CHAPTER III

RESEARCH METHOD

3.1. Type of Study

This research aimed to analyze the impact of world crude oil price fluctuation in international market on Indonesia's economy quarterly in 2005-2015. By using quantitative research with time series data and VAR model, this research analyzed "The Impact of World Crude Oil Price Fluctuation on Indonesia's Macroeconomy (Balance of Payment (BOP), Gross Domestic Product (GDP), and Inflation)".

3.2. Research Variables

In this research, there were several variables included such as world crude oil price fluctuation, gross domestic product (GDP), balance of payment (BOP), and inflation.

3.2.1. Gross Domestic Product (GDP) (Y1) as the Dependent Variable

Gross Domestic Product (GDP) is a representation of the total value of sales of all goods and services produced within a certain period of time. Briefly, GDP means everything that is produced by society and business, including the salaries of workers. GDP data is also a way to find out which sectors of the economy experiencing growth or decline.

In United States (US), GDP is calculated and announced quarterly by the Bureau of Economic Analysis (BEA), which is part of the US Department of Commerce. BEA often revises estimates whether it is up or down during the development of data received throughout the quarter. Usually, the GDP announced comparation of previous quarter or year. For example, if GDP in the second quarter increases three percent, it means that the country's economy has grown by three percent throughout the first quarter.

3.2.2. Balance of Payment (BOP) (Y2) as the Dependent Variable

Balance of Payment (BOP) is a statistic that records every economy transaction between the resident and non-resident in certain periods. Balance of payment transaction including current transaction, capital transaction, and financial transaction.

Meanwhile, the International Investment Position of Indonesia (PIII) is a statistic that shows the value of asset and financial obligations of Indonesia on non-residents in certain periods. Financial asset can be an invoice on the non-residents or gold owned as part of foreign exchange reserves.

3.2.3. Inflation (Y3) as the Dependent Variable

Inflation is the increasing of price in general and continuously in a certain period. The price increases from one or two goods cannot only be called inflation

except the increase extends (or results in a price increase) in other goods. The indicator that is often used to measure the inflation rate is Consumer Index Price (CPI). Changes in CPI from time to time shows the price movement of the package of goods and services consumed by the public.

The determination of goods and services in the CPI basket is carried out on the basis of the Cost of Living Survey *(Survei Biaya Hidup)* that is conducted by *Badan Pusat Statistik* (BPS). BPS will monitor the development of prices of these goods and services on a monthly basis in several cities, in traditional and modern markets for several types of goods or services in each city.

3.2.4. World Crude Oil Price Fluctuations (X) as the Independent Variable

World crude oil price fluctuation means that the oil price is uncertain or there is a shock in the oil price. World crude oil price fluctuation in international market following the general truth in economy market, the price is determined by demand and supply mechanism as a fundamental factor (Nizar, 2002).

In a demand side, world crude oil price fluctuation is influenced by the world economic growth. The experience shows that the increasing of the demand for oil will increase the oil price preceded with a quite high global economic growth. Before oil shock happened in 1973 and 1978, the global economic growth was high which was more than 4% a year, followed by the high demand of oil with the growth of about 8% and 4% (Kesicki, 2010).

The increasing of oil's demand was because the encouragement of economic growth in 1960's decade until 1973, especially from developed countries that joined in the Organization for Economic Cooperation and Development (OECD). After the second crisis of world crude oil price, the annual average oil consumption grew by more than 1 million barrels per day, except in the early 1990's, where global consumption was stagnant due to the collapse of the Soviet Union.

In supply side, the world crude oil price fluctuation is influenced by the availability or supply of oil by producing countries, either a country that joined in Organization of the Petroleum Exporting Countries (OPEC) or non-OPEC producer countries. The availability or supply of oil is strongly related to production capacity, investment capacity, and refinery infrastructure (Kesicki, 2010 and Breitenfellner et al., 2009)

3.3. Analysis Technique

3.3.1. Stationary Test

Stationary test (unit root test) is done to prove the stability (normality) of the pattern of each variable. Thus, the result of the regression is not spurious (false) and it does not produce a wrong interpretation. Test methods that are often used are Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test.

3.3.2. Optimal Lag Length

Determination of the length of the lag is used to determine the length of the period of a variable to its past variables and to other endogenous variables. Determination of lag in this research used the Likelihood Ratio (LR) approach, Final Prediction Error (FPE), Akaike Information Criterion (SC) and Hannan Quinn (HQ).

1.3.3. Granger's Causality Test

Causality test was conducted to know is endogenous variable can be an exogenous variable too or not. This thing based on the ignorance of influence between variable. For example, if there are 2 variable such as y and x, then, is y influence x or maybe x influence y? It can be both, or maybe they did not have an influence at all.

3.3.4. Estimation VAR Model

VAR model treats all variable symmetrically. One vector contains more than two variables and there will be a lagged value of non-independent variables as a representation of the autoregressive nature of the model (Asteriou and Hall, 2007).

The VAR model that will be used in this research was:

$$y_t = c + \sum_{i=1}^{p} \emptyset_i y_{t-i} + \varepsilon_t$$

Where

Yt (Y1t, Y2t, ..., Ynt) is vector n x 1 from endogeneous variables

Yt-1 is a lag variable with order i

Øi is matrix n x n autoregressive coefficient from vector

Yt-1 for i=1, 2, …, p. c=(c1, c2, … cn) is n x 1 intercept vector from VAR model

εt=(ε1t, ε2t, …, εnt) is n x 1 vector from disturbance