where prices fall/the value of the country's currency strengthens. Prolonged inflation reflects the percentage growth of the money supply (Adam et al., 2022). The more the amount of money in circulation in a country, the higher the inflation rate (Nakagawa & Suimon, 2022). Therefore, the role of the central bank was important to regulate the inflation rate in the country. Bank Indonesia could influence the inflation rate through the monetary policy transaction mechanism. The central bank rate would be changed to induce adjustments in economic and financial variables to achieve a predetermined inflation rate (Chen et al., 2022). The process usually takes a long time.Types of investment based on the party making the investment could be divided into two, namely private investment and public investment (Baussola & Carvelli, 2023). Private investment was a type of investment made by private parties. The purpose of this investment was to gain profit from the investment made (Li et al., 2023). Meanwhile, investment made by the government was called government investment and its purpose was more towards the welfwere of its people (Matvejevs & Tkacevs, 2023). A country's private investment was reflected by its investment value in the form of Domestic Investment and Foreign Investment. According to the Law of the Republic of Indonesia number 25 of 2007, Domestic Investment could be defined as investment activities to conduct business in the territory of the Republic of Indonesia carried out by domestic investors using domestic capital. Meanwhile, Foreign Investment could be interpreted as an investment activity to conduct business in the territory of the Republic of Indonesia carried out by foreign investors, either using foreign capital entirely or in partnership with domestic investors (Węgrzynowska et al., 2023).

III. METHODS

The object of this research were infrastructure, utilities, and transportation sector companies listed on the Indonesia Stock Exchange. The infrastructure, utilities and transportation sector was divided into several subsectors, namely energy, toll roads, ports, airports, telecommunications, transportation, and non-building construction. In this study the number of sample members were fifty one stocks. The dependent variable used was the stock price of the infrastructure, utilities and transportation sector. The independent variables in this study were inflation rate, interest rate, and private investment. The research time period was the first semester of 2023. This study uses multiple regression analysis methods. The aim was to analyze the effect of

three macroeconomic variables, namely the inflation rate, interest rate, and private investment on the stock prices of the infrastructure, utilities, and transportation sectors.

Research Framework

The regression framework to be defined as follows:

Stock Price = $a + \beta_1.Inf + \beta_2.Int + \beta_3.Inv + e_i$

Which:

a : Constanta

Inf : Inflation Rate

Int : Interest Rate

Inv : Private Investment

$\beta_1, \beta_2, \beta_3, \beta_4$: Independent Variables Coefficient

e_i : *error rate*

The statistical model helped the author to find out how the independent variables affect the dependent variable. The effect was seen from the coefficient value for each independent variable obtained after processing the data. The study involves three independent variables and one dependent variable. The three independent variables were inflation rate, interest rate, and private investment. And the dependent variable was the stock price of infrastructure, utilities, and transportation.The following was the research hypothesis to be tested: Ha_1: There was an effect of the inflation rate on the share price of the infrastructure, utilities and transportation sector; Ha_2: There was an effect of the interest rate on the share price of the infrastructure, utilities and transportation sectors; Ha_3: There was an effect of private investment on the stock prices of infrastructure, utilities, and transportation sectors

IV. RESULT AND DISCUSSION

The Pearson correlation test was used as one of the bivariate analyswas methods which aims to see if there was a relationship between variables, the direction of the relationship, and also the level of closeness of the relationship that occurs. The following was a table of Pearson correlation test results obtained. Variables were said to had a relationship with other variables if the p (value) value ≤ 0.05. The direction of the relationship was seen from the Pearson correlation value. If the value was negative then the relationship was inversely proportional, and vice versa. While the level of relationship closeness could be concluded by comparing the Pearson correlation values,

Table 1. Pearson Correlation Test Result

Correlations

		HARGAINF	INFLATION	INTEREST	INVEST
HARGAINF	Pearson Correlation	1	-.077	-.121**	.014
	Sig. (2-tailed)		.096	.009	.762
	N	472	472	472	472
INFLATION	Pearson Correlation	-.077	1	.598**	.126**
	Sig. (2-tailed)	.096		.000	.006
	N	472	472	472	472
INTEREST	Pearson Correlation	-.121**	.598**	1	-.033
	Sig. (2-tailed)	.009	.000		.479
	N	472	472	472	472
INVEST	Pearson Correlation	.014	.126**	-.033	1
	Sig. (2-tailed)	.762	.006	.479	
	N	472	472	472	472

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Data (2023)

It could be seen that there were three relationships that occur. First, there was a negative and very weak relationship between the stock prices of the infrastructure, utilities and transportation sector and the interest rate. In other words, if the stock price falls, the interest rate would raise and vice versa. This could be seen from the p value value of 0.009 which was smaller than 0.05 and the Pearson correlation value of -0.121 which indicates that the relationship was negative and very weak. Second, there was a positive and strong relationship between interest rates and inflation. In other words, if the interest rate increases, the inflation

rate would also increase and vice versa. This was illustrated by the p value value of 0.000 and the Pearson correlation value of 0.598 which indicates that the relationship was positive and strong. The movement of the inflation rate was always followed by the adjustment of the nominal interest rate by Indonesia Central Bank Indonesia and both independent variables had the same direction of movement in accordance with the Fisher Effect theory, although the relationship did not occur quickly. There was a time lag where the nominal interest rate adjustment was not didne immediately.Finally, there was a positive and very weak relationship between private investment and inflation rate. In other words, if private investment in Indonesia increases, the inflation rate would also increase and vice versa. This conclusion was obtained from the p value value of 0.006 and the Pearson correlation value of 0.126 which indicates that the relationship was positive and very weak. This relationship could be seen in graph below. The author uses the percentage of private investment in each quarter compaered to the total private investment during the study period. In the graph, private investment and inflation rate had a unidirectional positive relationship.The autocorrelation test is conducted again after the three steps above have been carried out. The following are the results of the autocorrelation test after data transformation.

Table 2. Durbin Watson Value

Model	R	R Square	Durbin Watson
1	.922	.851	3.842

Source: Research Data (2023)

It could be seen that the value of d after transformation increases to 1.955. Using the previous analysis, the DW value was already in the range du < d < 4 - du. The DW value = 1.955 was greater when compwered to du = 1.859 and smaller when compared to 4 - du = 4 - 1.859 = 2.141. (1,859 < 1,955 < 2,141). With the above results it could be concluded that there was not enough evidence to reject H_0 or there was no autocorrelation. The heteroscedasticity test was carried out with the aim of ensuring that the residual value in the regression model was homogeneous or fixed. The heteroscedasticity test in the research in this study was carried out by looking at the pattern on the scatterplot between ZPRED and SRESID. If there was no clear pattern and the dots were scattered above and below the number 0 on the Y axis, then homoscedasticity occurs. In the scatterplot above, the dots did not form a certain pattern and were scattered randomly both above and below the number 0 on the Y (Regression Standardized Residual) axis. Therefore, it could be concluded that there was no heteroscedasticity in the regression model. After conducting a normality test and classical assumption test, the researcher then conducted multiple regression analysis. Regression analysis was carried out with the aim of knowing the effect of how the inflation rate, interest rate, and investment affect the share price of infrastructure, utilities, and transportation. The result of multiple regression analysis was the coefficient for each independent variable to be substituted into the research model.

Table 3. Multiple Linear Regression Test Result

Model	Unstandardized Coefficients		ıdardized Coefficients
	B	Std. Error	Beta
(Constant)	.391	.102	
Inflation	-.017	.082	-.009
Interest	-.585	.322	-.115
Invest	.083	.036	.011

Source: Research Data (2023)

Based on the table above, it can be seen that the research model is concluded as follows.

HargaInf = 0.391 – 0.017 Inflation – 0,585 Interest + 0,083Invest

The constant value in the table above was 0.391, which means that the shwere price of the infrastructure, utilities, and transportation sectors would be 0.391 even if the three independent variables were 0. The coefficient value of inflation was -0.017 or in other words, every 1 percent increase in inflation would reduce the shared-price of the infrastructure, utilities, and transportation sectors by IDR 0.017 assuming other independent variables remain. The coefficient value of the interest rate was -0.585, which means that every increase in the interest rate by 1 percent would increase the share price of the infrastructure, utilities and transportation sectors by IDR 0.585 assuming other independent variables remain constant. The coefficient value for the private investment variable was 0.083 or in other words, every increase in private

investment by IDR 1.00 would increase the stock price by IDR 0.083 assuming other independent variables remain constant. This test was conducted to determine whether the inflation rate, interest rate, and private investment together and simultaneously affect the stock price of infrastructure, utilities, and transportation. Decision making in the F test was done by comparing the p value value with a critical value (α) of 0.05. H_0 was rejected if the p value ≤ 0.05 or all independent variables simultaneously affect the dependent variable. Conversely, if the p value ≥ 0.05, then H_0 was accepted, in other words, all independent variables did not simultaneously affect the dependent variable.

- $H_0 : b_1, b_2, b_3 = 0$
  There is no simultaneous influence of the independent variables on the dependent variable.
- $H_a : b_1, b_2, b_3 \neq 0$
  There is a simultaneous influence of the independent variable on the dependent variable.

Here are the results of the F test.

Table 4. F Test Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.293	3	.431	2.340	.073[b]
	Residual	86.225	468	.184		
	Total	87.518	471			

a. Dependent Variable: HARGAINF

b. Predictors: (Constant), INVEST, INTEREST, INFLATION

Source: Research Data (2023)

In the table above, it could be seen that the p value of the F test results was 0.073. This value was greater than the value of α 0.05. Therefore, it could be concluded that there was not enough evidence to reject H_0 or there was no simultaneous effect of inflation rate, interest rate, and private investment on the stock price of infrastructure, utilities, and transportation. This may occur because the risk profile of most Indonesian investors was speculators who tend to conduct stock transactions using technical analysis so that fundamental conditions such as the three independent variables were not given much attention. The t test was conducted to see whether the independent variable partially affects the dependent variable. The t statistical test results were obtained when performing multiple linear analysis. The basis for making decisions for the t statistical test was if the p (value) value listed in the table was smaller than the critical value (α) of 0.05 then H_0 was rejected or there was an effect of the independent variable on the dependent variable partially. The following were the results of the t statistical test.

Table 5. t Test Result

Model	Unstandardized Coefficients		dized Coefficien	t	Sig.
	B	Std. Error	Beta		
(Constant)	.391	.112		3.526	.000
Inflation	-.017	.082	-.009	-.162	.871
Interest	-.585	.322	-.115	-1.988	.047
Invest	.083	.036	.011	.244	.807

Source: Research Data (2023)

The explanation for the table above was as follows. The following was the statistical hypothesis for the inflation rate in this study; H_{01}: There was no significant influence between the inflation rate and the share price of the infrastructure, utilities and transportation sectors; H_{a1}: There was a significant influence between the inflation rate and the share price of the infrastructure, utilities and transportation sectors In the table above, it could be seen that the p (value) value for the inflation rate was 0.871. This value was greater than the critical value of 0.05 so it could be concluded that $H_0$1 was accepted or in other words there was no significant effect between the inflation rate and the share price of the infrastructure, utilities and transportation sectors listed on The Indonesia Stock Exchange. The results of this study were in line with research conducted which reveals that the inflation rate had no significant effect on stock prices in other

developing countries. The inflation rate was an indicator that stock prices would decline. Inflation, which was described by an increase in prices, would cause companies to spend more to buy materials for production needs, pay transportation costs and labor wages, and so on. This would increase the cost of production and the selling price of the product, but there could be situations when the increase in production costs was higher than the increase in the price set. As a result, profitability as measured by the company's net income value would fall and make investors feel that the company's future prospects were not so good and eventually sell.

The stock price would decrease in accordance with the increase in stock supply. However, this theory did not apply absolutely to infrastructure, utilities and transportation sector stocks in Indonesia. For example, the highest inflation rate in 2022 occurred in June and July with a value of 8.16%. The author uses the shares of the energy blue chip category establishments because the stock was an infrastructure, utility, and transportation sector stock that was included in the blue chip category; H_{02}: There was no significant influence between interest rates on the share price of the infrastructure, utilities and transportation sectors; H_{a2}: There was a significant influence between interest rates on the share price of the infrastructure, utilities and transportation sectors. In the table above, it could be seen that the p value for the interest rate was 0.047. This value was smaller than 0.05 so it could be concluded that $H_0$2 was rejected or in other words, there was sufficient evidence that there was a significant influence between interest rates on the share prices of the infrastructure, utilities and transportation sectors. The results of this study were in line with the results of research which reveals that interest rates had a significant effect on stock market performance in South East Asian countries. Interest rates allow investors to switch investment products from stocks to bank deposits to get optimum returns, of course, also by considering risk factors. It was revealed that the interest rate was an indicator that stock prices would fall. High interest rates were attractive to investors. They would prefer to invest their investment funds in products such as savings and deposits because these products would provide a return that may be slightly below or even above the return from stock investment with risks below stock investment. As a result, investors would sell, for those who were holding stocks, so that the supply of stocks would increase and had an impact on the decline in stock prices.

This independent variable was measured by the amount of investment in the form of Foreign Investment and Domestic Investment. The statistical hypothesis for this study was: H_{03}: There was no significant effect between private investment and the share price of the infrastructure, utilities and transportation sector; H_{a3}: There was a significant influence between private investment on the share price of the infrastructure, utilities and transportation sectors. The private investment variable had a p value of 0.807 and this value was greater than the α value so it could be concluded that H_{03} was accepted or in other words there was insufficient evidence that there was a significant influence between the value of private investment on the share price of the infrastructure, utilities and transportation sectors listed on The Indonesia Stock Exchange. Foreign investment in a country makes the market liquid and encourages investors to invest in the capital market so that stock prices increase. The author compares the effect of foreign investment because the value of foreign investment was greater than domestic investment so it was more reflective if using foreign investment. In theory, Gross Domestic Product was an indicator that describes the total products successfully produced in a country in a certain period.

$$PDB = C + I + G + NX$$

Which:
GDP = Gross Domestic Product
C = Consumption
I = Investment
G = Government Expenditure
NX = Net Export (Export – Import)

In the formula above, it could be seen that one of the components in the calculation of Gross Domestic Product was investment. There were various forms of investment and one of them was private investment. The value of private investment and Gross Domestic Product had a unidirectional relationship

where an increase in private investment would lead to an increase in Gross Domestic Product as well. Increased private investment was an indicator that stock prices would raise. Private investment would increase Gross Domestic Product and result in an increase in people's income in a country. This causes people to tend to had the remaining funds allocated to invest in investment products such as stocks. As a result, stock transactions would increase and stock prices would increase. The theory above was not in line with the findings of this study. This could occur for several reasons, one of which was due to the time difference between the investment plan and its realization. Usually, investment realization was preceded by the existence of issues related to the investment plan, either obtained from related parties, both formal and informal.

When this happened, investors responded to this by making investment decisions so that the share price would increase. When investment realization occurs, investors no longer respond, it could also be because the information was not available, so that the stock price movement was not significant. The coefficient of determination R square was used to measure the extent to which the model was able to explain the dependent variable stock price of the infrastructure, utilities and transportation sector. The coefficient of determination was obtained after performing regression. The value range for the coefficient of determination was 0 - 1. The value that was closer to one illustrates the better the model explains the dependent variable. Vice versa, the coefficient of determination value that moves away from the number one illustrates the limited information provided in explaining the dependent variable. The following was a table of regression analysis results that illustrates the coefficient of determination.

Table 6. Coefficient Determination

Model	R	R Square	Adj R Square	Std. Error of the Estimate
1	.922[a]	.851	.758	.32125

a. Predictors: (Constant), Invest, Interest, Inflation
b. Dependent Variable: PriceInf
Source: Research Data (2023)

In the table above, it could be seen that the coefficient of determination was 0.851 or 85.1%. This means that the three independent variables, namely the interest rate, inflation rate, and private investment were able to explain the variation in stock price changes in the infrastructure, utilities and transportation sectors by 85.1%. While 14.9% were explained by other variables outside these variables.

V. CONCLUSION

The study wanted to explore further on how the three macroeconomic variables, namely the inflation rate, interest rate and private investment on the stock price of the infrastructure, utilities, and transportation sectors. The findings showed that fundamental variables had no effect on the stock prices of the infrastructure, utilities, and transportation sectors. Based on the F test, the inflation rate, interest rate, and private investment did not simultaneously affect the stock price of the infrastructure, utilities, and transportation sector. This could be seen from the p value of 0.073 and the value was greater than the critical value ($\alpha = 0.05$).

Based on the t statistical test, it could be concluded that only the interest rate had a significant effect on the share price of the infrastructure, utilities and transportation sectors listed on the Indonesia Stock Exchange. After conducting the Pearson correlation test, it could be concluded that there was a very weak negative relationship between infrastructure, utilities, and transportation stock prices and interest rates. There was a positive and strong relationship between interest rates and inflation. Finally, there was a positive and very strong relationship between private investment and the inflation rate. The coefficient of determination R square obtained after regression analysis was 85.1% or in other words, the resulting regression model was able to explain the stock price variable by 85.1%. The remaining 14.9% was explained by other variables besides the three macroeconomic variables.

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