CHAPTER III

RESEARCH METHODOLOGY

A. Research Variable and Data Type

This research aims to examine the effect of export, foreign direct investment and labor (independent variable) to the Economic Growth in Indonesia using the Gross Domestic Product (GDP) (dependent variable). Based on how to obtain the data, the type of data in this research are secondary annual time series data starting from 2000 until 2016 from Central Bureau of Statistics (BPS) Indonesia and World Bank data.

B. Data Collecting Method and Sources

In this research, the data collection method used is the documentation method. Documentation method is a method of data collection carried out by reading books, literature, journals, references relating to this research and previous research related to the research being conducted. The researcher used a quantitative approach in which the data in the form of numbers. The type of data in use is secondary data. Secondary data is data obtained through other parties, not directly obtained by researcher from the research subject. In this research, secondary data is obtained from BPS and World Bank. This following table show the data and its source:

TABLE 3.1
Variable and Data Source

No	Variables	Source
1	Gross Domestic Product (GDP)	World Bank from 2000-2016
2	Export	BPS from 2000-2016
3	Foreign Direct Investment	BPS from 2000-2016
4	Labor	BPS from 2000-2016

C. Operational Definition of Researched Variables

Variable is a research object or what is the focus of the research (Arikunto, 2010). The definition of research variable is used to prevent errors in analyzing the data.

The dependent variable is variable that affected or which become due to the independent variable. While independent variable is a variable that affects dependent variable (Sugiyono, 2013). This research uses four variables, the details are three variables as independent and one variable as the dependent. The dependent variable in this research is Gross Domestic Product (GDP). While independent variable in this research is Export, Foreign Direct Investment and Labor. The definitions of each variable are desribed as follows:

1. Economic Growth

Economic growth is a process of increasing per capita output in the long run, where the emphasis is on three things: process, output per capita and long term. The economic growth variable used is GDP as the most appropriate measure. The purpose of GDP is to summarize the economic activity in a certain value of money over a period of time. In this research, the variable GDP in Indonesia is a dependent variable and the data of GDP uses

percent unit. In this case, the GDP in Indonesia from annual data, from 2000-2016. Data source were obtained from the website of the World Bank. The following is how to calculate economic growth (Sukirno S. , 2006):

$$Economic\ Growth\ Rate\ (\Delta Y) = \frac{PDB_t - PDB_{t-1}}{PDB_{t-1}} x100$$

Description:

ΔY = Economic Growth Rate on the basis of changes in GDP (%)

GDP_t : Gross Domestic Product value on t year

PDB_{t-1} : Gross Domestic Product value on previous year

To calculate real GDP we must first calculate the GDP deflator. The GDP deflator is the ratio of nominal GDP in a given year to real GDP and is a measure of inflation from the period of the base price to calculate real GDP used until the present period (Dornbusch, Rudiger and Stanley Fischer, 1993). Formula of GDP Deflator:

$$\text{GDP Deflator} = \frac{GDP\ Nominal}{GDP\ Riil}$$

And the formula for Real GDP:

$$\text{Real GDP} = \frac{GDP\ Nominal}{GDP\ Deflator} \text{ x } 100$$

The real GDP used as the independent variable in this research is GDP real Indonesia. Real Indonesian GDP which is a free variable is Indonesia's national income whose data obtained from World Bank in the form of annual data from 2000-2016.

2. Export

Export are the total amount of exports of goods and services originating domestically sold or used by residents abroad. Therefore, exports are an addition to income as well as investment. In this research, the export value is a independent variable and the export uses million US $ unit. In this case, the Export in Indonesia uses annual data from 2000-2016. Data source were obtained from the website of the Central Bureau of Statistics (BPS).

3. Foreign Direct Investment (FDI)

Foreign direct investment is an investment made by a foreign private entity to a particular country. The foreign investment in question is a foreign investment approved by the government by sector amounting to millions of dollars. In this research, the foreign direct investment is a independent variable and the foreign direct investment uses million US $ unit. In this case, the Foreign Direct Investment in Indonesia uses annual data from 2000-2016. Data source were obtained from the website of the Central Bureau of Statistics (BPS).

4. Labor

Manpower is the majority of the population in working age (aged 15 years or over) who have the potential to produce goods and services. So, labor is a part of the number of people who are 15 years or older who have worked. In this case, the labor in Indonesia uses annual data from 2000-2016. Data source were obtained from the website of the Central Bureau of Statistics (BPS).

D. Research Model and Analysis Method

1. Multiple Linear Regression Method

The analysis method in this research is Multiple Linear Regression method. By using descriptive quantitative approach. Multiple Linear Regression Method is used to determine the influence of independent variable such as export, foreign direct investment and labor to the dependent variable Economic Growth. Multiple Linear Regression (MLR) is a statistical technique that use multiple variables. The goal of Multiple Linear Regression (MLR) is to model the relationship between the explanatory and response variables. Regression analysis is one of the technique of data analysis. The statistical often used examine the relationship between several variables and predict variable (Kutner, 2004). This research uses this following multiple linear regression model:

$$Y = \beta + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4x4 + E$$

I = 1,...,...,n

Description:

Y : Gross Domestic Product (GDP)

β0 : Constanta

β1, β2 : Regression Coefficient

X1 : Export

X2 : Foreign Direct Investment (FDI)

X3 : Labor

E : Error Term

According to Gujarati (2003) assumptions on multiple linear regression models are as follows the variance of error is constant (heteroscedasticity), there is no multicollinearity in the independent variable, the average value of the error is zero, the regression model is linear in the parameter, and error normally distributed.

2. Regression Analysis

Linear regression analysis is a statistical technique to model and investigate the effect of one variable (Independent variables) on a variable response (dependent variable) (Basuki A. T., 2016).

a. Coefficient of Determination (R-Squared)

R square test is a value that show how much the independent variable will explain the dependent variable, R^2 in the regression equation is susceptible to the addition of independent variables, where more independent variables are involved then the value of R^2 will be greater because that is the use of R^2 adjusted on multiple linear regression analysis (Basuki, 2016).

If the value of coefficient of determination = 0 (Adjusted $R^2 = 0$), meaning that variation of variabel Y can not be explained by variable X, while if $R^2 = 1$, it means variation of variable Y as a whole can be explained by variable X, while if $R^2 = 1$, it means variation of variable Y as a whole can be explained by variable X. In other words If Adjusted R^2 approaches 1, then the independent variable will be able to explain the

change variant of the dependent variable, and if Adjusted R2 approaches 0, then the independent variable is unable to explain the dependent variable.

b. F-Test

F-test in multiple linear regression analysis aims to determine the effect of independent variables simultaneously at a significant level of 0.05 (5%) (Basuki, 2016). Testing all coefficients of regression are jointly done with the f test with the test as follows:

The test performance as follows:

Ho: The independent variable simultaneously has no effect on the dependent variable.

Ha: Independent variables simultaneously affect the dependent variable.

Ho accepted if the level of significance > 0.05(5%)

Ha is accepted if the level of significance < 0.05(5%)

c. T-Test

T-Test is used to determine the influence of each independent variable partially. T-Test basically shows how far the influence of the independent variables in explaining the dependent variable (Ghozali, 2009).

The significance of independent variables to dependent variables can be seen from Sig value. At the 0.05 (5%) significance level assuming the independent variable has a constant value.

Hypothesis:

If the probability βi > 0.05 Not significant.

If the probability βi < 0.05 Significant.

3. Classical Assumption Test

Classical assumption test aims to determine whether the regression model in use really shows a significant relationship. The classical assumption test used in this research consisted of multicollinearity test, normality test, autocorrelation test and heteroscedasticity test.

a. Multicolinearity Test

Multicollinearity is a linear relationship between the free change of X in multiple regression models (Basuki, 2016). The Multicollinearity test is used to detect any relationship between some or all independent variables. Multicollinearity is a state in which one or more independent variables are expressed as linear conditions with another variable. It means that if among the free variables that are used in no way correlation with each other then can say no multicollinearity occurs.

Multicollinearity detection can be done by looking at the value of pairwise correlation coefficient between two regression. Coefficients with values less than 0.8 indicate that does not show multicollinearity. The results of these tests can be seen also from the Variance Inflation Factor (VIF) by the equation VIF= 1/tolerance. If VIF is less than 10 then there is no multicollinearity (Basuki, 2016).

a. Normality Test

This normality test aims to test whether, in the regression model of the dependent variable, the independent variable or both are normally distributed or not. A good model is that which has a normal data distribution. The residual value is said to be normally distributed when most of the residual value approaches the average.

Normality can be tested with some test one of them with Jarque-Bera (JB Test). This test is done by looking at the magnitude of Jarque Bera probability. Winarno (2015) Normally distributed regression model has Jarque-Bera probability value > 5%. On the other hand, if Jarque-Bera probability value < 5% then data can be sure not to have a normal distribution.

b. Heteroscedasticity Test

Heteroscedasticity is a detection to see if the interference variable is not constant. The heteroskedasticity test aims to test whether in the regression model there is a variance inequality of the residual one observation to another fixed observation, it is called homoskedasticity and if the variance is not constant or changing it is called heteroscedasticity. There are several heteroscedasticity test methods owned by EViews, such as: Breusch-Pagan-Godfrey, Harvey, Glejser, ARCH, White. This research used the *White* method in testing heteroscedasticity.

If the probability value of Obs*R-squared > 0.05 then the model there is no heteroscedasticity. Whereas if the probability value of Obs*R-squared < 0.05 then the model there is heteroscedasticity.

c. Autocorrelation Test

Autocorrelation test is used to find out whether or not the deviation of classical assumption, autocorrelation is the correlation between the residuals in an observation with other observations on the regression model. Autocorrelation is a condition where there has been a correlation this year's residual with the error rate of the previous year, to know the presence or absence of an autocorrelation disease in a model, can be seen from the Durbin-Watson statistic score or with the Breusch-Godfrey Test.

To see whether or not an autocorrelation disease can be used the Lagrange Multiplie Test (LM test) or the so-called Breusch-Godfrey test by comparing the probability R-Squared value with α =5% (0.05), if the probability value of Obs*R-Squared more than 0.05 it can be concluded that there is no autocorrelation. While if probability value of Obs*R-Squared less than 0.05 it can be concluded that there is autocorrelation.

Hypothesis:

If the probability Obs R > 0.05 Not significant.

If the probability Obs R < 0.05 Significant.