CHAPTER III
DATA AND RESEARCH METODOLOGY

A. Research Object

This study uses quantitative methods, derived from numerical data to be processed into information. So the quantitative method is a method that is numerical and statistical analysis and then processed into information. In quantitative research there are two variables that function as model, independent variable and dependent variable. In this study there are 4 variables to be used, one dependent variable, and 3 independent variables. Dependent variable is gross domestic product (GDP), while independent variable is, foreign direct investment, export and import.

B. Type Of Data

This research used secondary data annually in time series data. The observation periode is from 1985-2016. The data that used in this study are as follows :

1. The data of Indonesia gross domestic product (GDP) current US$ which is collected form world Bank Publication 2018.

2. The data of Indonesia Foreign direct investment in this research using the net inflows in current US$ which is collected from world Bank Publication 2018.

3. The data of export in this research using the net inflows in current US$ which is collected from world Bank Publication 2018.

4. The data of import in this research using the net inflows in current US$ which is collected from world Bank Publication 2018.

C. **Data Collection Technique**

The required data are collected by downloading from various sites relevant to the suitability of data requirements, recording or copying data from various related literature studies.

D. **Definition of Operational Variable**

Variable is defined as everything that will be the object of research observation. The definition that is something to be targeted, that is variable. So the variable is a phenomenon that is the center of attention and to be observed or measured.

1. Gross Domestic Product.

In a country's economy there is an indicator used to assess whether the economy is going well or badly. The indicator in assessing the economy must be used to determine the total income earned by all people in the economy. The right and appropriate indicator in making these measurements is the Gross Domestic Product (GDP). GDP can be interpreted that the amount of production of either goods or services that have been produced by the production unit in an area at a given time. Thus, GDP can be used as a measure of a country's economic growth. to measure the total value of production where the total amount is produced by all

people or companies both owned by local or foreigners in a country (Mankiw, 2006).

And the formula for GDP is **GDP=C+I+G(X-M).**

Where C for cosumption, I for investment, G for governement expenditure, X for export and M for import.

2. Foreign Direct Investment

   Interntional capital flows are a form of foreign direct investment (Hady, 2004). An increasingly globalized economy that can not be avoided by countries that have an open system like Indonesia, Foreign direct investment is one of its characteristics. Foreign direct investment begins when a company from one country invests in its long-term capital to a company in another country. In this way (home country) can control the company in the country of investment destination (host country) either partly or completely.

3. Export

   Export is the sale of goods from overseas by following the applicable provisions, especially regarding customs regulation, this exporting activities must obtain special permission from the Directorate General of Foreign Trade. Export activities make domestic products compete overseas. Direct export will give effect to the national income, but the increase of national income does not necessarily affect the export, because the national

income can change due to the increase of household expenditure, corporate investment, government expenditure and imported goods replenishment with domestic assistance (Sukirno, 2008).

4. Import

Import is defined as the import of goods or purchases of goods from abroad into the country. Import can also be interpreted as international trade by entering goods from outside Indonesia by meeting the requirements and applicable provisions (Hutabarat, 1996).

E. Data Quality Test

This research is using multiple linear regression analysis ordinary least square method to analyze data and model in this research. The analysis of multiple linear regression is a linear relationship between two independent variables or more ($X1,X2,….Xn$) with the dependent variable denoted as (Y). The objective of this analysis is to determine the direction of a relationship between independent variable and dependent variable. The direction means whether each independent variables have positive or negative correlation toward dependent variable and to estimate the value of dependent variable if the decreasing or increasing occur. As the objective of this analysis method, multiple linear regression is used to determine the influence of foreign direct investment, export and import on economic growth.

According to Ghozali (2013) regression analysis in addition to measuring the strength of the relationship between two or more variables, it also shows the direction of the relationship between the dependent variable with the independent variable. The dependent variable is assumed to be random/stochastic, which means it has a probabilistic distribution. Independent variables are assumed to have a fixed value (in repeated samplers). The technique of estimating the dependent variable underlying the regression analysis is called Ordinary Least Squares. The OLS methode was first introduced by Carl Friedrich Gauss, a mathematician from Germany. The essence of the OLS method is to estimate a regression line by minimizing the sum of the squares of errors of each observation against the line.

To test the hypothesis in this study, conducted three tests namely:

1. Significance Test of Individual Parameters (Test statistic t)

The statistical t test is used to show how far the influence of one independent variable individually in explaining the variation of the dependent variable. The hypothesis testing is formulated as follows (Ghozali, 2011):

H0: An independent variable is not a significant explanation of the dependent variable.

H1: The variable is a significant explanation of the dependent variable.

How to test t: If P value <0,05 then H0 is rejected and if P value> 0,05 then H0 accepted.

2. Simultaneous Regression Model Testing (F test)

The F statistic test is used to indicate whether all independent or independent variables included in the model have a mutual influence on the dependent variable. The test hypothesis using F test is used formula (Ghozali, 2011):

H0: All independent variables are not a significant explanation of the dependent variable.

H1: all independent variables are simultaneously a significant explanation of the dependent variable.

In the decision-making used criteria as follows:

If P value <0,05 then H0 is rejected and if P value> 0,05 then H0 is accepted.

3. Coefficient of Determination Test

The coefficient of determination is used to measure how far the ability of the model in explaining the variation of the dependent variable. The coefficient of determination is between zero and one. A small determinant value indicates that the ability of the independent variables to explain the variation of the dependent variable is very limited. A value close to one means the independent variables provide almost all the information needed to predict the variation of the dependent variable. (Ghozali, 2011).

F. Classical Assumption

Classical assumption test is used to see the short-term stability of the results of research processing. Tests for violations of these classical assumptions include multicollinearity, heteroscedasticity, autocorrelation and normality tests.

1. Multicollinearity Test

Multicollinearity test aims to test whether the regression model found a correlation between independent variables. A good regression model should not be correlated between independent variables (Ghozali, 2011).

If tolerance value> 0.1 and VIF <10, it can be concluded that there is no symptom of multicolinearity between independent variables in the regression model. If tolerance value <0.1 and VIF> 10, then it can be concluded there are symptoms multikolinearitas between independent variables on the regression model.

1. Heteroskedasticity Test

The heteroskedasticity test aims to test whether in the regression model there is a variance inequality of the residual one observation to another observation. If the variance of the residuals of one other observation remains, then it is called Homoscedasticity and if different is called Heteroskedasticity. (Ghozali, 2011)

H0: Homoskedasticity

H1: Heteroscedasticity

2. Auto Correllation Test

Auto correlation is defined as the correlation between members of a series of observations sorted by space and time (Gujarati, 2003). Auto correlation indicates a correlation between members of a series of observations. If the model has a correlation, the estimated parameter becomes biased and the variation is no longer the minimum and the model becomes inefficient (Basuki, 2015). Basuki (2015) explains that to know whether there is autocorrelation in the model used Lagrange Multiplier test (LM). LM testing procedure is if the value of Obs * R-Squared is smaller than the value of the table then the model can be said to contain no auto correlation. It can also be seen from the probability of chisquares, if the probability value is greater than the value of α selected then there is no auto correlation problem. While the way to overcome the autocorrelation is to add Auto Regressive (AR) variable.

3. Normality Test

The normality test is performed to check whether the error term approaches the normal distribution or not. If this assumption is not met then the test procedure using t-statistic becomes invalid.

The error term normality test is a Jarque-Bera test whose test is based on error and least squares estimator. The test procedure is:

H0 = Error term is normally distributed

H1 = Error term not normally distributed

If the probability Obs*R-squared is greater than the real level then the error term is normally distributed.