

## CHAPTER III

### DATA AND RESEARCH METHODOLOGY

#### A. Data Collecting Method and Sources

This research aims to examine the effect of macroeconomic variables, FTSE Malaysia and gold price on Jakarta Islamic Index (JII) performance. This study employs secondary data on monthly basis starting from October 2013 until March 2016 taken from various sources. The following table represents the data variables and its sources.

**TABLE 3.1**

Data and Sources

No	Variables	Sources
1	Jakarta Islamic Index	Fusion Media.Ltd
2	Exchange Rate	University of British Columbia
3	Brent Oil Price	U.S Energy Information Administration
4	FTSE	Fusion Media.Ltd
5	Gold Price	World Gold Council

This study also applies other relevant sources such as; journal, articles, books and website to enrich the information.

#### B. Econometric Model

##### 1. Model 1

$$JII_t = A_0 + A_1JII_{t-1} + A_2ER_{t-1} + A_3O_{t-1} + A_4FTSE_{t-1} + A_5G_{t-1} + e_t$$

2. Model 2

$$ER_t = A_0 + A_1 JII_{t-1} + A_2 ER_{t-1} + A_3 O_{t-1} + A_4 FTSE_{t-1} + A_5 G_{t-1} + e_t$$

3. Model 3

$$O_t = A_0 + A_1 JII_{t-1} + A_2 ER_{t-1} + A_3 O_{t-1} + A_4 FTSE_{t-1} + A_5 G_{t-1} + e_t$$

4. Model 4

$$FTSE_t = A_0 + A_1 JII_{t-1} + A_2 ER_{t-1} + A_3 O_{t-1} + A_4 FTSE_{t-1} + A_5 G_{t-1} + e_t$$

5. Model 5

$$G_t = A_0 + A_1 JII_{t-1} + A_2 ER_{t-1} + A_3 O_{t-1} + A_4 FTSE_{t-1} + A_5 G_{t-1} + e_t$$

Where JII is Jakarta Islamic Index, ER is exchange rate, O is oil price, FTSE is FTSE Malaysia, G is gold price, and  $e_t$  is error term ( $t = 1, 2, 3, 4, 5, 6$ ),  $l$  is lag length with  $t = 1, 2, \dots, x$  and  $x$  is maximum lag.

### C. Operational Definition

#### 1. Dependent Variable.

Dependent variable or sometimes being called as *response variable* is the representative of the treatment outcome (Leroy 2011). Jakarta Islamic Index return is the dependent variable that is obtained from the monthly closing price. The return value can be obtained by this equation:

$$R_t = \ln(P_t) - \ln(P_{t-1})$$

Where  $R_t$  defines return of the month,  $P_t$  is closing price of stock for month  $t$ , and  $P_{t-1}$  is closing price for month  $t-1$ .

## **2. Independent Variables.**

### **a. Exchange Rate.**

Exchange rate is that is used in this research is the monthly rate. The exchange rate is stated in USD/RP.

### **b. Oil Price.**

As the International oil price benchmark, Brent Oil Price is used in this research as the representative for oil price. It uses the monthly closing price of Brent Oil.

### **c. FTSE Malaysia.**

This variable is obtained from the monthly closing price of FTSE Malaysia.

### **d. Gold Price.**

Gold price is the representative from commodity market. It uses the monthly closing price of gold price.

## **D. Analysis Method**

The method of analysis that is applied in this study are; Co-Integration test and Vector Error Correction Model (VECM) in order to see the relationship of four independent variables on the dependent variable both in short-run and long run.

In order to get the precise result, there are steps to be done as the standard procedure. The following steps on VECM procedures are: Unit Root Test (Augmented Dickey Fuller Test), Lag Length Criteria, Stability VAR Model Test, Co-integration Test, Vector Error Correction Model

(VECM), Impulse Response Function and Variance Decomposition Test.

The thorough explanation will be explained as follow:

### **1. Unit Root Test.**

Unit root test can be described as an estimation to test stationarity in time series data. A certain equation can be described having stationarity if a movement in time causes no change in the distribution. Unit root test contributes to the non-stationary variable (Andale 2016).

### **2. Lag Length Criteria.**

Lag is an important thing in VAR system. It functions to show how long the reaction from one variable to the other, the optimum lag also functions to erase the autocorrelation in VAR system (Firdaus 2011).

Lag length test can be identified by using *Akaike Information Criterion (AIC)*, *Schwarz Information Criterion (SIC)*, *Hanan-Quinn Criterion (HQ)*, etc.

### **3. Stability VAR Model Test.**

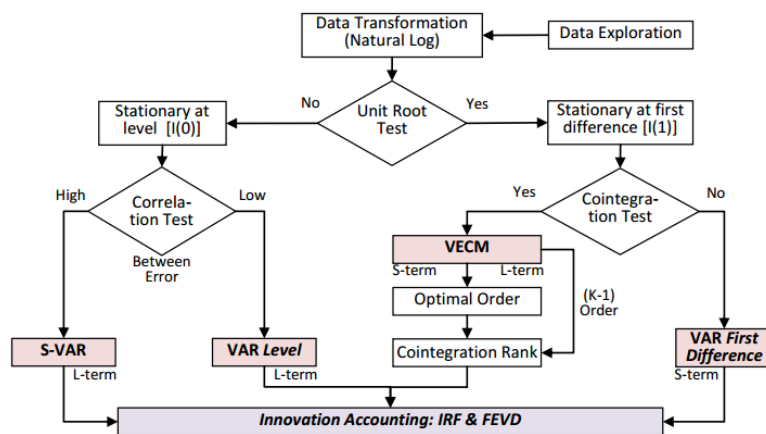
VAR stability test is conducted to estimate the roots of characteristic polynomial. If all the roots of characteristic polynomial within circle, then it passes VAR model, so that the IRF and FEVD valid (Firdaus 2011).

#### 4. Co-Integration Test.

This is the relationship between  $x_t$  and  $y_t$  that are both co-integrated and contains unit root test (Sorensen 2005). Based on Horvath and Watson (1995) the most recognizable way to test the co-integration is by using Johansen method. The estimation on Johansen test functions to estimate the co-integration when two variables or more employ in the data (Dwyer 2015).

#### 5. Vector Error Correction Model (VECM).

VECM specification restricts the long-run endogen variables relationship in order to stay convergent in the co-integration relationship, yet still regard the short-run relationship existence (Basuki and Prawoto 2016). The process to decide VECM method can be seen from the figure below



Source: Gujarati

**FIGURE 3.1**

The VAR/VECM Analysis Process

## **6. Impulse Response Function (IRF).**

IRF can explain the response of one variable to a shock from other variables. So, the influence of shock of one variable because of other variables can be explained clearly. The IRF result shows the length of time needed from one variable to response the others.

## **7. Variance Decomposition.**

Forecast variance decomposition is the prominent tool in interpreting the linear and non-linear multivariate time series models along with the impulse response (Lanne and Nyberg 2014). Variance decomposition aims to estimate each variables contribution because certain changes on the system. This analysis also pictures the independent variables relationship on the VAR system due to the shock (Juanda and Junaidi 2012)

## **E. Research Outlines**

In order to acknowledge and understand the research, this research is divided into a number of chapters respectively. The description will be explained thoroughly as follow.

### **1. Chapter I Introduction.**

This chapter explains the general background, research limitations, research questions, research objectives, and research benefits.

## **2. Chapter II Literature Review.**

This chapter explains the theories regarding investment, Islamic investment, capital market, Islamic capital market, risk and return, stock market index, JII, exchange rate, oil price, FTSE Malaysia, and gold price. Another important thing is explained in this chapter is the previous studies. This chapter concludes the hypothesis and research framework.

## **3. Chapter III Data and Research Methodology.**

This chapter explains the data and methodology, data collecting method and its sources, research model and definitions, operational definition of dependent and independent variables, and analysis method.

## **4. Chapter IV Research Finding and Discussion.**

This chapter explains the overview of macroeconomics variables represent by exchange rate and oil price, FTSE Malaysia, gold price, and Jakarta Islamic Index. In this chapter, there will be the analysis of VECM analysis, the results, the analysis of empirical analysis comparing to the theoretical framework and previous studies.

## **5. Chapter V Conclusion and Recommendation.**

This chapter explains the conclusions and recommendation from the research.

