CHAPTER III

DATA AND RESEARCH METHODOLOGY

A. Research Variable and Data Type

This research aims to examine the effect of macroeconomics variable such us inflation, exchange rate, and gross domestic product, (independent variable) to the performance of Islamic Bank in Indonesia using the Return on Assets (ROA) (dependent variable). Based on how to obtain the data, the type of data in this research are secondary monthly time series data starting January 2012 until December 2015 from Badan Pusat Statistik (BPS), Financial service authority (OJK), and Bank Indonesia.

B. Data Collecting Method and Sources

In this study, researchers 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 collected by data collection agencies and published to the user community (Hanke and Reitsch, 1998). Briefly, it can be said that secondary data is data that has been collected by other parties. In this research, secondary data is obtained from Bank Indonesia website. BPS, and Financial Services Authority (OJK).

TABLE 3.1

Variable, and Data Source

No	Variables	Source
1	Return on Assets (ROA)	Shariah Banking Statistics OJK from January 2012 to December 2015
2	Inflation rate	Badan pusat Statistik (BPS) from January 2012 to December 2015
3	Exchange rate	Bank Indonesia from January 2012 to December 2015
4	GDP	Bank Indonesia from January 2012 to December 2015

C. Operational Definitions of Researched Variables

Variable is a research object or what is the focus of the research (Arkinto, 2010). The Definition of research variables 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 (Soegiyono, 2013) This study uses 5 variables, the details are 4 variables as independent and one variable as the dependent. While dependent variable in this research is Return on Assets (ROA), The definitions of each variable are described as follows:

1. **Return on Assets (ROA)** is a profitability ratio. ROA is able to measure the ability of company as impressive gains in the past and then projected in the future. This research ROA is dependent variable and the data ROA uses in percent. Return on asset or sometimes known as return of investment is one main tool to measure the

probability of bank in relation to asset owns by the Bank. ROA gives and ideas as to how efficient management is at using its assets to generate earnings (Investopedia, LLC., 2015). In this research, The Return On Asset (ROA) is the The Return On Asset (ROA) of Islamic Bank in Indonesia from monthly data, from January 2012 until December 2015.The formula of Return On Asset is:

$$\textbf{ROA} = \frac{NetIncome}{TotalAssets} \times 100$$

2. **Inflation** is rising prices of goods in general and continuously. Can not be called inflation when prices of one or two items only unless the lead to increasing the price on other goods.. In this research the variable inflation is a independent variable and the data of inflation uses percent, In this case the Inflation is Inflation in Indonesia from monthly data,from January 2012 until December 2015.
3. **Exchange rate** is defined as the price of one currency in items of another currency or the amount of one currency that can be exchange per unit of another currency. In this research Exchange rate uses thousand rupiah.In this case The Exchange rate in Indonesia from monthly data, from January 2012 until December 2015.
4. **Gross domestic product** is one important indicator to know the economic condition in a country in a certain period is the data of gross domestic product (GDP), GDP over the constant price shows the added value of goods and services are calculated using credit interest rates.

Meanwhile, in the case of sharia banks, the decline that occurs can actually make the profit-sharing ratio to compete with conventional bank loans because the financing in the sharia bank is not directly affected by the declining SBI rate.

D. Research Model and analysis Method

1. Multiple Linear Regression methods

The analysis method in this research is Multiple Linear Regression methods. By using descriptive quantitative approach. Multiple Linear Regression Methods is used to determine the influence of independent variable such us inflation, exchange rate, and gross domestic product to the dependent variable Return On Asset (ROA). Multiple Linear Regression (MLR) is a statistical technique that uses 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 (M.H. Kutner, 2014). This study uses this following multiple linear regression model :

$$Y = \beta + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + E$$

I = 1,…,…,n

Description:

Y= Return On Asset (ROA)

β = Constant

X1 = Inflation rate

X2 = Kurs

X3 = Money Supply

X4 = Bi rate

E = Error term

Where Y is the dependent variable, X1,X2,X3 are independent variable and E is the random residual (disturbance) term, β1,β2,β3,β4 are the regression coefficients, and n is the sample size in matrix terms (Neteretal, 1983).

Accordance 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, 2016).

a. Coefficient of Determination (R-Squared)

R square test is a value that show how much the independent variable will explain the variable 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 variable 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. In other words If Adjusted R2 approaches 1, then the independent variable will be able to explain the change variant of the dependent variable, and if Adjusted R^2 approaches 0, then the independent variable is unable to explain the dependent variable.

According to Basuki (2017), The formula of Coefficient of Determination Test R^2 as follows:

$$R^2 = \frac{ESS}{TSS} = 1 - \frac{\text{RSS}}{\text{TSS}} \quad \text{.....(3,1)}$$

$$= 1 - \frac{(\sum \grave{e}_i^2)}{(\sum y_i^2)} \quad \text{.....(3,2)}$$

$$= 1 - \frac{(\sum \grave{e}_i^2)}{\sum (Y_{i-} Y\prime_i)^2} \quad \text{.....(3,3)}$$

b. 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

c. 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 significance level > 0.05 (5%)

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

3. Classical Assumption

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

a. Multicollinearity 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. This means that if among the free variables that are used in no way correlation with each other then can say no multicollinearity occurs.

Concerning the problem of Multicollinearity, Sumodiningrat (1994: 281-182) suggests that there are three things that need to be discussed first:

1) Multicollinearity is essentially a sample phenomenon. In the population regression function model (PRF) it is assumed that all independent variables included in the model have an individual effect on the dependent variable Y, but it may happen that in a particular sample.
2) Multicollinearity is a matter of degree and not a matter of kind. This means that the problem of Multicollinearity is not a matter of whether the correlation is between the negative or positive free variables, but is a matter of the correlation between the independent variables.
3) The problem of Multicollinearity relates only to the linear relationship between the independent variables that the Multicollinearity problem will not occur in the regression model whose form of the function is non-linear, but the Multicollinearity problem will appear in the

regression model whose form of the function is linearly among the independent variables.

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).

b. Autocorelation Test

Autocorrelation Test is used to find out whether or not the deviation of classical assumptions, autocorrelation is the correlation between residuals in an observation with other observations on the regression model, Autocorrelation is a condition where there has been a correlation between 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 Multiplier Test (LM test) or the so-called Breusch-Godfrey test by comparing the probability R-Squared value with $\alpha = 5\%$ (0.05), if the probability value of Obs * R- Squared more than 0.05 it can be concluded that there is no autocorrelation.

Hypothesis:

If the probability Obs R> 0.05 Not significant

If the probability Obs R2< 0.05 Significant

if the probability value of Obs * R- Squared is more than 0.05 it can be concluded that there is no autocorrelation.

c. Heteroskedasticity Test

Heteroskedasticity arises when the residual error of the observed model does not have a constant variance from one observation to another (Sidik and salaudin: 2009). A good regression model is free of symptoms of heteroscedasticity. Deteksi from heteroscedasticity can be done by White Heteroskedasticity test. If the probability value of Obs * R- Squared is greater than 0.05 then it can be concluded that there are no heteroscedasticity.

d. 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.