CHAPTER IV

RESEARCH METHOD

4.1. Research Method

The research method used in this research is quantitative analysis. The quantitative analysis is a characteristic of variables where the mark is stated on the numerical form. The characteristics of the measurement variable make the mark being placed in an interval.

The writer also gathers data through library research. The data, i,e. theory, etc are taken from books and other references related to the analysis and problems of research.

4.2. Research Subject

This research concentrates on the mutual fund growth in Indonesia. The growth of mutual fund and the factors that affect it become the subject in this thesis.

4.3. Research Setting

The study and research of this thesis take place in Economics Faculty of Islamic University of Indonesia. The writer conducts the research through literature and data analysis available in the Jakarta Stock Exchange Corner,

library and reference room in Economics Faculty of Islamic University of Indonesia.

4.4. Research Instrument

The research instruments utilized in this research are through the literature and data study in the library, reference room, and Jakarta Stock Exchange Corner in Faculty of Economics of Islamic University of Indonesia from where the researcher gathers the data. This research is also supported by observation of phenomena in investing field in Indonesia focused on the growth of mutual fund taken from newspapers, magazines and internet.

4.5. Research Variables

Based on the data used in this research, the variables in this thesis are categorized into two variables; dependent variable and independent variable. Both variables are described as follows:

4.5.1. Dependent variable

The dependent variable in this research is the growth of mutual fund (GMF).

4.5.2. Independent variable

The independent variable in this research consists of four variables, they are:

4.5.2.1. The 3 months interest rate of Bank Indonesia's certificate (R)

4.5.2.2. The value of Indonesia's Gross Domestic Products (GDP)

4.5.2.3. The Exchange Rate of US$ to Rupiah (ER)

4.5.2.4. The number of Mutual Fund Investor (MFI)

4.6. Types and Sources of Data

The data used in this research is secondary data obtained from many sources that are competent with the research. In this research the writer uses quarterly data since 1996:2 – 2003:3.

The writer obtains the data from many sources that are relevant and representative with the research. The sources of data are:

1. Economic Indicator. Weekly report of Badan Pusat Statistik.

2. Indonesian Monetary Economic Statistics. Weekly report of Bank Indonesia.

3. Indonesia Financial Statistics of Bank Indonesia.

4. Official website of Bank Indonesia. http://www.bi.go.id

5. Official website of Bapepam: http://www.bapepam.go.id

6. Supported website that supplies the data needed in this research. That is;

http://cippad.usc.edu/ai/stat_indo/data/Economy/EXCHNG1.xls

4.7. Method of Data Compilation

In order to support this research, the writer gathers the data from many sources by recording them. The first step in gathering data, the writer accesses the official website of Bapepam as an institution that supervises and controls the

capital market. Through this website writer downloads all data related to mutual fund that are needed as variables research. The website provides and fulfills what the writer needs. Meanwhile, to get the data of interest rate of SBI and exchange rate of US Dollar against Rupiah, the writer also downloads them from official website of Bank Indonesia.

Besides, the writer also looks for the rest of supported data for this thesis from many reports published by competent and responsible institution, such as weekly report of Indonesian Monetary Economics Statistics, Indonesia Financial Statistics published by Bank Indonesia, Weekly Report of Economic Indicator published by Badan Pusat Statistik.

The writer integrates those sources that are sourced from both internet and published report in order to get accurate data.

4.8. Technique of Data Analysis

This research uses multiple regression model, which involves the use of more than one independent variable to predict a dependent variable (Hanke and Rietsch, 1995:255). Meanwhile, in determining the parameter of α, the method being used is Ordinary Least Square (OLS). By using this method, it is expected that the Best Linear Unbiased Estimator (BLUE) will be obtained.. Basically, the content of this method is normal determination through minimization of error square.

Function of the Mutual Fund growth in Indonesia can be formed as follows:

$$GMF = f\{R, GDP, ER, MFI\}$$

Where:

GMF   : The Growth of Mutual Fund in Indonesia (Rupiah)

R   : The Interest Rate of Bank Indonesia's Certificates (%)

GDP   : The Value of Indonesia's Gross Domestic Products (Rupiah)

ER   : The Exchange Rate of US$ (Rupiah)

MFI   : The number of Mutual Fund Investor.

Writer uses log linear regression model in this research in the form of the following econometric model:

$$\text{Log GMF} = \beta_0 + \beta_1 \text{Log R} + \beta_2 \text{Log GDP} + \beta_3 \text{Log ER} + \beta_4 \text{Log MFI} + u$$

Where;

β_0 : Constant

$\beta_1,....,\beta_4$: Regression coefficient of each variable.

GMF   : The growth of mutual fund in Indonesia (Rupiah)

R   : The interest rate of Bank Indonesia's Certificates (%)

GDP   : The value of Indonesia's Gross Domestic Products (Rupiah)

ER   : The Exchange Rate of US$ (Rupiah)

MFI   : The number of Mutual Fund Investor.

u : disturbance error

The writer also applies statistical test which include testing about individual partial regression coefficient and testing the overall significance of the sample regression. Beside this statistical test, the writer also analyzes the R^2, classical assumptions that cover multicollinearity, autocorrelation, and heterocedasticity.

4.8.1. T – test

This test is used to detect the correlation between dependent variable and independent variables individually. In this research, the writer uses one tail test since this research has a strong theoretical expectation.

The following hypothesis will be examined individually:

$H_0 : \beta_i = 0$: means that the independent variable individually does not impact on dependent variable.

$H_1 : \beta_i > 0$: means that the independent variable individually impacts positively on dependent variable.

The decision will be made with the parameter (α) 5% based on the following rules:

a. When the value of computed t < t table value, the decision is accepting H_0. In this case the independent variable individually does not impact the dependent variable significantly.

b. When the value of computed t > t table value, the decision is rejecting H_0. In this case the independent variable individually impacts the dependent variable significantly.

4.8.2. F – test

This test is used to detect the correlation between dependent variable and independent variables jointly. The testing of F test is the same as the testing for t test. Hypothesis is formulated as follows:

$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$: hence the independent variables do not affect the dependent variable jointly.

$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$: hence the independent variables affect the dependent variable together.

The decision will be made with the parameter (α) 5% based on the following rules:

a. When the value of computed F < F table value, the decision is accepting H_0. In this case the independent variables jointly do not impact on dependent variable significantly.

b. When the value of computed F > F table value, the decision is rejecting H_0. In this case the independent variables jointly impacts on dependent variable significantly.

4.8.3. Goodness of Fit (R^2)

It is an important property of R^2 that is a nondecreasing function of the number of explanatory variables or regressors present in the model; as the number of regressor increase. R^2 almost invariably increases and never decreases. R^2 is used to detect how far the independent variable influences the dependent variable in the model (Gujarati, 1995: 207). R^2 is being a measure of the goodness of fit of a sample least squares linear regression in a body of data. The number of R^2 is between $0 - 1$. The closer the number of R^2 to 1 the better the model explain about relationship between dependent variable and independent variables.

4.8.4. Classical Assumption

Basically this test is used to know whether the model in this research is a valid model or not. The model is considered a valid model if there is no correlation, autocorrelation, and heterocedasticity in the model.

4.8.4.1. Multicollinearity

Multicollinearity means the existence of a perfect or exact linear relationship among some or all explanatory variables of a regression model (Gujarati, 1995: 320). The consequences of multicollinearity are as follows:

If there is perfect collinearity between the X's, their regressions coefficients are in determine and their standard errors are not defined. If collinearity is high but not perfect, estimation of regression coefficients is possible but their standard errors tend to be large. As a result, the population values of coefficients cannot be estimated precisely. However, if the objective is to estimate linear combination of these coefficients, the *estimable function*, this can be done even in the presence of perfect multicollinearity (Gujarati, 1995: 345).

To detect multicollinearity, the correlation method ca be considered as the best one. The correlation is r < 0.8; it is suspected no multicollinearity and the multicollinearity exists if r > 0.8.

4.8.4.2. Autocorrelation

The term autocorrelation may be defined as correlation between members of series of observations ordered in time (as in time series data) or space (as in cross-sectional data) (Gujarati, 1995: 400). If there is autocorrelation in the model, it will raise the value of residual and the impact is the number of t-test, f-test and R^2 will decline.

The tool of analysis used to detect autocorrelation is using LM test (Lagrange Multiplier Test). This test uses the

level of degree (χ^2) which expresses that there is no autocorrelation, with the guidance if χ^2 statistic is bigger than the value of χ^2 table, hence H_0 is denied and so is in the contrast.

4.8.4.3. Heterocedasticity

It is a situation where there is correlation between independent variables and residual value in the model. To detect the heterocedasticity, the writer uses one of the formal methods; that is Park test. Park formalizes the graphical method by suggesting that σ^2_i is some function of the explanatory variable X_i. The functional form he suggested was:

$$\sigma_i^2 = \sigma^2 X_i^\beta e^{v_i}$$

$$\ln \sigma_i^2 = \ln \sigma^2 \beta \ln X_i + v_i \qquad (3.7.4.2.a)$$

in which v_i is the stochastic disturbance term.

Since σ_i^2 is generally not known, Park suggests using u_i^2 as a proxy and running the following regression:

$$\ln u_i^2 = \ln \sigma^2 + \beta \ln X_i + v_i$$

$$= \alpha + \beta \ln X_i + v_i \qquad (3.7.4.2.b)$$

If β turns out to be statistically significant, it would suggest that heterocedasticity is present in the data. If it turns out to be insignificant, we may accept the assumption of

homoscedasticity. The Park test is thus a two-stage procedure. In the first stage run the OLS regression disregarding the heterocedasticity question. It is obtained u_i^2 from this regression, and then in the second stage run the regression (3.7.4.2.b).