# EFFECT OF MACROECONOMIC VARIABLES ON THE TELECOMMUNICATION SECTOR SHARE RETURN

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**Abstract:** This study aims to see the effect of macroeconomic factors on stock returns in telecommunications companies listed on the Indonesia Stock Exchange for the period 2015 to 2020. The factors analyzed in this study are GDP, inflation, interest rates, and the rupiah exchange rate as independent variables and stock returns. as the dependent variable. The data analyzed in this study belong to the type of quantitative research. By selecting samples using purposive sampling obtained as many as 4 samples of telecommunications companies. The method of analysis of this study uses panel data regression and the data used in this study are secondary data. The results of this study indicate that the coefficient of determination (R2) is 26.32%, while the remaining 73.68% is the fact by other factors outside the study. The results of this study indicate that the GDP variable does no effect on telecommunications stock returns. However, the Inflation and Exchange Rate variables have a significant effect on stock returns with a negative effect. Meanwhile, the interest rate variable has a significant effect on stock returns with a positive effect on stock returns of telecommunications companies listed on the Indonesia Stock Exchange for the 2015-2020 period.

**Keywords:** Macroeconomics, GDP, Inflation, Rupiah Exchange Rate, Interest Rates and Stock Returns.

## INTRODUCTION

According to BPS data from the results of the Susenas Survey data collection (2018), where 39.90% of Indonesia's population has accessed the internet in 2018. The high use of the internet reflects the climate of information openness and public acceptance of technological developments and changes to the information society. Common telecommunications service activities in Indonesia include value-added telephone services and multimedia services. The decline in value-added telephone services is inversely

proportional to multimedia services. As in telecommunication networks, there has been a shift in technology from wired telephony to wireless telephony, multimedia services have also begun to replace the role of other telecommunications services. The use of the internet, the growth of internet cafes, and the penetration of digital technology have significantly affected society. The number of telephone telephones for telephones has been abandoned and decreased due to the times.

In the last five years, the use of Information and Communication Technology (ICT) by households in Indonesia has shown a rapid development. The development of several indicators of the use of ICT by households in Indonesia is shown in Figure 1.1 below:
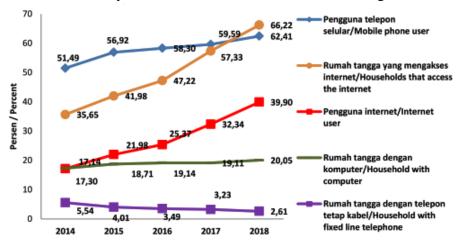


Figure 1.1 *Trend of ICT Indicators in Indonesia*, 2014 – 2018
Source: BPS, Survei Sosial Ekonomi Nasional (2019)

Therefore, Indonesia is one of the countries where the people are the largest users of telecommunication using mobile phones or cellphones in the world. The data shows that the use of mobile phones in Indonesia reaches 280 million, exceeding its population of 260 million. Thus, the telecommunications sector in Indonesia is a very promising business for investors to invest at this time. And amid technological developments that have grown rapidly in recent years, several telecommunications companies have experienced fluctuations in share prices. This can be seen in Figure 1.2.
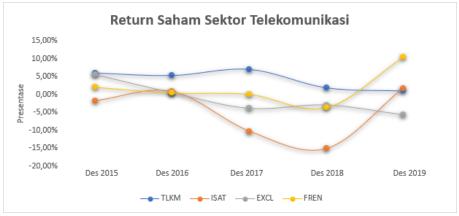


Figure 1.2 Return of Telecommunications Sub-Sector Shares in 2015 - 2019

Source: Yahoo Finance that has been processed (2020)

Based on Figure 1.2, stock returns of the telecommunications sub-sector from 2015 to 2019 have fluctuated on average. For example, the shares of PT Telekomunikasi Tbk (TLKM) experienced an increase in stock returns from 2015 of 5.97% to 6.99% in 2017. While in 2018, TLKM's stock returns decreased to 1.90%, as well as in 2019 it became as big as 1.02%. This is inversely proportional to the other three stock returns, namely PT XL Axiata Tbk (EXCL), which decreased from 2015 by 5.49% to -3.90% in 2017, PT Smartfren Telecom Tbk (FREN) also experienced a decline from 2015 amounting to 1.99% to 0.00% in 2017 and PT Indosat Tbk (ISAT) also decreased from 2015 of -1.79% to -10.28% in 2017 but both ISAT and FREN shares recorded an increase in 2019 to 1.75% and 10.40% and inversely proportional to EXCL shares which experienced a decline of -5.69% in 2019.

Martalena and Maya Malinda (2011) state that the price movements of a share in the capital market are influenced by several factors, both internal and external factors. These internal and external factors can be used as a reference for investors to predict the stock returns that will be obtained. Internal factors are factors that are seen from within the company which is specific to these shares, such as sales, financial performance, management performance, company conditions, and the industry in which the company operates. Meanwhile, external factors are macro in influencing stock prices on the stock exchange, such as inflation, interest rates, foreign currency exchange rates, and non-economic factors such as social, political, and other factors. Internal factors have been conducted a lot of research related to the influence of internal factors but on the contrary, the influence of external factors on stock returns has not been studied much. There fore this study will focus on macroeconomic variables/external factors that can affect stock returns.

However, the results of theoretical studies related to the influence of macroeconomic variables on stock returns vary, this is reflected in the results of various empirical studies. As research conducted by Donatas Plinkus, Vytautas Boguslauskas (2009) and Tarika Singh, Seema Mehta, and MS Varsha (2011) in their research results found a positive effect of GDP on stock returns, unlike the results of research Evans, et al (2014), Kaunyangi Eliud, et al (2015) and Herlina Anggraini (2016), which in fact reveal different empirical studies, namely that GDP has no effect on stock returns. Other research is also from Ratna Sari (2018), Frihardina Marsintauli (2019), Prasetyo Wira Satria, et al (2017) which states that inflation, exchange rates, interest rates do not affect stock returns, but not the research results from Endri, Zaenal. Abidin, et al (2020), M. Fauzan, et al (2018), Siti Sunayah, et al (2016), and Andre Wella Rumengan, et al (2015) state that inflation, exchange rates, and interest rates affect stock returns. These different results encourage researchers to further examine the effect of macroeconomic variables on stock returns, particularly in the telecommunications sector.

Based on the research background that has been described above, the main problems that the authors want to raise in the study are:
a. Does gross domestic product (GDP) affect stock returns in the telecommunications industry listed on the Indonesia Stock Exchange (IDX)?

b. Does the interest rate affect stock returns in the telecommunications industry listed on the Indonesia Stock Exchange (IDX)?

c. Does the inflation rate affect stock returns in the telecommunications industry which are listed on the Indonesia Stock Exchange (IDX)?

d. Does the exchange rate affect stock returns in the telecommunications industry which are listed on the Indonesia Stock Exchange (IDX)?

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 1.  Arbitrage Pricing Theory (APT)

The Capital Asset Pricing Model is not the only theory that attempts to explain how an asset is priced by the market. By using APT, Chen et al. (1986) proved that macroeconomic variables have a systematic influence on the stock market returns. Economic forces affect the discount rate (discount rate), the company's ability to drive cash flow (cash flow), and dividend payments in the future (future dividend payouts). A mechanism like this shows that macroeconomic variables are crucial factors in the equity market. In addition, Ross (1976) formulated a theory known as Arbitrage Pricing Theory (APT).

### 2.  Multi-Factor Model

The factor model or index model assumes that a security's returns are sensitive to changes in various factors or indices. The factor model is based on the assumption that there is a linear relationship between the price of a stock and the price of all the shares on the exchange represented by the market index. On the basis of this assumption, the rate of return of a stock will be correlated with changes in market prices (Sharpe, Alexander, Bailey (1999).

The multi-factor model assumes that the stock price determination process involves several factors. This means that there are several possibilities that more than one causative factor (pervasive factor) in the economy affects stock prices. The economic situation affects almost all companies.

For example, there are two sources of macroeconomic risk, namely GDP and the interest rate that cannot be ascertained against the stock price. According to Bodie, Kane, and Marcus (2006), the multifactor model in simple terms can be stated as follows:

$$\text{Ri} = \text{E(ri )} + \beta\text{iGDPGDP} + \beta\text{iIRIR} + \text{ei}$$

Information:

Ri            = Random Rate of Return on Securities *i*

E(ri )      = The expected return on the security *i*

βiGDP   = The sensitivity of the-*i* security to the GDP factor

βiIR       = The sensitivity of the-*I* security to the IR factor

ei            = The Influence of Company Specific Factors

### 3.  Stock Returns

Stock return is the level of profit enjoyed by investors or investors on their stock investment (Haanurat, 2013). Return or return is the profit that companies, individuals, and institutions get from the results of their investment policies (Sunayah and Ibrahim, 2016). So

it can be concluded that the return of Islamic stocks is the profit or return obtained by investors, both companies, individuals, and institutions for their Islamic investments.

## 4. Gross Domestic Product

Gross Domestic Product (GDP) is a measure of a country's total production of goods and services. Rapid GDP growth is an indication of economic growth. If economic growth improves, people's purchasing power will increase and this is an opportunity for companies to increase their sales. With the increase in company sales, the opportunity for the company to benefit will also increase (Tandelilin, 2010).

## 5. Inflation

Inflation is a condition in which the general price level increases. High levels of inflation are often associated with an inefficient economy, namely an economy where the demand for goods and services exceeds productive capacity, leading to pressure on prices (Bodie et al, 2010).

## 6. Exchange Rate

Foreign exchange rates can also be defined as the amount of domestic money needed, namely the number of IDR needed to obtain one unit of foreign currency. Exchange rates between two countries often differ from one period to another (Sukirno 2010).

## 7. Interest Rate

According to Boediono (2011), the Interest Rate is the price that must be paid in the event of exchange between one Rupiah now and one Rupiah later. An unreasonable increase in interest rates will make it difficult for the business world to pay interest expenses and obligations because high interest rates will add to the burden on the company so that it will directly reduce company profits.

## 8. Research Framework

Based on some of the descriptions above, the effect of each independent variable on the dependent variable can be described in a paradigm model as shown in Figure 2.1 below:
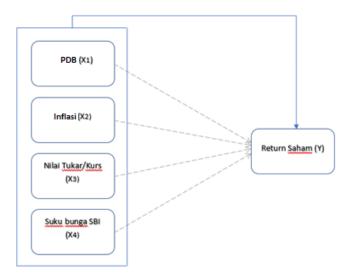


Figure 2.1 Research Framework
Sumber: Author (2020)

From the figure, the independent variables X1, X2, X3, and X4 show a partial influence on the dependent variable Y, while the combination of the independent variables X1, X2, X3, and X4 shows a simultaneous influence on the dependent variable Y.

## 9. Hypotheses

Hypotheses are temporary answers to the formulation of research problems, therefore the formulation of research problems is usually arranged in the form of questions. It is said temporarily because the answers given are only based on relevant theories, not based on empirical facts obtained through data collection. So the hypothesis can also be stated as a theoretical answer to the formulation of research problems, not an empirical answer according to Sugiyono (2010).

Based on literature review and predecessor research, some of the hypotheses proposed in this study are:

H-1: GDP has an effect on stock returns

H-2: Inflation has an effect on stock returns

H-3: Exchange rate has an effect on stock returns
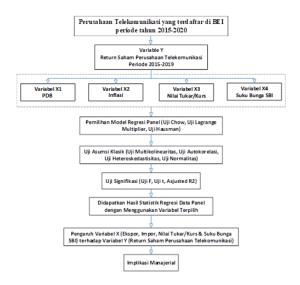
H-4: SBI interest rates has an effect on stock returns.

## RESEARCH METHODS

### Types of Research

This research is an associative type of research with a comparative causal relationship in which there are dependent variables and independent variables. This study has a deductive character because this study aims to test the hypothesis on whether or not there is a significant relationship between the independent variable and the dependent variable. Judging from the data collected, this study is a quantitative study because there is a calculation of research data in the form of numbers that can be obtained from external data published to the public (Indriantoro & Supomo, 2013).

### Research Method Framework

Figure 3.1 shows the research method framework used as the basis for research on the

Figure 3.1 Research Method Framework
Sumber: Author (2020)

influence of macroeconomic factors (X) on stock returns of telecommunications companies listed on the IDX for the 2015–2019 period. The sub-sectors to be studied in this study are the telecommunications sub-sectors that have been listed on the IDX (listed companies) which are taken as many as 4 companies that have been listed on the IDX until 2019.

**Population and Research Sample**

In general, in a study researchers need what is called a population. According to Sugiyono (2013) population is a generalization area consisting of objects or subjects that have certain qualities and characteristics that are determined by researchers to be studied and then draw conclusions.

The sample according to Sugiyono (2013) is part of the number and characteristics of the population. To determine the sample to be used in the study, researchers used a purposive sampling technique. The criteria for selecting the sample to be studied are as follows:

a. The GDP data used is quarterly data regarding the total value in percentage values for the period 2015 to 2020 obtained from the Central Statistics Agency.

b. The inflation data used is quarterly data regarding the total value in percentage value for the period 2015 to 2020 which is obtained from the Indonesian Agency

c. The exchange rate or exchange rate used is the quarterly middle exchange rate of the rupiah against the dollar published by Bank Indonesia.

d. The interest rate used in this study is the SBI interest rate or Bank Indonesia Certificate which is the quarterly average SBI interest rate from the BI Rate and BI 7- day (Reverse) Repo Rate published by Bank Indonesia.

e. Stock returns used are monthly closing price data for the period 2015 to 2020. The data used for stock returns is obtained from calculating the difference between individual stock prices for the current period and the previous period.

**Operational Variables**

The operations of each variable in this study are as follows:

a. Independent Variable (X1): GDP

Gross Domestic Product (GDP) is a measure of a country's total production of goods and services. Rapid GDP growth is an indication of economic growth. If economic growth improves, people's purchasing power will increase and this is an opportunity for companies to increase their sales. With the increase in company sales, the opportunity for the company to make a profit will also increase (Tandelilin, 2010). The GDP growth rate is obtained by calculating GDP at constant prices obtained from BPS.

b. Independent Variable (X2): Inflation

Inflation is a condition in which the general price level increases. High levels of inflation are often associated with an inefficient economy, namely an economy where the demand for goods and services exceeds productive capacity, leading to pressure on prices (Bodie et al, 2010). High levels of inflation will not promote economic

development. Costs that continue to rise make productive activities very unprofitable. So the owners of capital usually prefer to use their money for speculative purposes.

c. Independent Variable (X3): Exchange Rate / Exchange Rate

The exchange rate used is the spot rate of Rupiah against US Dollar at Bank Indonesia periodically 1 month which is processed from annual report data. In this study, the US Dollar is used because the US Dollar is a hard currency and is widely used as a means of transactions with other countries such as exports, imports, debt payments, and so on. Hakim (2013) states that the measurement of exchange rates is carried out by the formula:

$$\text{Kurs tengah} = \text{kurs jual} + \text{kurs beli} / 2$$

d. Independent Variable (X4): SBI interest rate

SBI interest rates are securities on the rupiah show issued by Bank Indonesia in recognition of short-term debt under a discount system. The SBI interest rate used is the 1-month term interest rate. This is because the SBI interest rate is an important factor in determining interest rates in Indonesia.

SBI purchases are based on cash value based on a pure discount (true discount) obtained from the following formula:

$$\text{Nilai Tunai} = \frac{\text{Nilai Nominal} \times 360}{360 + [(\text{Tingkat Diskonto} \times \text{Jangka Waktu})]}$$

e. Dependent Variable (Y): Stock Return

This variable is the dependent variable (Y). This variable is the result obtained from an investment in the form of shares. In this study, the stock return indicator used is the stock return for one year. The formula used is as follows Jogiyanto (2009).

$$Return\ Saham = \frac{P_t - P_{t-1} + D_t}{P_{t-1}}$$

Information:

$P_t$ = Share price in period t

$P_{t-1}$ = Share price in peroid t-1 (sebelumnya)

$D_t$ = Periodic Dividends

**Method of Collecting Data**

The data collected as a basis for the assessment of this research is time-series data in the form of quarterly data collected from 2015 s.d. 2020 with the consideration of the latest data and in that period it can represent the latest dynamics of the Indonesian economy and based on technical considerations that the relationship and influence of each of these time series variables will have an optimal impact on the monthly interval period.

**Data Analysis Method**

In compiling this study, the authors used a collection method. This study applies a panel regression analysis method. This method is used to develop a model or equation and test the effect of the independent variables on the dependent variable with an interval or ratio measurement scale. The data will be tested descriptive statistics, panel regression test for the selection of the best model (Chow test and Hausman test), and hypothesis testing (F test, t-test, and Goodness of Fit Model) using the EViews software application (Econometric Views) and software. Microsoft Office Excel. The advantages of using this analysis include Tri Basuki (2015):

a. Able to provide more data, so as to provide more complete information. So that a greater degree of freedom (df) or degrees of freedom is obtained and it reduces the collinearity between the explanatory variables so as to produce a better estimate.
b. By combining information from time series and cross-section data, it can solve problems that arise because there are problems with omitting variables.
c. Providing greater data information than time-series data and cross-sectional data.
d. Panels can provide better solutions in detecting and measuring effects that time-series and cross-section data simply cannot.
e. Can test and build more complex behavior models. For example, phenomena such as economies of scale and changes in technology.
f. Panel data can minimize bias generated by individual aggregates because more data are observed.

The general model of panel data regression is as follows:

$$RS = \beta_0 it + \beta_1 Pdb_{it} + \beta_2 inf_{it} + \beta_3 ER_{it} + \beta_4 birate_{it} + e_{it} \ldots\ldots\ldots\ldots\ldots(3.2)$$

Information:

| | |
|---|---|
| RS | = dependent variable (stock return) |
| $\beta_0$ | = constant |
| Pdb | = PDB (independent variable 1) |
| Inf | = inflasi (independent variable 2) |
| ER | = kurs USD/IDR (independent variable 3) |
| Birate | = suku bunga BI rate (independent variable 4) |
| $\beta_1, \beta_2, \beta_3, \beta_4$ | = independent variable coefficient |
| e | = error term |
| i | = company |
| t | = year |

## RESULTS AND DISCUSSION
### Descriptive Data

Descriptive statistics provide an overview of the variables used in the study. The results of descriptive statistics explain the average size, highest value, and lowest value of the GDP, inflation, exchange rate, SBI ,and stock returns variables. The results of descriptive statistics of the research variables can be seen in Table 4.2.

Table 4.2 Descriptive Statistics of Research Data

|  | PDB (X1) | Inflasi (X2) | Kurs (X3) | SBI (X4) | Return Saham (Y) |
|---|---|---|---|---|---|
| Mean | 1.475909 | 0.037473 | 13891.5 | 0.056023 | -0.00494 |
| Median | 1.1 | 0.0337 | 13806.5 | 0.0525 | 0 |
| Maximum | 5.12 | 0.0726 | 16367 | 0.075 | 0.579803 |
| Minimum | -5.99 | 0.0196 | 13067 | 0.0425 | -0.340426 |
| Std. Dev. | 3.008981 | 0.013459 | 740.0926 | 0.011489 | 0.125191 |
| Observations | 88 | 88 | 88 | 88 | 88 |

Source: Primary data processed (2020*)*

**Panel Data Regression Selection**
  **a. Chow Test**
    In this test the model selection, where the common effect or fixed effect estimation model will be used, by testing the hypothesis:
    H0: Choose to use the common effect estimation model
    H1: Choose to use a fixed effect estimation model
    In this test, you can see the p-value if the results obtained are less than 5% (significant), then the estimation model that will be used is the fixed effect, but if the p-value exceeds 5% (not significant), then the estimation model used is the fixed effect. used is the common effect model.

Table 4.3 Chow Test Estimation Results

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

| Effects Test | Statistic | d.f. | Prob. |
|---|---|---|---|
| Cross-section F | 1.833093 | (3,69) | 0.1492 |
| Cross-section Chi-square | 5.904587 | 3 | 0.1163 |

Source: Eviews data processing (2020)

The results of the redundant fixed-effect or likelihood ratio for this model have a probability value greater than Alpha (0.05) so that H0 is accepted and H1 is rejected, the appropriate model for this result is the common effect (because the probability value is 0.1492> 0.05).

  **b. Hausman Test**
    Panel data regression is carried out using two models, namely the fixed effect model and the random effect model. For the purpose of choosing the best model among the fixed effect and random effect models to be used as a research model, it is directly based on the following Hausman test.

Table 4.4 Hausman Test Estimation Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Period random | 8.071844 | 4 | 0.0890 |

** WARNING: estimated period random effects variance is zero.

Period random effects test comparisons:

| Variable | Fixed | Random | Var(Diff.) | Prob. |
|---|---|---|---|---|
| PDB | -0.001512 | -0.000628 | 0.000001 | 0.4538 |
| Inflasi | -3.184447 | -3.040343 | 0.095677 | 0.6413 |
| Kurs | -0.000060 | -0.000055 | 0.000000 | 0.3791 |
| SBI | 2.150893 | 2.690233 | 0.105463 | 0.0968 |

Source : Eviews data processing (2020)

The results of the Hausman statistical test above are then compared with the Chi-Square table with the degree of freedom equal to the number of independent variables.
   Terms:
a. χstatistics> χtable or P-value <α then Ho is rejected and the selected model is Fixed Effect and vice versa.
b. χstatistic <table or P-value> α then Ho is accepted and the model chosen is the Random Effect and vice versa.

The critical limit for rejecting Ho is based on the chi-square criterion for a significance level of α and a degree of freedom of df written: H$\chi$2df.

At the significance level (α) of 5% and degrees of freedom (df) of k-1 = 4-1 = 3, the critical limit is 7,815. The full comparison results are shown in the table below:

Table 4.5 Hausman Test Comparison Results

| Chi Square Hitung (Hausman Test) | Sign | Chi-Square Tabel | Conclusion |
|---|---|---|---|
| 8.071844 | > | 7,815 | Ho is accepted, then the model chosen is the Random Effect |

Source : Data processing (2020)

Based on the Hausman statistical test in table 4.5 above, shows that the appropriate model for modeling panel data in this study is the Random Effect approach.

**c. Lagrange Multiplier Test**

This LM test is used to ascertain which model will be used, the basis for doing this test is if the fixed and random test results are inconsistent. The Lagrange Multiplier Test or commonly referred to as the Lagrangian Multiplier Test is an analysis carried out to determine the best method in panel data regression, whether to use the common effect or the random effect. With the following hypothesis:

H0: Common Effect Model

H1: Random Effect Model

Table 4.6 Lagrange multiplier (LM) Test

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided
        (all others) alternatives

| | Test Hypothesis | | |
| --- | --- | --- | --- |
| | Cross-section | Time | Both |
| Breusch-Pagan | 0.557833 | 0.040205 | 0.598037 |
| | (0.4551) | (0.8411) | (0.4393) |
| Honda | 0.746882 | 0.200511 | 0.669908 |
| | (0.2276) | (0.4205) | (0.2515) |
| King-Wu | 0.746882 | 0.200511 | 0.772384 |
| | (0.2276) | (0.4205) | (0.2199) |
| Standardized Honda | 1.309540 | 0.210855 | -3.345400 |
| | (0.0952) | (0.4165) | |
| Standardized King-Wu | 1.309540 | 0.210855 | -1.698202 |
| | (0.0952) | (0.4165) | -- |
| Gourieroux, et al.* | -- | -- | 0.598037 |
| | | | (>= 0.10) |

| *Asymptotic critical values: | |
| --- | --- |
| 1% | 7.289 |
| 5% | 4.231 |
| 10% | 2.952 |

Source: Data processing (2020)

From the output results above, it can be seen that the value Prob. Breusch-Pagan (BP) of 0.4393 (In the third column, it is "Both"). according to the hypothesis, if Prob BP (0.4393> 0.05) then H0 is accepted and H1 is rejected, in other words, the suitable model is the Common Effect Model.

Based on paired testing of the three-panel data regression models, it can be concluded that the Common effect model in panel data regression is used further in this study:

Table 4.7 Conclusion of Panel Data regression model testing

| No | Method | Testing | Result |
|----|--------|---------|--------|
| 1 | *Chow Test* | *Common Effect Vs Fixed Effect* | *Common effect* |
| 2 | Hausman Test | *Fixed Effect Vs Random Effect* | *Random Effect* |
| 3 | Lagrange Multiplier | *Common Effect Vs Random Effect* | *Common Effect* |

Source: Data processing (2020)

## Classic Assumption Test

### a. Normality test

The results of the JB Test normality test after data transformation resulted in a probability or p-value of 0.0000 <0.05, then H0 was rejected or the residual value was not normally distributed. It can be concluded that with a 95% confidence level, the error term or residual value is not normally distributed. Because the data is not normally distributed, it is necessary to remove the Outlier data. The following is the result of the normality test with the JB Test after disposal of outlier data:
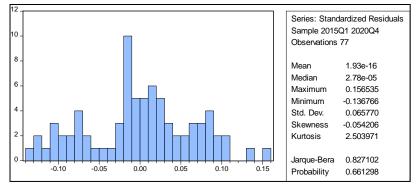


Figure 4.2 Jarque-Bera Normality Test Results (JB Test) after Cleaning Outlier Data
Source: processed statistics

### b. Multicollinearity Test

Multicollinearity is a condition where there is a linear relationship between independent variables. The presence or absence of multicollinearity can be known or seen from the correlation coefficient of each independent variable. If the correlation coefficient between each independent variable is greater than 0.8, then multicollinearity occurs.

Table 4.8 Multicollinearity Test

|         | PDB | Inflasi | Kurs | SBI |
|---------|-----|---------|------|-----|
| **PDB** | 1 | 0.452715121 | -0.304090751 | 0.259858003 |
| **Inflasi** | 0.452715121 | 1 | -0.286409613 | 0.64024641 |
| **Kurs** | -0.304090751 | -0.286409613 | 1 | -0.083070883 |
| **SBI** | 0.259858003 | 0.64024641 | -0.083070883 | 1 |

Source: processed statistics

The results of multicollinearity testing can be seen in table 4.8. Based on this display, it can be seen that the correlation coefficient of each independent variable is less than 0.8 so there is no multicollinearity problem.

**c. Heteroscedaskitas test**

Heteroscedasticity test is performed to find out whether, in a regression model, there is an inequality of variants from the residuals of one observation to another. If the variance from the residual of one observation to another is fixed, it is called homoscedasticity, while for different variances it is called heteroscedasticity. A good regression model is a model that is not heteroscedasticity.
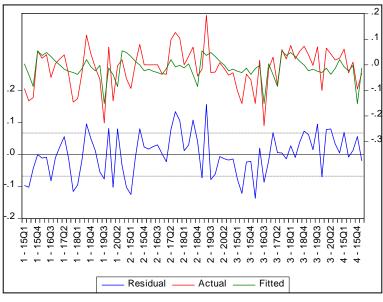


Figure 4.3 Heteroscedaskitas Test Results
Source: Processed Statistics

The results of the heteroscedasticity test can be seen that the residual value does not form a certain pattern, in other words, the residual tends to be constant, so it can be concluded that the heteroscedasticity test is fulfilled.

**d. Autocorrelation Test**

To detect autocorrelation, it can be done by paying attention to the Durbin Watson (DW) statistical value. The statistical DW value or the d coefficient that describes the DW coefficient is in the range of 0 to 4. To determine the presence or absence of autocorrelation, it can be seen what the d value is in the DW test table as in table 4.9.

Table 4.9 Autocorrelation Durbin Watson Test

| There is a positive | Correlation cannot be broken | No correlation | Cannot be broken | There is a negative correlation |
|---|---|---|---|---|

| 0 | $d_L$ 1,5 | $d_U$ 1,7 | 2 | 4-$d_U$ 2,3 | 4-$d_L$ 2,5 | 4 |

The results of the DW test on the regression model yielded a coefficient d of **1.627702**. These results are then compared with the results obtained from the Durbin-Watson statistical table with a significance level of 0.05. The number of independents

(free) variables is 4 (K-4), then the dL (outer limit) value is 1.5 and the dU (inner limit) value is 1.7. means 4 - dL (4-1.5 = 2.5) and 4 - dU (4-1.7 = 2.3). Because the DW value is between dL and dU or 1.5 <1.627702 <1.7, it can be concluded that the data in the regression model cannot be decided. Based on the DW test matrix, it can be concluded that the regression equation does not experience autocorrelation problems.

## 1. Panel Data Regression Model Analysis

The results of the panel data regression model have been tested with several classical assumptions, namely that they are free from the problems of normality, multicollinearity, heteroscedasticity, and autocorrelation. Testing the panel data regression model in this study using Eviews 9 software. The estimation results for the Common Effect model are shown in the following table :

Table 4.10 Estimation Results for Panel Data Regression Model

Dependent Variable: Return Saham
Method: Panel Least Squares
Date: 09/15/20   Time: 17:03
Sample: 2015Q1 2020Q2
Periods included: 22
Cross-sections included: 4
Total panel (unbalanced) observations: 88

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.712915 | 0.166155 | 4.290671 | 0.0001 |
| PDB | -0.000628 | 0.003004 | -0.208928 | 0.8351 |
| Inflasi | -3.040343 | 0.816810 | -3.722214 | 0.0004 |
| Kurs | -5.48E-05 | 1.16E-05 | -4.733874 | 0.0000 |
| SBI | 2.690233 | 0.865347 | 3.108848 | 0.0027 |

| | | | |
|---|---|---|---|
| R-squared | 0.301977 | Mean dependent var | -0.011338 |
| Adjusted R-squared | 0.263197 | S.D. dependent var | 0.078722 |
| S.E. of regression | 0.067572 | Akaike info criterion | -2.488503 |
| Sum squared resid | 0.328754 | Schwarz criterion | -2.336308 |
| Log likelihood | 100.8074 | Hannan-Quinn criter. | -2.427627 |
| F-statistic | 7.787099 | Durbin-Watson stat | 1.627702 |
| Prob(F-statistic) | 0.000028 | | |

*Source: processed statistics*

The linear regression equation model for panel data in this study has the following equation:

$$Y = 0.712915 - 0.000628X_1 - 3.040343X_2 - 5.48E\text{-}05X_3 + 2.690233X_4$$

Based on the regression equation, it can be interpreted that if the Gross Domestic Product (GDP) increases by 1 unit, with the assumption that other variables are constant, the stock return will turn by 0.000628 times. If inflation rises by 1 unit, assuming the other variables are constant, then the stock return will decrease by 3.040343 times. If the exchange rate increases by 1 unit with the assumption that other variables are constant, the stock return will decrease by 5.48E-05 times, and if the interest rate (SBI) increases by 1 level, assuming the other variables are constant, the stock return will increase by 2.690233 times.

### a. Significance Test (t test)

- Based on the t table value for the PDB variable at alpha 0.05 (one tail) the df value is 1.991, while the t value is -0.208928 (negative). It means that t count <t table, then the hypothesis is rejected. Thus, it can be concluded that GDP does not have a positive and significant effect on stock returns.

- Based on the t table value for the inflation variable at alpha 0.05 (one tail), the df value is 1.991, while the calculated t value is -3.722214 (negative). Means tcount> t table, then the hypothesis is accepted. Thus, it can be concluded that inflation has a negative and significant effect on stock returns.

- Based on the t table value for the exchange rate variable at alpha 0.05 (one tail), the df value is 1.991, while the calculated t value is -4.733874 (negative). Means tcount> t table, then the hypothesis is accepted. Thus, it can be concluded that the exchange rate has a negative and significant effect on stock returns.

- Based on the t table value for the SBI variable at alpha 0.05 (one tail), the df value is 1.991, while the calculated t value is 3.108848 (Positive). Means tcount> t table, then the hypothesis is accepted. Thus, it can be concluded that SBI has a positive and significant effect on stock returns.

### b. Simultaneous F Test

From the results of comparing the value of F table with F count, it is obtained that F count value is 7.787099 and F table is 2.500 (see Table F), thus the F count (7.787099)> F table (2.500) then Ho is rejected and Ha is accepted, so it can be concluded that there is a joint influence between GDP, inflation, exchange rate, and SBI together on stock returns in companies that go public in the telecommunications sector that are listed and active on the Indonesia Stock Exchange from 2015 to 2020.

### c. Determination Coefficient Test (R2)

Based on table 4.10 above, the amount of Adjusted R-squared of 0.263197 shows that the independent variables of GDP, inflation, exchange rates, and SBI are able to explain 0.263197 (26.32%) of the dependent variable of stock returns. While the remaining 0.7368 (73.68%) is explained by other independent variables that are not included in the regression estimation model.

## Discussion

### a. Hypothesis 1

Ho: GDP has no significant positive effect on stock returns
Ha: GDP has a significant positive effect on stock returns

Based on the t-test at α = 5% in table 4.10, the probability value of the GDP variable is 0.8351 or greater than 0.05, it can be concluded that GDP has no significant effect on stock returns. When viewed from the t table value at alpha 0.05 (one tail) df is 1.991, while the t value is -0.208928 (negative). It means that t count <ttable, then Ha is rejected and Ho is accepted. Thus, it can be concluded that GDP does not have a significant effect on stock returns in companies that go public in the telecommunications sector which are listed and active on the Indonesia Stock Exchange from 2015 to 2020.

### b. Hypothesis 2

Ho: Inflation has no significant positive effect on stock returns
Ha: Inflation has a significant positive effect on stock returns

Based on the t-test at α = 5% in table 4.10, the probability value of the Inflation variable is 0.0004 or less than 0.05, it can be concluded that inflation has a negative and significant effect on stock returns. When viewed from the t table value at alpha 0.05 (one tail) df is 1.991, while the t value is - 3.722214 (negative). It means that t count <t table, then Ha is accepted and Ho is rejected. Thus, it can be concluded that inflation has a negative and significant effect on stock returns in companies that go public in the telecommunications sector that are listed and active on the Indonesia Stock Exchange from 2015 to 2020.

### c. Hypothesis 3

Ho: Exchange rate has no significant positive effect on stock returns
Ha: Exchange rate has a significant positive effect on stock returns

Based on the t-test at α = 5% in table 4.10, the probability value of the exchange rate variable is 0.0000 or less than 0.05, it can be concluded that the exchange rate has a negative and significant effect on stock returns. When viewed from the t table value at alpha 0.05 (one tail) df is 1.991, while the t value is -4.733874 (negative). It means that t count <t table, then Ha is accepted and Ho is rejected. Thus, it can be concluded that the exchange rate has a negative and significant effect on stock returns in companies that go public in the telecommunications sector which are listed and active on the Indonesia Stock Exchange from 2015 to 2020.

### d. Hypothesis 4

Ho: SBI has no significant negative effect on stock returns
Ha: SBI has a significant negative effect on stock returns

Based on the t-test at α = 5% in table 4.10, the probability value of the SBI variable is 0.0027 or less than 0.05, it can be concluded that SBI has a positive and significant effect on stock returns. When viewed from the t table value at alpha 0.05 (one tail) df is 1.991, while the t value is 3.108848 (positive). It means that tcount> t table, then Ha is rejected and Ho is accepted. Thus, it can be concluded that SBI has a positive and significant effect on stock returns in companies that go public in the telecommunications sector that are listed and active on the Indonesia Stock Exchange from 2015 to 2020.

## CONCLUSIONS AND SUGGESTIONS

**Conclusions**

Based on the results of research on the effect of GDP, inflation, interest rates, and exchange rates on stock returns in telecommunication companies listed on the IDX for the 2015 - 2020 quarterly period. With 2020, as well as the introduction, theoretical studies, data processing, and the discussion that was carried out in the previous chapter, it is known that the research conclusions are as follows:

1. The GDP variable does not have a significant effect on stock returns in companies that go public in the telecommunications sector. Therefore, the first hypothesis which states that GDP has an effect on stock returns is not accepted

2. The inflation variable has a negative and significant effect on stock returns in companies that go public in the telecommunications sector. Therefore, the first hypothesis which states that inflation has an effect on stock returns is accepted.

3. Exchange rate variables have a negative and significant effect on stock returns in companies that go public in the telecommunications sector. Therefore, the first hypothesis which states that the exchange rate has an effect on stock returns is accepted.

4. The SBI variable has a positive and significant effect on stock returns in companies that go public in the telecommunications sector. Therefore, the first hypothesis which states that SBI has an effect on stock returns is accepted.

**Recommendations**

The results showed that the selected macroeconomic variables mostly influenced stock returns in the telecommunications sector, with the exception of GDP. Future forecasts must take into account inflation, exchange rates, and SBI in particular as having an influence on stock returns in the telecommunications sector. Inflation and the exchange rate have a negative effect on stock returns while the SBI has a positive effect.

SBI in their respective sequence is determined as a macroeconomic factor that has a positive effect on stock returns in the telecommunications sector while inflation and the exchange rate show a negative effect. Therefore, all investors need to pay close attention to these macroeconomic variables to invest in the telecommunications sector.

**Author Limitations**

This study has several limitations that can affect the study, these limitations are:

1. This study only takes the variables GDP, inflation, rupiah exchange rate/exchange rate, and interest rates from several other macroeconomic variables that are considered to influence stock returns. In the future, other macroeconomic factors such as unemployment rate, current account, and budget deficit can be added as well as factors that come from company performance such as earnings per share projections, use of debt, and dividend policy.

2. This study only limits telecommunications companies listed on the IDX from 2015 to 2020. For further research, it is hoped that not only telecommunications companies that

are consistent in each period will be the research samples, but also companies in other sectors.

3. From the statistical aspect, this study has limitations, especially in the relatively small amount of data used. This cannot be avoided, considering that there are only 4 telecommunications companies in the Indonesian Stock Exchange that can be included in this group.

4. This study only uses stock returns as the dependent variable.

**Suggestions**

Suggestions that can be applied in further research are as follows.

1. The coefficient of determination (adjusted $R^2$) of 26.32% indicates that there are 73.68% of other variables outside the variables used in the model that affect the stock returns of the telecommunications sub-sector. It is expected that future research can use other variables, especially macroeconomic variables outside the variables used in this study.

2. For academics, the sample of this research is only limited to companies in the telecommunications sub-sector, so it is not necessarily generalizable to other sectors and subsectors. It is suggested that further research should be extended to companies in other sectors or subsectors.

3. For investors, in determining the choice of investing in shares in telecommunications sub-sector companies in Indonesia, do not only refer to the influence of macroeconomic factors but other factors outside the scope of the economy.

4. For the Government, in order to stabilize the rupiah exchange rate (Kur) so as not to open it up to speculators who divert their investment from the capital market by saving dollars which can disrupt capital market activities

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