CHAPTER III

DATA AND RESEARCH METHODOLOGY

A. Research Object

In this study, the data used are quantitative data. The quantitative data are numeric data (Lukman in Syaharani, 2007). This study used a literature study on the effects of foreign debt, Foreign Direct Investment (FDI), bank credit and labor force on economic growth in Indonesia. This study used a time series study of the years 1985-2013.

Variables used in the study consisted of four variables consisting of one dependent variable (Dependent Variable) and four independent variables

B. Data Type

This study uses secondary data time series in the form of annual data with an observation period from the 1985-2013. The data used in this study are as follows:

1. Data on economic growth rate used is Gross Domestic Product (GDP) in constant prices year 2000 in Indonesia, based on the data obtained from BPS publications.
2. The data on Foreign Direct Investment (FDI) was obtained from the published reports of Indonesia's balance of payments issued by Bank Indonesia (BI) and the Investment Coordinating Board (BKPM).
3. The data of Labor Force are based on data obtained from BPS publications.
4. The data on the foreign debt is obtained by the government and the private sector of Indonesia's foreign debt statistics published by Bank Indonesia (BI).
5. The data of bank credit obtained from the publication of Bank Indonesia (BI).

C. Data Collection Techniques

The technique of determining the data is judgment sampling. Judgment sampling is one type of purposive sampling in addition to quota

some of the characteristics of the samples that were adjusted for the purpose of research. (Kuncoro, 2009).

The data used in this research is the study documentation, ie by collecting, recording and calculating data obtained and associated with this study. The data are obtained from the publication Central Statistics Agency (BPS), the Investment Coordinating Board (BKPM) and Bank Indonesia (BI).

D. Operational Definition of Research Variable

The operational definition is used in order to avoid mistakes in interpreting the data. The operational definition of the variables used in this study is:

1. Economic growth is the growth in the total output produced by a country from year to year that is seen through the growth rate of Gross Domestic Product (GDP) based on constant prices in 2000.
2. Foreign Direct Investment (FDI) is an investment activity to conduct business in the territory of the Republic of Indonesia by foreign investors.
3. The labor force is a productive population aged 15-64 years who had a job, but temporarily not working, or they are actively looking for work.
4. Foreign debt is a loan / debt which is a source of financing coming from abroad both bilateral and multilateral, both government and private, in the form of postal gross withdrawal of foreign loans.
5. Bank credit is the entire financing provided by banks either conventional

E. Hypothesis Testing and Data Analysis

The method used in this study is the approach of Error Correction Model (ECM), because this model is able to test whether the empirical model isconsistent with economic theory and in the solution of the time series variables are not stationary and spurious regression (Thomas, 1997). Spurious regression is chaotic regression, with a significant result regression of the data that is not related.

Error Correction Model (ECM) is a model used to see the effect of long-term and short-term of each of the independent variables to the variables bound. According to Sargan, Engle and Granger, Error Correction Model (ECM) is a technique for correcting short-term imbalance towards a long-term equilibrium, and can explain the relationship between the variables bound by the independent variables in the present and the past.

Error Correction Model (ECM) is applied in the analysis of time series data due to the ability of the ECM in covering a lot of variables to analyze the phenomenon of long-term economic and empirical models to assess the consistency of econometric theory, as well as the have to find solutions to the problem of time series variables which are not stationary and spurious regression in econometric analysis (Knight, 2004).

In determining the linear regression model approach through Error Correction Model (ECM), there are several assumptions that must be met as

1. Stationary Test

Before estimating the time series data stationary test must be conducted. Estimation of non-stationary data will lead to the onset of super inconsistencies of regression and spurious regression, so actually a classic inference method cannot be applied (Gujarati, 1995).

The method recently used by a lot of econometrics to test the stationary problem is the data unit root test. The first unit root test was developed by Dickey-Fuller unit root test and known as the Dickey-Fuller (DF). The basic idea of data stationary test by the unit root test can be explained through the following models):

$$Y_t = \rho Y_{t-1} + e_t \qquad -1 \leq \rho \leq 1 \qquad (3.1)$$

Where e_t is a random disturbance variable or stochastic with mean zero, constant variance and uncorrelated (nonautokorelasi) as OLS. The disturbance variable that has that nature is called the white noise disturbance variables (Widarjono: 2013)

If the value of $\rho = 1$ then we say that the random variable or (stochastic) Y has a unit root. If the time series data have a unit root, then the data are said to be moving at random and the data is said to have the

To test whether the data contain unit roots or not, Dickey Fuller regression models suggest to do the following:

$$\Delta Y_t = \phi Y_{t-1} + e_t \quad (3.2)$$

$$\Delta Y_t = \beta_1 + \phi Y_{t-1} + e_t \quad (3.3)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \phi Y_{t-1} + e_t \quad (3.4)$$

Where t is the time variable.

In the model, if the time series contains a unit root, which means no stationary so nul hypothesis is $\phi = 0$, while the alternative hypothesis is $\phi < 0$ which indicates the data stationary.

DF test in equation (3.2) and (3.4) is a simple model and can only be done if the time series data simply follow the pattern of the AR (1). For time series data that contain a higher AR where the assumption of no autocorrelation is not met, the Dickey Fuller developed a unit root test that incorporates elements of the higher AR and adds a variable lags differentiation in the right side of the equation. This test is known as Augmented Dickey Fuller (ADF) with the following formulation:

$$\Delta Y_t = \gamma Y_{t-1} + \sum_{i-2}^{\rho} \beta_i \Delta Y_{t-i+1} + e_t \quad (3.5)$$

$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \sum_{i-2}^{\rho} \beta_i \Delta Y_{t-i+1} + e_t \quad (3.6)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + \sum_{i-2}^{\rho} \beta_i \Delta Y_{t-i+1} + e_t \quad (3.7)$$

Where: Y = observed variables

ΔYt = Yt - Yt-1

T = time trend

To determine the stationary of data, the comparison between the values of the ADF statistic with the critical value is a statistical distribution τ. ADF statistic value indicated by the value of t statistic coefficient ϕ Y_{t-1}. If the absolute value of the ADF statistic is greater than the critical value, then indicates reject the null hypothesis that means the data is stationary. Conversely, if the absolute value of the ADF is smaller than the critical value, it indicates the data are not stationary (Indira, 2011).

2. Integration Degree Test

Integration degree test is a continuation of the unit root test. If after testing the unit root turns out the data is not stationary, then they are re-tested using the first difference value data. If the data have not been stationary first difference then we tested with data from both the differences and so on until the data is stationary (Gujarati, 1999).

3. Cointegration Test

If all the variables pass from the unit root test, the cointegration test is then performed to determine the likelihood of long-term equilibrium or stability among the observed variables. In this study the method used to test the Engel and Granger cointegration variables is by making the DF-ADF statistic test to see if the cointegration regression residuals were

regression equation was formed first by the method of ordinary least squares (OLS). Regression equation which will be tested in this study were as proposed by (Nachrowi, 2006).

$$LnY_t = \beta_0 + \beta 1 LnFDIt + \beta 2 LnEDt + \beta 3 LnCREt + \beta 4 LnLFt + et \quad (3.8)$$

Description:

β0 = intercept / constant

β1, β2, β3 = regression coefficient

LnYt = gross domestic product in period t

LnFDI = Foreign Investment in period t

LnEDt = Foreign Debt in period t

LnLFt = Labor Force in period t

LnCREt = Bank lending period t

et = error term

The regression equation above was used to obtain residual value. Then the residual value (et) were tested using the Augmented Dickey Fuller to see if the residual value is stationary or not. The residual value is said stationary if the absolute value of ADF count is smaller or larger than the absolute critical value of Mc Kinnon at α = 1%, 5%, or 10%, and it can be said that regression is cointegrated regression. In econometric variables, they are said to be mutually cointegrated in the long-term

will be developed. Thus, by using the model above the interpretation would not be misleading, especially for long-term analysis.

4. Error Correction Model (ECM) Analysis

A technique for correcting imbalances in the short term to the long-term equilibrium is called Error Correction Model (ECM). This method is a single regression connecting the first differentiation in the dependent variable (ΔY_t) and the first differentiation for all independent variables in the model. This method was developed by Engel and Granger in 1987. The general form of the ECM method (Nachrowi: 2006) are as follows:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta X_{1t} + \beta_2 \Delta X_{2t} + \beta_3 \Delta X_{3t} + \beta_4 u_{t-1} + et \quad (3.9)$$

To find the model specification with a model ECM which is valid, it can be seen in the results of statistical tests on the coefficients of the regression residuals β_4 or first, which would then be called Error Correction Term (ECT). If the results of the ECT coefficient test is significant, then the observed model specification is valid. In this study,

$Y_t = f\,(LnFDI_t,\ LnED_t,\ LnAK_t, LnKREt,\ ECTt_{-1})$ (3.10)

$$\Delta Ln\ Y_t = \beta_0 + \beta_1 \Delta\ LnFDI_t + \beta_2 \Delta\ LnED_t + \beta_2 \Delta\ LnLF_t + \beta_3 \Delta\ LnCRE_t + \beta_4\ ECT_{t-1} + et \quad (3.11)$$

Description:

LnYt = Gross domestic product in period t

LnFDI = Foreign Investment in period t

LnEDt = Foreign Debt in period t

LnLFt = Labor Force in period t

LnCREt = Bank lending period t

ECT $_{t-1}$ = error correction term in the previous period

Based on the calculations of linear regression analysis of the ECM above, it can be seen that the value of the variable ECT (error correction term), which is a variable that indicates the balance of the investment. It can make an indicator that the model specification, whether or not through significance level of error correction coefficient (Revelation Wing, 2007). If the ECT variable α = significance at 5%, then the coefficient will be an adjustment in the event of fluctuations of observed variables which deviate from the long-term relationship. In other words, the model

CHAPTER IV

OVERVIEW

A. An Overview of Indonesian Economic Growth

Economic growth is one measure of the results of the construction carried out, especially in economics. The growth is a picture of the level of economic developmen. Economic growth in detail from year to year is presented by the gross domestic product (GDP). If there is positive growth, is indicates an increase in the economy compared with last year. Conversely, when the economy showed a decline compared to last year.

During the study period of 1985-2013 Indonesia's GDP has increased an average of 5.10 percent annually. The highest increase in GDP occurred in 1995 which reached 8.22 percent, and the lowest was in 1998 which decreased 13.13